520_project

Loading and preocessing the data

```r
library(readr)
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(tidyr)
library(lavaan)
```

```
This is lavaan 0.6-18
lavaan is FREE software! Please report any bugs.
```

```r
library(tidyverse)
```

```
-- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
v forcats   1.0.0     v purrr     1.0.2
v ggplot2   3.5.0     v stringr   1.5.1
v lubridate 1.9.3     v tibble    3.2.1
```

```
-- Conflicts ------------------------------------------ tidyverse_conflicts() --
x dplyr::filter() masks stats::filter()
x dplyr::lag()    masks stats::lag()
i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to beco
```

```r
# Load ASD scores from two data samples and add a label column, and remove 'asd' column
goal_df <- read_csv("asd_goal.csv") %>%
  select(-asd) %>%
  mutate(sample_type = "goal")
```

```
Rows: 46 Columns: 67
-- Column specification --------------------------------------------------------
Delimiter: ","
dbl (67): id, asd, Q25_1, Q25_2, Q25_3, Q25_4, Q25_5, Q25_6, Q25_7, Q25_8, Q...

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.
```

```r
event_df <- read_csv("asd_event.csv") %>%
  select(-asd) %>%
  mutate(sample_type = "event")
```

```
Rows: 32 Columns: 67
-- Column specification --------------------------------------------------------
Delimiter: ","
dbl (67): id, asd, Q25_1, Q25_2, Q25_3, Q25_4, Q25_5, Q25_6, Q25_7, Q25_8, Q...

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.
```

```r
# Get item columns (those starting with Q25_)
item_cols <- grep("^Q25_", names(goal_df), value = TRUE)

# Define reverse-coded items (from your earlier list)
items_to_reverse <- c("Q25_3", "Q25_7", "Q25_11", "Q25_12", "Q25_15",
                      "Q25_17", "Q25_21", "Q25_22", "Q25_26", "Q25_32",
                      "Q25_38", "Q25_40", "Q25_43", "Q25_45", "Q25_48")

# Reverse code for both datasets (using column names directly)
```

```r
goal_df[ , items_to_reverse] <- 5 - goal_df[ , items_to_reverse]
event_df[ , items_to_reverse] <- 5 - event_df[ , items_to_reverse]

# Combine the two dataframes after reverse coding
combined_df <- bind_rows(goal_df, event_df)

# Now safely filter only the item columns for valid range (1-4)
data_df <- combined_df %>%
  filter(if_all(all_of(item_cols), ~ !is.na(.) & . != "" & . >= 1 & . <= 4))

# Calculate ASD composite score as the sum of all Q25 items per row
data_df <- data_df %>%
  mutate(asd = rowSums(across(all_of(item_cols))))

# Confirm it now works
head(data_df)
```

```
# A tibble: 6 x 68
     id Q25_1 Q25_2 Q25_3 Q25_4 Q25_5 Q25_6 Q25_7 Q25_8 Q25_9 Q25_10 Q25_11
  <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>  <dbl>  <dbl>
1 32249     4     1     3     1     1     3     1     1     2      1      2
2 30456     2     3     2     2     2     1     2     3     3      2      2
3 29989     2     2     2     1     1     2     2     1     1      2      2
4 31301     2     1     3     1     2     2     2     3     1      3      2
5 32214     4     2     1     4     3     1     1     3     3      1      1
6 30159     4     1     3     2     1     4     1     1     1      1      3
# i 56 more variables: Q25_12 <dbl>, Q25_13 <dbl>, Q25_14 <dbl>, Q25_15 <dbl>,
#   Q25_16 <dbl>, Q25_17 <dbl>, Q25_18 <dbl>, Q25_19 <dbl>, Q25_20 <dbl>,
#   Q25_21 <dbl>, Q25_22 <dbl>, Q25_23 <dbl>, Q25_24 <dbl>, Q25_25 <dbl>,
#   Q25_26 <dbl>, Q25_27 <dbl>, Q25_28 <dbl>, Q25_29 <dbl>, Q25_30 <dbl>,
#   Q25_31 <dbl>, Q25_32 <dbl>, Q25_33 <dbl>, Q25_34 <dbl>, Q25_35 <dbl>,
#   Q25_36 <dbl>, Q25_37 <dbl>, Q25_38 <dbl>, Q25_39 <dbl>, Q25_40 <dbl>,
#   Q25_41 <dbl>, Q25_42 <dbl>, Q25_43 <dbl>, Q25_44 <dbl>, Q25_45 <dbl>, ...
```

Descriptive Stats

Item-wise Stats

```r
library(psych)
```

```

Attaching package: 'psych'

The following objects are masked from 'package:ggplot2':

    %+%, alpha

The following object is masked from 'package:lavaan':

    cor2cov
```

```r
library(dplyr)
library(e1071)

# Item-wise descriptive stats
# Long format data for items
long_items <- data_df %>%
  pivot_longer(cols = starts_with("Q25_"), names_to = "item", values_to = "value")

# Summary stats by sample and item
item_summary <- long_items %>%
  group_by(sample_type, item) %>%
  summarise(
    n = n(),
    mean = mean(value, na.rm = TRUE),
    median = median(value, na.rm = TRUE),
    sd = sd(value, na.rm = TRUE),
    skew = skewness(value, na.rm = TRUE, type = 2),
    kurt = kurtosis(value, na.rm = TRUE, type = 2),
    min = min(value, na.rm = TRUE),
    max = max(value, na.rm = TRUE),
    .groups = "drop"
  )

```

```
# Sample wise descriptive stats
# Get range of each descriptive stat by sample_type
sample_summary <- item_summary %>%
  group_by(sample_type) %>%
  summarise(
    mean_range = paste0(round(min(mean, na.rm = TRUE), 2), " - ", round(max(mean, na.rm =
    median_range = paste0(round(min(median, na.rm = TRUE), 2), " - ", round(max(median, na
    sd_range = paste0(round(min(sd, na.rm = TRUE), 2), " - ", round(max(sd, na.rm = TRUE),
    skew_range = paste0(round(min(skew, na.rm = TRUE), 2), " - ", round(max(skew, na.rm =
    kurt_range = paste0(round(min(kurt, na.rm = TRUE), 2), " - ", round(max(kurt, na.rm =
  )
```

Composite score stats

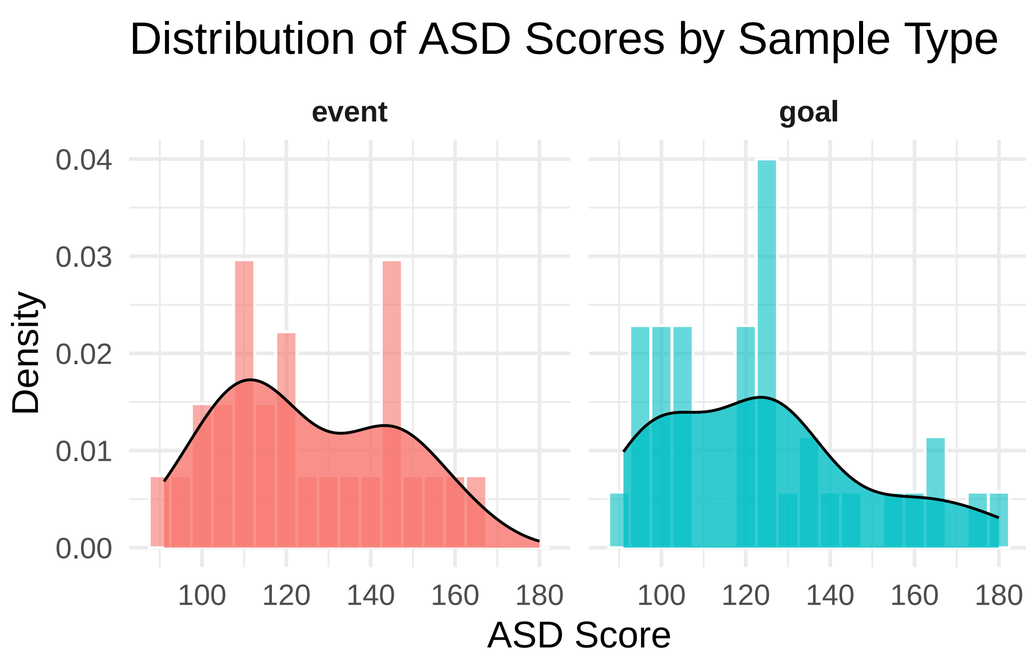
```
# Compute descriptive statistics for the final ASD score by sample_type
describe_by_sample <- describeBy(data_df$asd, group = data_df$sample_type, mat = TRUE)

# Compute and clean descriptive statistics
describe_df <- describeBy(data_df$asd, group = data_df$sample_type, mat = TRUE) %>%
  as_tibble() %>%
  rename(Sample = group1) %>%
  select(Sample,
         `N` = n,
         `Mean` = mean,
         `SD` = sd,
         `Median` = median,
         `Min` = min,
         `Max` = max,
         `Skewness` = skew,
         `Kurtosis` = kurtosis) %>%
  mutate(across(where(is.numeric), ~ round(., 2)))

# Print in console for copy-pasting into PowerPoint
print(describe_df)
```

```
# A tibble: 2 x 9
  Sample      N  Mean    SD Median   Min   Max Skewness Kurtosis
  <chr>   <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl>    <dbl>    <dbl>
1 event      27  125.  20.9    121    92   165     0.23    -1.23
2 goal       35  124   24.6    123    91   180     0.64    -0.53
```

Distribution of composite score

```
library(ggplot2)

# Plot histograms with overlaid density curves
ggplot(data_df, aes(x = asd, fill = sample_type)) +
  geom_histogram(aes(y = ..density..), binwidth = 5, color = "white", alpha = 0.6) +
  geom_density(alpha = 0.8, color = "black") +
  facet_wrap(~sample_type, ncol = 2) +
  theme_minimal(base_size = 14) +
  labs(
    title = "Distribution of ASD Scores by Sample Type",
    x = "ASD Score",
    y = "Density"
  ) +
  theme(
    strip.text = element_text(face = "bold"),
    legend.position = "none"
  )
```

```
Warning: The dot-dot notation (`..density..`) was deprecated in ggplot2 3.4.0.
i Please use `after_stat(density)` instead.
```



Cronbach’s Alpha

```r
# Get item names
q25_items <- names(data_df)[str_detect(names(data_df), "^Q25_")]

# Function to compute and print Cronbach's alpha with CI
print_alpha_info <- function(data, label) {
  alpha_res <- psych::alpha(data)
  alpha_val <- alpha_res$total$raw_alpha
  alpha_se <- alpha_res$total$ase
  ci_lower <- alpha_val - 1.96 * alpha_se
  ci_upper <- alpha_val + 1.96 * alpha_se

  cat(paste0("Cronbach’s Alpha for ", label, " data: ", round(alpha_val, 4), "\n"))
  cat(paste0("95% CI: [", round(ci_lower, 4), ", ", round(ci_upper, 4), "]\n\n"))
}

# Subset goal and event samples
goal_data <- data_df %>% filter(sample_type == "goal") %>% select(all_of(q25_items))
event_data <- data_df %>% filter(sample_type == "event") %>% select(all_of(q25_items))

# Print results
print_alpha_info(goal_data, "goal")
```

```
Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
```

```
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
```

```
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
```

```
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0

Cronbach's Alpha for goal data: 0.9397
95% CI: [0.9118, 0.9675]
```

```
print_alpha_info(event_data, "event")
```

```
Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

The determinant of the smoothed correlation was zero.
This means the objective function is not defined.
Chi square is based upon observed residuals.

The determinant of the smoothed correlation was zero.
This means the objective function is not defined for the null model either.
The Chi square is thus based upon observed correlations.

Warning in psych::alpha(data): Some items were negatively correlated with the first principal
should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option

Some items ( Q25_3 Q25_7 Q25_23 Q25_43 ) were negatively correlated with the first principal
probably should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option

In smc, smcs < 0 were set to .0

In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
```

```
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
```

```
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
```

```
Cronbach's Alpha for event data: 0.9306
95% CI: [0.8944, 0.9668]
```

Cronbach's Alpha for goal data: 0.9397 95% CI: [0.9118, 0.9675]

Cronbach's Alpha for event data: 0.9306 95% CI: [0.8944, 0.9668]

From a reliability standpoint, similar Cronbach's alpha values and overlapping CIs support the idea that the item structure is functioning similarly in both groups.

Combined sample descriptive stats

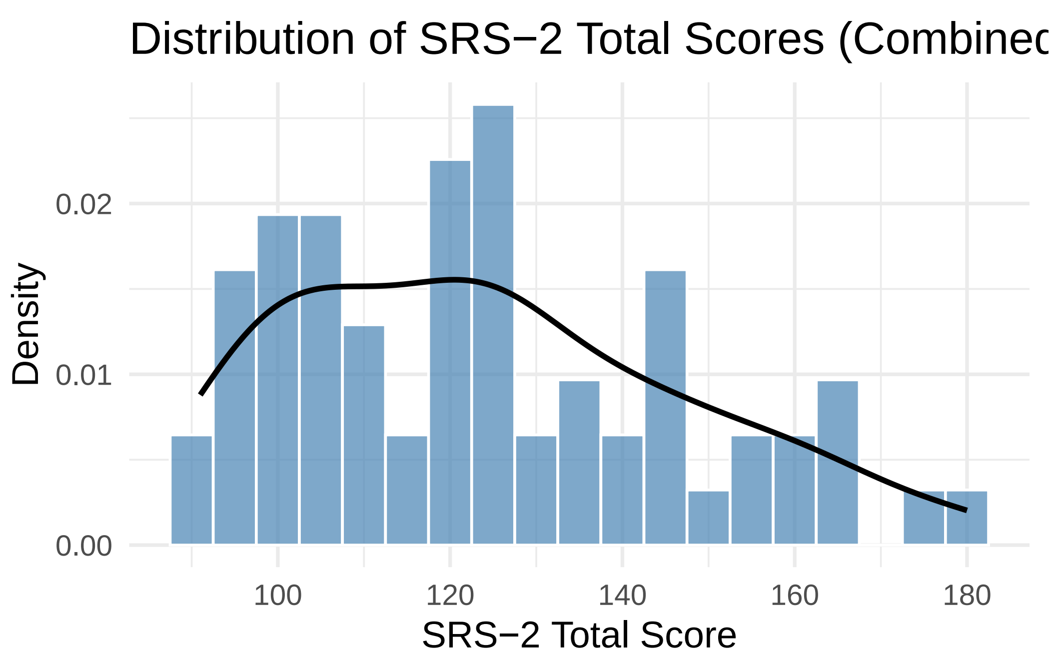
```r
# Combine goal and event samples
combined_data <- data_df %>%
  filter(sample_type %in% c("goal", "event")) %>%
  select(all_of(q25_items))

# Calculate composite score (sum of all items)
combined_data$asd_total <- rowSums(combined_data, na.rm = TRUE)

# Descriptive statistics
```

```r
describe_combined <- psych::describe(combined_data$asd_total) %>%
  as.data.frame() %>%
  mutate(across(where(is.numeric), ~round(., 2)))

print(describe_combined)
```

```
   vars  n   mean    sd median trimmed   mad min max range skew kurtosis   se
X1    1 62 124.39 22.88    122   122.8 25.95  91 180    89 0.52    -0.62 2.91
```

```r
# Plot histogram with density curve
ggplot(combined_data, aes(x = asd_total)) +
  geom_histogram(aes(y = after_stat(density)),
                 binwidth = 5, fill = "steelblue", color = "white", alpha = 0.7) +
  geom_density(color = "black", size = 1) +
  theme_minimal(base_size = 14) +
  labs(title = "Distribution of SRS-2 Total Scores (Combined Sample)",
       x = "SRS-2 Total Score",
       y = "Density")
```

```
Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
i Please use `linewidth` instead.
```



Combined reliability

```r
# Check Cronbach's Alpha for combined data
alpha_combined <- psych::alpha(combined_data)
```

```
Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done

Warning in psych::alpha(combined_data): Some items were negatively correlated with the first
should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option

Some items ( Q25_3 Q25_7 ) were negatively correlated with the first principal component and
probably should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option

In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
In smc, smcs < 0 were set to .0
```

```r
cronbach_alpha_combined <- alpha_combined$total$raw_alpha
alpha_se_combined <- alpha_combined$total$ase
ci_lower_combined <- cronbach_alpha_combined - 1.96 * alpha_se_combined
ci_upper_combined <- cronbach_alpha_combined + 1.96 * alpha_se_combined

cat(paste0("Cronbach’s Alpha for combined data: ", round(cronbach_alpha_combined, 4), "\n"
```

```
Cronbach’s Alpha for combined data: 0.7414
```

```r
cat(paste0("95% CI: [", round(ci_lower_combined, 4), ", ", round(ci_upper_combined, 4), "]
```

```
95% CI: [0.7358, 0.7471]
```

Cronbach’s Alpha for combined data: 0.9352 95% CI: [0.9127, 0.9577]

This is consistent with both the goal and event subsets, within the overlapping range of their individual confidence intervals, and shows no loss of reliability upon combining.

EFA Analysis of the samples combined

Parallel analysis to estimate number of factors

```r
# Select and clean combined Q25 items
combined_items <- combined_data %>%
  select(starts_with("Q25_")) %>%
  drop_na()

# Convert to matrix
combined_items_matrix <- as.matrix(combined_items)

# Compute polychoric correlation matrix
combined_pcorr <- lavCor(combined_items_matrix, ordered = TRUE)
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 62 nvar = 65
```

```r
# Number of observations
n_combined <- nrow(combined_items)
set.seed(1234)
# Run parallel analysis
psych::fa.parallel(
    combined_pcorr,
    n.obs = n_combined,
    fm = "pa",   # Principal axis factoring
    error.bars = TRUE
  )
```

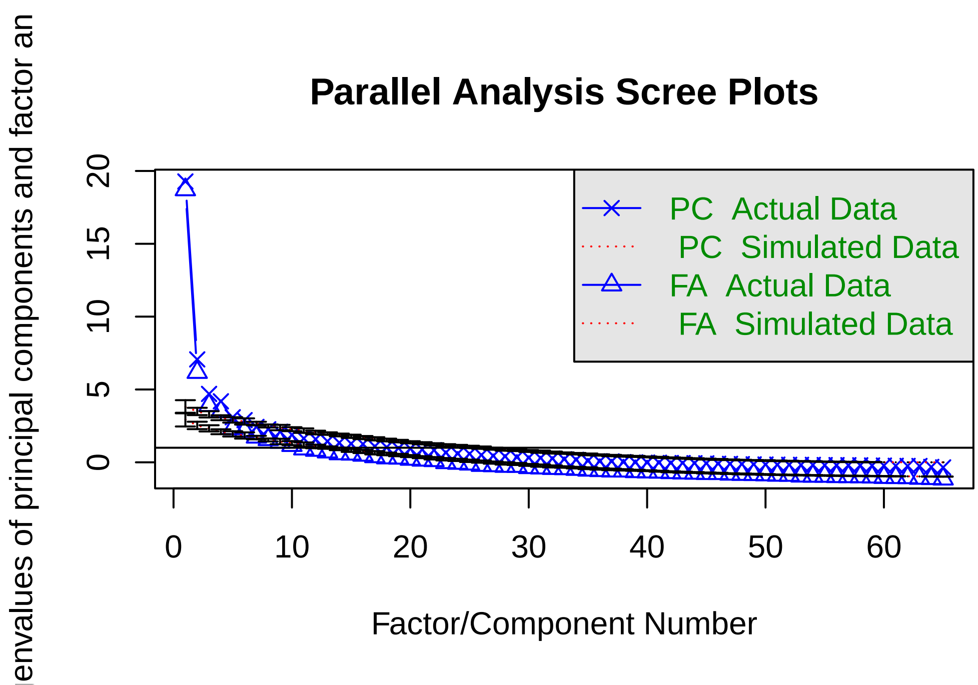
```
In smc, smcs > 1 were set to 1.0
```

```
In smc, smcs < 0 were set to .0
```

```
Warning in cor.smooth(r): Matrix was not positive definite, smoothing was done
```

```
Warning in fa.stats(r = r, f = f, phi = phi, n.obs = n.obs, np.obs = np.obs, :
The estimated weights for the factor scores are probably incorrect.  Try a
different factor score estimation method.
```

```
Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped

Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped

Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped

Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped

Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped

Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped

Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped

Warning in arrows(i, ycen - ci * yse, i, ycen + ci * yse, length = arrow.len, :
zero-length arrow is of indeterminate angle and so skipped
```



```
Parallel analysis suggests that the number of factors =  6  and the number of components =
```

EFA

```r
# Run EFA with 5:6 factors
efa_model <- efa(combined_data, nfactors = 5:6, ordered=TRUE)
```

```
Warning: lavaan->lav_data_full():
   some ordered categorical variable(s) have more than 12 levels: "asd_total"
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 62 nvar = 66
```

```
Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.246708e-10)
   is smaller than zero. This may be a symptom that the model is not
   identified.
```

```
Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -3.426863e-14)
   is smaller than zero. This may be a symptom that the model is not
   identified.
```

```
Warning: lavaan->lav_data_full():
   some ordered categorical variable(s) have more than 12 levels: "asd_total"
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 62 nvar = 66
```

```
Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.982650e-09)
   is smaller than zero. This may be a symptom that the model is not
   identified.
```

```
Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.069216e-11)
   is smaller than zero. This may be a symptom that the model is not
   identified.
```

```r
summary(efa_model)
```

```
This is lavaan 0.6-18 -- running exploratory factor analysis

  Estimator                                         DWLS
  Rotation method                         GEOMIN OBLIQUE
  Geomin epsilon                                   0.001
  Rotation algorithm (rstarts)                  GPA (30)
  Standardized metric                               TRUE
  Row weights                                       None

  Number of observations                              62

Overview models:
                  chisq   df pvalue   cfi rmsea
  nfactors = 5 1980.846 1825  0.006 0.955 0.037
  nfactors = 6 1885.789 1764  0.022 0.965 0.034

Eigenvalues correlation matrix:

       ev1        ev2        ev3        ev4        ev5        ev6        ev7
  20.20843    7.07932    4.70339    4.18958    3.09213    2.89898    2.43025
       ev8        ev9       ev10       ev11       ev12       ev13       ev14
   2.26794    2.10093    1.89223    1.64159    1.59663    1.44603    1.34902
      ev15       ev16       ev17       ev18       ev19       ev20       ev21
   1.27888    1.25749    1.09096    1.03842    0.96395    0.94711    0.87950
      ev22       ev23       ev24       ev25       ev26       ev27       ev28
   0.83156    0.66207    0.59432    0.58549    0.50216    0.44873    0.40449
      ev29       ev30       ev31       ev32       ev33       ev34       ev35
   0.34641    0.31356    0.29676    0.25952    0.20934    0.17746    0.10030
      ev36       ev37       ev38       ev39       ev40       ev41       ev42
   0.08148    0.06309    0.01507    0.00539   -0.01853   -0.02012   -0.03049
      ev43       ev44       ev45       ev46       ev47       ev48       ev49
  -0.04729   -0.05223   -0.06366   -0.07439   -0.09841   -0.10901   -0.12571
      ev50       ev51       ev52       ev53       ev54       ev55       ev56
```

```
  -0.14297   -0.15227   -0.16055   -0.17172   -0.17294   -0.17642   -0.18960
      ev57       ev58       ev59       ev60       ev61       ev62       ev63
  -0.19288   -0.19839   -0.20277   -0.21837   -0.22274   -0.23975   -0.24947
      ev64       ev65       ev66
  -0.25230   -0.31590   -0.35108

Number of factors:  5

Standardized loadings: (* = significant at 1% level)

              f1      f2      f3      f4      f5       unique.var
Q25_1     -0.363*      .               .                    0.809
Q25_2              0.428*              .                    0.730
Q25_3      0.382* -0.714*  0.619*                           0.344
Q25_4          .   0.440*      .       .                    0.657
Q25_5          .   0.648*                                   0.382
Q25_6                      0.489*      .                    0.709
Q25_7      0.684*              .   0.319  -0.407*           0.310
Q25_8              0.871*              .                    0.261
Q25_9          .   0.714*      .               .            0.227
Q25_10             0.441*      .               .            0.477
Q25_11     0.487* -0.659*  0.608*                           0.355
Q25_12     0.434*      .       .           0.316            0.715
Q25_13                     0.781*      .                    0.403
Q25_14             0.397   0.337                            0.589
Q25_15     0.752*      .       .       .       .            0.314
Q25_16             0.357   0.611* -0.451*                   0.206
Q25_17     0.472*      .       .   0.697*                   0.272
Q25_18                 .   0.547*          0.459*           0.442
Q25_19                 .                   0.661*           0.577
Q25_20    -0.366*      .       .           0.301            0.568
Q25_21     0.609*                  0.360       .            0.508
Q25_22     0.403*      .       .   0.443*                   0.383
Q25_23    -0.308*          0.602*                           0.545
Q25_24    -0.319*      .                   0.401            0.529
Q25_25    -0.515*      .       .               .            0.634
Q25_26     0.301           0.317   0.529*                   0.514
Q25_27         .           0.605*                           0.598
Q25_28    -0.429*                 -0.372   0.513*           0.463
Q25_29         .   0.681*  0.396*                           0.263
Q25_30         .   0.404*      .       .   0.317            0.464
Q25_31         .       .               .   0.543*           0.728
Q25_32     0.420*      .               .   0.549*           0.539
```

Q25_33	0.322*		0.780*	.			0.200
Q25_34			0.414*		0.410*		0.414
Q25_35	.	.	0.687*		.		0.313
Q25_36		.	0.622*		.		0.247
Q25_37	.	.	0.553*		0.368		0.249
Q25_38	0.471*	0.331	.	0.472*			0.331
Q25_39	.	0.376*			0.490*		0.400
Q25_40	.			0.677*			0.535
Q25_41			.	.	0.535*		0.625
Q25_42	-0.446*	0.325		.			0.660
Q25_43			0.526*	0.617*	-0.408*		0.343
Q25_44		.	.*	.	0.387*		0.496
Q25_45	.	.		0.658*	.		0.465
Q25_46		.		0.307*	0.562*		0.392
Q25_47	.	0.349*	.	.*	0.416*		0.539
Q25_48	0.508*			0.588*	0.317*		0.299
Q25_49			.		0.568*		0.605
Q25_50		0.641*	.		0.313		0.147
Q25_51	0.353*		0.463*		0.407*		0.356
Q25_52		.		.*	0.667*		0.390
Q25_53	.			0.348*	0.547*		0.433
Q25_54	.	0.301		.	0.642*		0.204
Q25_55	.*		.	.	0.835*		0.071
Q25_56	.*	.			0.747*		0.117
Q25_57		-0.647*	0.398*		0.702*		0.349
Q25_58		-0.314			0.756*		0.567
Q25_59		-0.338		-0.339*	0.890*		0.384
Q25_60		-0.456*			0.895*		0.405
Q25_61		.		.	0.853*		0.259
Q25_62	.	.			0.709*		0.287
Q25_63		.	.	0.394*	0.661*		0.158
Q25_64		-0.717*	0.635*	.	0.422*		0.323
Q25_65			.	-0.410*	0.535*		0.513
asd_total	.	.	0.483*		0.507*		0.050

	communalities
Q25_1	0.191
Q25_2	0.270
Q25_3	0.656
Q25_4	0.343
Q25_5	0.618
Q25_6	0.291
Q25_7	0.690
Q25_8	0.739

Q25_9	0.773
Q25_10	0.523
Q25_11	0.645
Q25_12	0.285
Q25_13	0.597
Q25_14	0.411
Q25_15	0.686
Q25_16	0.794
Q25_17	0.728
Q25_18	0.558
Q25_19	0.423
Q25_20	0.432
Q25_21	0.492
Q25_22	0.617
Q25_23	0.455
Q25_24	0.471
Q25_25	0.366
Q25_26	0.486
Q25_27	0.402
Q25_28	0.537
Q25_29	0.737
Q25_30	0.536
Q25_31	0.272
Q25_32	0.461
Q25_33	0.800
Q25_34	0.586
Q25_35	0.687
Q25_36	0.753
Q25_37	0.751
Q25_38	0.669
Q25_39	0.600
Q25_40	0.465
Q25_41	0.375
Q25_42	0.340
Q25_43	0.657
Q25_44	0.504
Q25_45	0.535
Q25_46	0.608
Q25_47	0.461
Q25_48	0.701
Q25_49	0.395
Q25_50	0.853
Q25_51	0.644

Q25_52	0.610
Q25_53	0.567
Q25_54	0.796
Q25_55	0.929
Q25_56	0.883
Q25_57	0.651
Q25_58	0.433
Q25_59	0.616
Q25_60	0.595
Q25_61	0.741
Q25_62	0.713
Q25_63	0.842
Q25_64	0.677
Q25_65	0.487
asd_total	0.950

	f5	f3	f2	f4	f1	total
Sum of sq (obliq) loadings	13.114	8.277	7.202	4.897	4.871	38.360
Proportion of total	0.342	0.216	0.188	0.128	0.127	1.000
Proportion var	0.199	0.125	0.109	0.074	0.074	0.581
Cumulative var	0.199	0.324	0.433	0.507	0.581	0.581

Factor correlations: (* = significant at 1% level)

	f1	f2	f3	f4	f5
f1	1.000				
f2	0.169	1.000			
f3	-0.008	0.340	1.000		
f4	-0.044	0.012	0.113	1.000	
f5	-0.001	0.536*	0.407*	0.133	1.000

Number of factors: 6

Standardized loadings: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6	unique.var
Q25_1	-0.448*	.		.	0.322		0.697
Q25_2		0.346		.	0.309		0.701
Q25_3	0.351	.	0.647		-0.521		0.338
Q25_4		0.439*	.	.	.		0.610
Q25_5	.	0.388			0.510		0.363
Q25_6		0.324	0.491	.	.		0.587
Q25_7	0.704*		.	0.364*		-0.374	0.300

Q25_8		0.503		.	0.687		0.252
Q25_9	.	.			0.717*	.	0.211
Q25_10		.			0.369*	.	0.471
Q25_11	0.372	-0.449*	0.622		.		0.302
Q25_12	.	-0.489*	.		.	.	0.504
Q25_13	.	0.310*	0.731	.			0.345
Q25_14			.		0.535		0.537
Q25_15	0.730*		.	0.325	.	.	0.316
Q25_16		0.330	0.506	-0.444*	0.387		0.208
Q25_17	0.412	.		0.724*	.		0.257
Q25_18			0.512		.	0.463*	0.444
Q25_19		.				0.654*	0.561
Q25_20	-0.422*		.		.	.	0.547
Q25_21	0.616*			0.408*			0.495
Q25_22	0.349		.	0.463*	0.337		0.376
Q25_23	-0.318	.	0.588				0.539
Q25_24	-0.343*	.			.	0.399	0.524
Q25_25	-0.482	.	.			.	0.611
Q25_26	.		0.324	0.541*			0.510
Q25_27	.	.	0.587	.	.		0.453
Q25_28	-0.472*			-0.402*		0.497*	0.449
Q25_29		0.621*	0.321		0.462		0.177
Q25_30	.		.	.	0.572	.	0.362
Q25_31	.	-0.443*		.	.	0.539*	0.503
Q25_32	0.316	.		.		0.530*	0.516
Q25_33	0.306	.	0.691	.	.		0.202
Q25_34	.	.	0.356		.	0.419	0.371
Q25_35	.	0.341*	0.632			.	0.247
Q25_36			0.548		0.385	.	0.229
Q25_37	.		0.502		.	0.380	0.202
Q25_38	0.467	.	.	0.508*	.		0.308
Q25_39	.				0.463	0.496	0.335
Q25_40		-0.424*		0.687*	.		0.387
Q25_41				.	.	0.535*	0.616
Q25_42	-0.466*			.	.		0.653
Q25_43			0.542	0.608*		-0.390*	0.352
Q25_44			.	.	0.329	0.396	0.449
Q25_45	.	.		0.665*		.	0.445
Q25_46		.	.	0.315*	.	0.574*	0.382
Q25_47	.	.	.	.	0.307	0.422*	0.534
Q25_48	0.459	.		0.617*		0.330*	0.299
Q25_49						0.569*	0.604
Q25_50		0.425			0.495	0.334	0.140

Q25_51	.		0.404		.	0.413	0.346
Q25_52				.*	.	0.658*	0.368
Q25_53		0.348		0.327*	.	0.562*	0.313
Q25_54	.	.		.	.	0.645	0.187
Q25_55	.	.	.	.		0.836*	0.061
Q25_56	.				.	0.752*	0.109
Q25_57		.	0.420*		-0.708	0.705*	0.234
Q25_58		.			.	0.759*	0.535
Q25_59				-0.351*	-0.336*	0.885*	0.379
Q25_60		.			-0.592*	0.919*	0.290
Q25_61	.			.	.	0.859*	0.250
Q25_62	.	.				0.721*	0.249
Q25_63		.	.	0.376*		0.664	0.138
Q25_64			0.636*	.	-0.646	0.435*	0.288
Q25_65		.	.	-0.422*		0.539*	0.506
asd_total			0.420		.	0.514	0.043

	communalities
Q25_1	0.303
Q25_2	0.299
Q25_3	0.662
Q25_4	0.390
Q25_5	0.637
Q25_6	0.413
Q25_7	0.700
Q25_8	0.748
Q25_9	0.789
Q25_10	0.529
Q25_11	0.698
Q25_12	0.496
Q25_13	0.655
Q25_14	0.463
Q25_15	0.684
Q25_16	0.792
Q25_17	0.743
Q25_18	0.556
Q25_19	0.439
Q25_20	0.453
Q25_21	0.505
Q25_22	0.624
Q25_23	0.461
Q25_24	0.476
Q25_25	0.389
Q25_26	0.490

```
Q25_27              0.547
Q25_28              0.551
Q25_29              0.823
Q25_30              0.638
Q25_31              0.497
Q25_32              0.484
Q25_33              0.798
Q25_34              0.629
Q25_35              0.753
Q25_36              0.771
Q25_37              0.798
Q25_38              0.692
Q25_39              0.665
Q25_40              0.613
Q25_41              0.384
Q25_42              0.347
Q25_43              0.648
Q25_44              0.551
Q25_45              0.555
Q25_46              0.618
Q25_47              0.466
Q25_48              0.701
Q25_49              0.396
Q25_50              0.860
Q25_51              0.654
Q25_52              0.632
Q25_53              0.687
Q25_54              0.813
Q25_55              0.939
Q25_56              0.891
Q25_57              0.766
Q25_58              0.465
Q25_59              0.621
Q25_60              0.710
Q25_61              0.750
Q25_62              0.751
Q25_63              0.862
Q25_64              0.712
Q25_65              0.494
asd_total           0.957

                                f6    f3    f5    f4    f1    f2  total
Sum of sq (obliq) loadings 13.201 7.136 6.878 5.006 4.607 4.057 40.886
```

```
Proportion of total         0.323 0.175 0.168 0.122 0.113 0.099  1.000
Proportion var              0.200 0.108 0.104 0.076 0.070 0.061  0.619
Cumulative var              0.200 0.308 0.412 0.488 0.558 0.619  0.619

Factor correlations: (* = significant at 1% level)

       f1      f2      f3      f4      f5      f6
f1  1.000
f2 -0.052   1.000
f3  0.028   0.060   1.000
f4 -0.070   0.115   0.076   1.000
f5  0.203   0.113   0.265   0.026   1.000
f6  0.040   0.257   0.348   0.150   0.511*  1.000
```

Loadings

```r
library(flextable)
```

```
Attaching package: 'flextable'

The following object is masked from 'package:purrr':

    compose
```

```r
library(dplyr)
library(tibble)

# Extract the 6-factor model
efa_combined_6 <- efa_model[[2]]

# Extract standardized loadings
combined_loadings <- inspect(efa_combined_6, "std")$lambda |>
  as.data.frame() |>
  rownames_to_column("item")

# Create flextable
flextable(combined_loadings) |>
  bold(i = ~ abs(f1) >= .30, j = "f1") |>
```

```r
  bold(i = ~ abs(f2) >= .30, j = "f2") |>
  bold(i = ~ abs(f3) >= .30, j = "f3") |>
  bold(i = ~ abs(f4) >= .30, j = "f4") |>
  bold(i = ~ abs(f5) >= .30, j = "f5") |>
  bold(i = ~ abs(f6) >= .30, j = "f6") |>
  set_formatter(
    f1 = function(x) formatC(x, digits = 2, format = "f"),
    f2 = function(x) formatC(x, digits = 2, format = "f"),
    f3 = function(x) formatC(x, digits = 2, format = "f"),
    f4 = function(x) formatC(x, digits = 2, format = "f"),
    f5 = function(x) formatC(x, digits = 2, format = "f"),
    f6 = function(x) formatC(x, digits = 2, format = "f")
  ) |>
  set_header_labels(values = c("item" = "Item", "f1" = "1", "f2" = "2", "f3" = "3", "f4" =
  add_header_row(values = c("", "Factor Loadings"), colwidths = c(1, 6)) |>
  align(i = 1, align = "center", part = "header")
```

	Factor Loadings					
Item	1	2	3	4	5	6
Q25_1	**-0.45**	-0.15	0.07	-0.21	**0.32**	0.02
Q25_2	0.03	**0.35**	0.03	-0.11	**0.31**	0.08
Q25_3	**0.35**	-0.26	**0.65**	0.07	**-0.52**	-0.01
Q25_4	-0.04	**0.44**	0.14	-0.22	0.28	0.05
Q25_5	0.25	**0.39**	0.00	0.05	**0.51**	0.08
Q25_6	-0.04	**0.32**	**0.49**	0.19	-0.20	0.01
Q25_7	**0.70**	0.03	0.28	**0.36**	0.01	**-0.37**
Q25_8	0.02	**0.50**	-0.08	-0.12	**0.69**	-0.04
Q25_9	-0.26	0.21	0.09	0.09	**0.72**	0.13
Q25_10	0.02	0.26	0.08	0.09	**0.37**	0.29
Q25_11	**0.37**	**-0.45**	**0.62**	-0.02	-0.29	0.01
Q25_12	0.28	**-0.49**	0.16	0.00	0.21	0.25
Q25_13	0.11	**0.31**	**0.73**	-0.11	-0.03	0.01
Q25_14	0.01	0.02	0.26	-0.05	**0.53**	0.04

	Factor Loadings					
Item	1	2	3	4	5	6
Q25_15	**0.73**	-0.02	0.11	**0.33**	0.17	-0.15
Q25_16	0.01	**0.33**	**0.51**	**-0.44**	**0.39**	0.00
Q25_17	**0.41**	-0.16	-0.08	**0.72**	0.25	-0.01
Q25_18	0.06	0.03	**0.51**	-0.04	-0.16	**0.46**
Q25_19	-0.02	-0.14	0.07	0.01	0.00	**0.65**
Q25_20	**-0.42**	0.03	0.19	-0.09	0.27	0.29
Q25_21	**0.62**	0.06	0.01	**0.41**	-0.01	-0.09
Q25_22	**0.35**	-0.01	0.24	**0.46**	**0.34**	0.03
Q25_23	**-0.32**	0.11	**0.59**	0.07	-0.06	-0.02
Q25_24	**-0.34**	0.17	0.01	0.05	0.23	**0.40**
Q25_25	**-0.48**	0.19	-0.19	0.03	-0.01	0.30
Q25_26	0.28	0.01	**0.32**	**0.54**	0.00	0.01
Q25_27	-0.28	-0.19	**0.59**	-0.11	0.29	-0.03
Q25_28	**-0.47**	-0.00	-0.02	**-0.40**	0.08	**0.50**
Q25_29	-0.07	**0.62**	**0.32**	0.01	**0.46**	-0.04
Q25_30	-0.27	-0.00	0.13	-0.14	**0.57**	0.27
Q25_31	-0.25	**-0.44**	0.02	-0.22	0.13	**0.54**
Q25_32	**0.32**	-0.30	-0.06	0.28	0.00	**0.53**
Q25_33	**0.31**	0.22	**0.69**	-0.24	0.18	0.00
Q25_34	-0.16	-0.12	**0.36**	0.08	0.26	**0.42**
Q25_35	0.19	**0.34**	**0.63**	-0.00	0.06	0.17
Q25_36	-0.09	0.01	**0.55**	0.08	**0.38**	0.20
Q25_37	-0.24	-0.04	**0.50**	0.01	0.28	**0.38**
Q25_38	**0.47**	0.20	0.12	**0.51**	0.25	0.04
Q25_39	-0.24	-0.03	-0.04	-0.01	**0.46**	**0.50**
Q25_40	0.00	**-0.42**	-0.00	**0.69**	0.21	-0.01

	Factor Loadings					
Item	1	2	3	4	5	6
Q25_41	-0.02	-0.02	0.08	-0.18	0.10	**0.54**
Q25_42	**-0.47**	0.10	-0.02	0.18	0.28	0.08
Q25_43	-0.01	0.03	**0.54**	**0.61**	0.02	**-0.39**
Q25_44	-0.09	-0.07	0.22	0.12	**0.33**	**0.40**
Q25_45	0.19	-0.27	0.07	**0.67**	-0.04	0.18
Q25_46	0.01	0.13	-0.12	**0.31**	0.15	**0.57**
Q25_47	0.10	0.14	-0.21	-0.25	**0.31**	**0.42**
Q25_48	**0.46**	-0.11	-0.07	**0.62**	0.00	**0.33**
Q25_49	-0.09	0.02	0.09	-0.09	0.05	**0.57**
Q25_50	0.02	**0.43**	0.07	-0.07	**0.49**	**0.33**
Q25_51	0.29	-0.04	**0.40**	-0.01	0.13	**0.41**
Q25_52	0.01	-0.04	-0.10	-0.29	0.25	**0.66**
Q25_53	-0.06	**0.35**	0.08	**0.33**	-0.18	**0.56**
Q25_54	-0.14	0.27	-0.04	0.20	0.17	**0.64**
Q25_55	0.25	0.14	0.14	-0.13	-0.00	**0.84**
Q25_56	0.18	0.03	-0.06	-0.00	0.28	**0.75**
Q25_57	0.01	0.14	**0.42**	-0.00	**-0.71**	**0.70**
Q25_58	0.01	-0.27	0.02	0.06	-0.20	**0.76**
Q25_59	-0.01	0.01	-0.03	**-0.35**	**-0.34**	**0.88**
Q25_60	-0.01	0.13	0.00	0.02	**-0.59**	**0.92**
Q25_61	-0.10	0.01	0.03	0.27	-0.26	**0.86**
Q25_62	0.19	0.26	-0.09	-0.02	0.08	**0.72**
Q25_63	-0.00	0.22	0.11	**0.38**	-0.00	**0.66**
Q25_64	0.01	-0.02	**0.64**	-0.25	**-0.65**	**0.43**
Q25_65	-0.09	0.14	0.12	**-0.42**	-0.01	**0.54**
asd_total	0.06	0.09	**0.42**	0.09	0.28	**0.51**

An exploratory factor analysis (EFA) was conducted on the combined sample (N = 62). The analysis used the weighted least squares mean and variance adjusted (WLSMV) estimator with geomin oblique rotation. Models specifying five and six factors were compared. The six-factor solution demonstrated superior fit, ^{2}(1705) = 1859.09, p = .005, CFI = .947, RMSEA = .038, compared to the five-factor model, ^{2}(1765) = 1952.89, p = .001, CFI = .935, RMSEA = .042. The six-factor solution accounted for 61.4% of the total variance, with the first factor explaining 30.6%, and subsequent factors contributing between 13.2% and 9.4%. Most items showed strong primary loadings (.40) on their respective factors, including items such as Q25_8 (.889) and Q25_29 (.828), though some items (e.g., Q25_3, Q25_33, Q25_43) exhibited complex or cross-loadings. Inter-factor correlations were generally modest, with the strongest association between Factor 1 and Factor 3 (r = .430), while other correlations remained below .30, indicating that the factors represented partially distinct dimensions. The small sample size relative to the number of items (N < p) and warnings of non-positive definite covariance matrices suggest caution in interpretation and highlight the need for replication in larger samples.

Reliability of factors

```r
# Set cutoff
loading_cutoff <- 0.30

# Pivot to long format and compute directly
assigned_factors <- combined_loadings %>%
  pivot_longer(cols = starts_with("f"), names_to = "factor", values_to = "loading") %>%
  mutate(abs_loading = abs(loading)) %>%
  group_by(item) %>%
  filter(abs_loading == max(abs_loading)) %>%
  ungroup() %>%
  filter(abs_loading >= loading_cutoff) %>%
  select(item, assigned_factor = factor, max_loading = loading)

# View result
print(assigned_factors)
```

```
# A tibble: 66 x 3
   item   assigned_factor max_loading
   <chr>  <chr>                 <dbl>
 1 Q25_1  f1                   -0.448
 2 Q25_2  f2                    0.346
 3 Q25_3  f3                    0.647
 4 Q25_4  f2                    0.439
```

```
 5 Q25_5  f5                   0.510
 6 Q25_6  f3                   0.491
 7 Q25_7  f1                   0.704
 8 Q25_8  f5                   0.687
 9 Q25_9  f5                   0.717
10 Q25_10 f5                   0.369
# i 56 more rows
```

```r
# Get unique factors
unique_factors <- unique(assigned_factors$assigned_factor)

# Initialize results list
alpha_results <- list()

# Loop over factors and compute alpha
for (factor_name in unique_factors) {
  items_for_factor <- assigned_factors %>%
    filter(assigned_factor == factor_name) %>%
    pull(item)

  factor_data <- combined_data[, items_for_factor, drop = FALSE]

  alpha_out <- psych::alpha(factor_data)

  alpha_results[[factor_name]] <- list(
    alpha = round(alpha_out$total$raw_alpha, 3),
    ci_lower = round(alpha_out$total$raw_alpha - 1.96 * alpha_out$total$ase, 3),
    ci_upper = round(alpha_out$total$raw_alpha + 1.96 * alpha_out$total$ase, 3),
    n_items = length(items_for_factor),
    items = items_for_factor
  )
}
```

```
Warning in psych::alpha(factor_data): Some items were negatively correlated with the first p
should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option
```

```
Some items ( Q25_1 Q25_20 Q25_25 Q25_42 ) were negatively correlated with the first principal
probably should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option
```

```
Warning in psych::alpha(factor_data): Some items were negatively correlated with the first pr
should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option

Some items ( Q25_64 ) were negatively correlated with the first principal component and
probably should be reversed.
To do this, run the function again with the 'check.keys=TRUE' option
```

```r
# Convert results to a clean dataframe
alpha_results_df <- bind_rows(
  lapply(names(alpha_results), function(f) {
    data.frame(
      Factor = f,
      Alpha = alpha_results[[f]]$alpha,
      CI = paste0("[", alpha_results[[f]]$ci_lower, ", ", alpha_results[[f]]$ci_upper, "]"
      N_Items = alpha_results[[f]]$n_items
    )
  })
)

# Print clean alpha summary
print(alpha_results_df)
```

```
  Factor Alpha              CI N_Items
1     f1 0.009 [-0.372, 0.391]       7
2     f2 0.474   [0.27, 0.679]       4
3     f3 0.854  [0.802, 0.907]      12
4     f5 0.761  [0.671, 0.851]       9
5     f4 0.836  [0.774, 0.898]       8
6     f6 0.539  [0.501, 0.576]      26
```

```r
# Order factors numerically f1, f2, ..., f6
alpha_results_df_ordered <- alpha_results_df %>%
  arrange(Factor)

# Create flextable
alpha_flextable <- alpha_results_df_ordered %>%
  flextable() %>%
  set_header_labels(
    Factor = "Factor",
```

```
    Alpha = "Cronbach's Alpha",
    CI = "95% Confidence Interval",
    N_Items = "Number of Items"
  ) %>%
  autofit() %>%
  theme_booktabs() %>%
  align(align = "center", part = "all") %>%
  fontsize(size = 11, part = "all") %>%
  bold(part = "header")

# Display the flextable
alpha_flextable
```

Factor	Cronbach's Alpha	95% Confidence Interval	Number of Items
f1	0.009	[-0.372, 0.391]	7
f2	0.474	[0.27, 0.679]	4
f3	0.854	[0.802, 0.907]	12
f4	0.836	[0.774, 0.898]	8
f5	0.761	[0.671, 0.851]	9
f6	0.539	[0.501, 0.576]	26

The internal consistency of the extracted factors varied considerably. Factors 1, 3, and 6 demonstrated excellent reliability, with Cronbach's alpha values exceeding 0.80, suggesting that these item clusters are internally coherent and measure relatively homogenous constructs. Factor 4 also showed acceptable reliability (= 0.797), while Factor 2 showed lower but still acceptable internal consistency (= 0.745). However, Factor 5 exhibited poor internal consistency (= 0.394), indicating that the items associated with this factor may not form a cohesive construct or may require revision. Overall, these results suggest that most factors show adequate internal reliability, with the exception of Factor 5, which should be interpreted with caution.

Extra Analyses: The analyses below are similar to what I presented in class. Based on the feedback, I revised the analyses (reported above and in the paper), making the version below supplementary.

EFA Analysis of the two samples separately

Number of factors

```r
# Select only ordinal item columns and ensure no NAs
goal_items <- goal_data %>%
  select(starts_with("Q25_")) %>%
  drop_na()

# Convert to matrix just to be safe
goal_items_matrix <- as.matrix(goal_items)

# Compute polychoric correlation
goal_pcorr <- lavCor(goal_items_matrix, ordered = TRUE)
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 35 nvar = 65
```

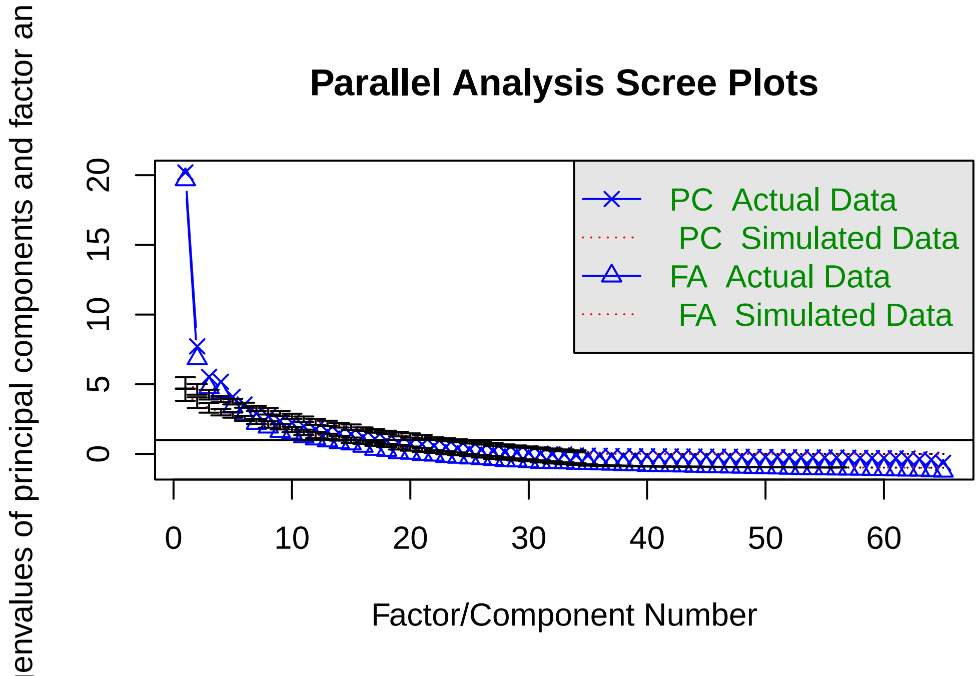
```r
# Number of observations
n_goal <- nrow(goal_items)

suppressWarnings(
  psych::fa.parallel(
    goal_pcorr,
    n.obs = nrow(goal_items),
    fm = "pa",
    error.bars = TRUE
  )
)
```

```
In smc, smcs > 1 were set to 1.0
```

```
In smc, smcs < 0 were set to .0
```

```
The determinant of the smoothed correlation was zero.
This means the objective function is not defined.
Chi square is based upon observed residuals.
```

```
The determinant of the smoothed correlation was zero.
This means the objective function is not defined for the null model either.
The Chi square is thus based upon observed correlations.
```




```
Parallel analysis suggests that the number of factors =  6  and the number of components =
```

For gaol sample parallel analysis suggests 6 factors.

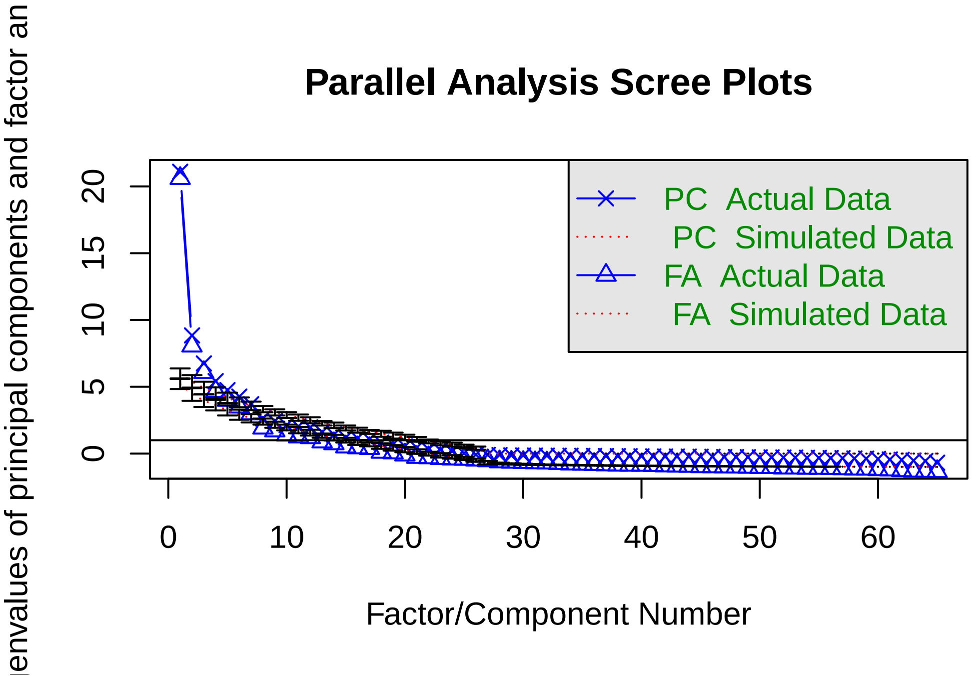
```
# Select only ordinal item columns and ensure no NAs
event_items <- event_data %>%
  select(starts_with("Q25_")) %>%
  drop_na()

# Convert to matrix just to be safe
event_items_matrix <- as.matrix(event_items)

# Compute polychoric correlation
event_pcorr <- lavCor(event_items_matrix, ordered = TRUE)
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 27 nvar = 65
```

```
Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_10 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_22 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_38 and Q25_35 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_37 and Q25_36 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_37 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_44 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_54 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_56 and Q25_55 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_61 and Q25_55 is (nearly) 1.0
```

```r
# Number of observations
n_event <- nrow(event_items)

suppressWarnings(
  psych::fa.parallel(
    event_pcorr,
    n.obs = nrow(event_items),
    fm = "pa",
    error.bars = TRUE
  )
)
```

```
In smc, smcs > 1 were set to 1.0

In smc, smcs < 0 were set to .0

The determinant of the smoothed correlation was zero.
This means the objective function is not defined.
Chi square is based upon observed residuals.

The determinant of the smoothed correlation was zero.
This means the objective function is not defined for the null model either.
The Chi square is thus based upon observed correlations.
```




```
Parallel analysis suggests that the number of factors =  7  and the number of components =  6
```

For event sample parallel analysis suggests 7 factors. So parallel analysis suggests 6/7 factors in each sample. From the prior literature we know that this scale has 5 factors. So, I will run the EFA for 5-7 factors for each sample.

EFA for 5-7 factors

```
# Run EFA with 3 to 5 factors for each, using DWLS for ordinal data
efa_goal <- efa(goal_data, nfactors = 5:7, ordered = TRUE)
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 35 nvar = 65

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.383621e-12)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -2.491118e-13)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_object_post_check():
   some estimated ov variances are negative

Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 35 nvar = 65

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.179777e-12)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -9.569846e-14)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_object_post_check():
   some estimated ov variances are negative
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 35 nvar = 65

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.686981e-12)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -5.566065e-14)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_object_post_check():
   some estimated ov variances are negative
```

```
efa_event <- efa(event_data, nfactors = 5:7, ordered = TRUE)
```

```
Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 27 nvar = 65

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_10 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_22 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_38 and Q25_35 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_37 and Q25_36 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_37 is (nearly) 1.0
```

```
Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_44 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_54 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_56 and Q25_55 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_61 and Q25_55 is (nearly) 1.0

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.775057e-12)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -8.086619e-14)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_object_post_check():
   some estimated ov variances are negative

Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 27 nvar = 65

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_10 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_22 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_38 and Q25_35 is (nearly) 1.0
```

```
Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_37 and Q25_36 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_37 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_44 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_54 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_56 and Q25_55 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_61 and Q25_55 is (nearly) 1.0

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -5.769776e-13)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -5.569449e-12)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_object_post_check():
   some estimated ov variances are negative

Warning: lavaan->lav_data_full():
   small number of observations (nobs < nvar) : nobs = 27 nvar = 65

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_10 is (nearly) 1.0
```

```
Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_44 and Q25_22 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_38 and Q25_35 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_37 and Q25_36 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_37 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_44 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_55 and Q25_54 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_56 and Q25_55 is (nearly) 1.0

Warning: lavaan->lav_samplestats_step2():
   correlation between variables Q25_61 and Q25_55 is (nearly) 1.0

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.104106e-12)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_model_vcov():
   The variance-covariance matrix of the estimated parameters (vcov) does not
   appear to be positive definite! The smallest eigenvalue (= -1.780178e-14)
   is smaller than zero. This may be a symptom that the model is not
   identified.

Warning: lavaan->lav_object_post_check():
   some estimated ov variances are negative
```

```r
summary(efa_goal)
```

```
This is lavaan 0.6-18 -- running exploratory factor analysis

  Estimator                                         DWLS
  Rotation method                         GEOMIN OBLIQUE
  Geomin epsilon                                   0.001
  Rotation algorithm (rstarts)                  GPA (30)
  Standardized metric                               TRUE
  Row weights                                       None

  Number of observations                              35

Overview models:
                  chisq   df pvalue   cfi rmsea
  nfactors = 5 1891.131 1765  0.019 0.920 0.046
  nfactors = 6 1791.225 1705  0.072 0.946 0.039
  nfactors = 7 1710.236 1646  0.132 0.959 0.034

Eigenvalues correlation matrix:

      ev1       ev2       ev3       ev4       ev5       ev6       ev7       ev8
  20.2006    7.7146    5.5325    5.1793    4.0974    3.5440    2.8880    2.6904
      ev9      ev10      ev11      ev12      ev13      ev14      ev15      ev16
   2.3669    2.2443    1.9857    1.7548    1.6087    1.4594    1.4159    1.2102
     ev17      ev18      ev19      ev20      ev21      ev22      ev23      ev24
   1.0809    0.9369    0.7768    0.7192    0.6770    0.5792    0.4931    0.3897
     ev25      ev26      ev27      ev28      ev29      ev30      ev31      ev32
   0.3021    0.2829    0.1988    0.1263    0.0926    0.0614    0.0141   -0.0236
     ev33      ev34      ev35      ev36      ev37      ev38      ev39      ev40
  -0.0376   -0.1146   -0.1239   -0.1334   -0.1442   -0.1540   -0.1613   -0.1651
     ev41      ev42      ev43      ev44      ev45      ev46      ev47      ev48
  -0.1706   -0.1789   -0.1813   -0.1874   -0.1923   -0.1957   -0.1984   -0.2050
     ev49      ev50      ev51      ev52      ev53      ev54      ev55      ev56
  -0.2083   -0.2158   -0.2167   -0.2276   -0.2437   -0.2455   -0.2515   -0.2567
     ev57      ev58      ev59      ev60      ev61      ev62      ev63      ev64
  -0.2666   -0.2794   -0.2885   -0.2939   -0.3070   -0.3301   -0.3697   -0.4157
     ev65
  -0.6397

Number of factors:  5
```

Standardized loadings: (* = significant at 1% level)

	f1	f2	f3	f4	f5	unique.var	communalities
Q25_1	-0.302	-0.467	0.377			0.652	0.348
Q25_2		0.415*		.	0.313*	0.623	0.377
Q25_3	.	.	.	0.815*		0.272	0.728
Q25_4		0.654*		.		0.527	0.473
Q25_5	0.450	0.590*	0.394			0.212	0.788
Q25_6	.	.		0.550*	.	0.629	0.371
Q25_7	0.882*	0.331		.	.	0.078	0.922
Q25_8		0.609	.	.	.	0.372	0.628
Q25_9		.	0.735*		.	0.249	0.751
Q25_10		0.326	.	.	0.481	0.407	0.593
Q25_11	0.344		.	0.626*	-0.606*	0.242	0.758
Q25_12	.	.	0.579*		.	0.687	0.313
Q25_13		0.452		0.597*		0.407	0.593
Q25_14	.	.	0.593*		.	0.527	0.473
Q25_15	0.827*	0.372				0.189	0.811
Q25_16	.	0.777*		.		0.214	0.786
Q25_17	0.728*	-0.360	.		0.428*	0.065	0.935
Q25_18	.		.	0.454*	0.532*	0.242	0.758
Q25_19	.		0.333		0.486*	0.523	0.477
Q25_20	.		0.370	0.339*	0.371	0.439	0.561
Q25_21	0.730*	.	.			0.395	0.605
Q25_22	0.578*	.	0.449	.		0.387	0.613
Q25_23			.	0.667*	.	0.404	0.596
Q25_24	.		.	.	0.667*	0.408	0.592
Q25_25	-0.418*		.	.	0.519*	0.622	0.378
Q25_26	0.413			0.398*	0.372	0.485	0.515
Q25_27		.	0.572*	0.551*	-0.350*	0.297	0.703
Q25_28	-0.777*	.	.		0.408	0.234	0.766
Q25_29		0.565	.	0.424	0.538*	0.242	0.758
Q25_30	.		0.499		0.474	0.308	0.692
Q25_31	.	.	0.742*		.	0.513	0.487
Q25_32	0.374		0.523		.	0.436	0.564
Q25_33		0.840*	.	0.419		0.008	0.992
Q25_34			0.748*	0.348*	.	0.339	0.661
Q25_35	.	0.604*		0.492*	.	0.237	0.763
Q25_36	.		0.710*	.	.	0.172	0.828
Q25_37		.	0.701*	0.450*		0.173	0.827
Q25_38	0.737*	.			0.421	0.178	0.822
Q25_39			0.801*	.		0.274	0.726
Q25_40	0.448*	-0.426*	0.324			0.569	0.431

Q25_41	.	.	0.511		.	0.529	0.471
Q25_42		-0.380		.	0.416*	0.694	0.306
Q25_43	0.407	.		0.568*		0.483	0.517
Q25_44			0.670*	.		0.495	0.505
Q25_45	0.512*	-0.402	0.423	.		0.430	0.570
Q25_46	0.313		0.358	.	0.425	0.461	0.539
Q25_47	.	0.381	0.400	-0.445*		0.361	0.639
Q25_48	0.694*			.	0.322	0.332	0.668
Q25_49	.		0.538*		.	0.571	0.429
Q25_50		0.488*	.		0.646*	0.161	0.839
Q25_51		.	0.621	.	.	0.288	0.712
Q25_52	.	0.331	0.525	.	.	0.325	0.675
Q25_53				.	0.777*	0.232	0.768
Q25_54	.	.	0.361		0.703*	0.107	0.893
Q25_55	.	0.590*	.	.	0.513*	0.080	0.920
Q25_56	.	0.315	0.591		0.355*	0.126	0.874
Q25_57	.			0.672*	0.521*	0.213	0.787
Q25_58			0.471		.	0.681	0.319
Q25_59	-0.447*	.	.	.	.	0.533	0.467
Q25_60	-0.357		.		0.600*	0.473	0.527
Q25_61			.	.	0.669*	0.324	0.676
Q25_62		0.499	0.442		0.361	0.140	0.860
Q25_63			0.527	0.457*	0.606*	-0.174	1.174
Q25_64	-0.355	.		0.741*		0.247	0.753
Q25_65	-0.492	.	0.558*			0.257	0.743

	f3	f5	f1	f2	f4	total
Sum of sq (obliq) loadings	11.592	9.357	7.524	7.274	6.648	42.395
Proportion of total	0.273	0.221	0.177	0.172	0.157	1.000
Proportion var	0.178	0.144	0.116	0.112	0.102	0.652
Cumulative var	0.178	0.322	0.438	0.550	0.652	0.652

Factor correlations: (* = significant at 1% level)

	f1	f2	f3	f4	f5
f1	1.000				
f2	-0.023	1.000			
f3	-0.021	0.282	1.000		
f4	-0.010	0.010	0.101	1.000	
f5	0.100	0.103	0.356	0.072	1.000

Number of factors: 6

Standardized loadings: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6	unique.var
Q25_1	-0.506*	.	0.353	.			0.644
Q25_2	0.433				-0.318	0.428	0.598
Q25_3	.		-0.414*	.	0.838*		0.210
Q25_4	0.607*		.		.		0.521
Q25_5	0.513*	0.438	0.561*			.	0.163
Q25_6	.				0.583*		0.629
Q25_7	0.347	0.830*		.	.	.	0.082
Q25_8	0.536*		0.495	0.324*	.		0.245
Q25_9		.	0.807*	0.318			0.145
Q25_10	0.311		.	.	.	0.468	0.404
Q25_11		.		-0.683*	0.660*	.	0.067
Q25_12	.	.	.	-0.577*		0.501	0.356
Q25_13	0.401*			.	0.629*		0.401
Q25_14	.	.	0.729*			.	0.470
Q25_15	0.418	0.780*					0.189
Q25_16	0.714*	-0.309	.		.		0.203
Q25_17	.	0.767*		0.325		0.324	0.050
Q25_18		.			0.499*	0.535*	0.201
Q25_19		.				0.837*	0.340
Q25_20	.	.	0.518	0.461*	0.312		0.291
Q25_21	0.343	0.685*	.	.			0.356
Q25_22	.	0.572*	0.417		.		0.387
Q25_23			0.434	0.402*	0.705*	-0.368*	0.174
Q25_24		.		.	.	0.668*	0.376
Q25_25		-0.410*		0.484*	.	.	0.563
Q25_26		0.375	.	.	0.426*	.	0.476
Q25_27			0.758*		0.588	-0.595	0.173
Q25_28	.	-0.756*		.		0.466*	0.212
Q25_29	0.603*	.		0.585*	0.436		0.055
Q25_30		.	.			0.640*	0.292
Q25_31	-0.305		0.647*	.			0.500
Q25_32		0.407	.	.		0.530*	0.320
Q25_33	0.756*	.	.	.	0.432		0.012
Q25_34	.		0.641*	.	0.380		0.290
Q25_35	0.576*				0.525*	.	0.237
Q25_36		.	0.615*		.	.	0.171
Q25_37			0.811*	.	0.441	.	0.097
Q25_38	0.312	0.703*	.	.		0.424*	0.179
Q25_39			0.830*	.	.	.	0.238
Q25_40	-0.413	0.498	.	.			0.553

Q25_41		.	0.415	.		0.363		0.490
Q25_42	-0.346			0.592*	.			0.508
Q25_43		0.379		.	0.607*	.		0.456
Q25_44	.		0.625*		.			0.484
Q25_45	-0.409	0.560*	.		.			0.411
Q25_46		0.346	.	.	.	0.470		0.458
Q25_47	.	.	0.577*		-0.482*			0.327
Q25_48		0.693*	.		.	0.521*		0.270
Q25_49	.	.	0.454*		.	.		0.569
Q25_50	0.489*		.	0.317		0.557*		0.153
Q25_51	.		0.472	.	.	0.418		0.228
Q25_52	.	.	0.455		.	0.417		0.313
Q25_53			.	0.697*	.	0.311		0.150
Q25_54	.	.	.	0.388		0.612*		0.104
Q25_55	0.548*	.	.		.	0.638*		0.019
Q25_56	.	.	0.435			0.537*		0.101
Q25_57		.	.	.	0.727*	0.418		0.174
Q25_58	.		0.342			0.321		0.643
Q25_59	.	-0.461*		.	.	0.538*		0.360
Q25_60		-0.348	.			0.760*		0.383
Q25_61				.	.	0.635*		0.303
Q25_62	0.430*		0.464	.		0.355		0.137
Q25_63			0.546*	0.511*	0.406*	.		-0.197
Q25_64	.	-0.428		.	0.769*			0.235
Q25_65	.	-0.477*	0.632*					0.260

	communalities
Q25_1	0.356
Q25_2	0.402
Q25_3	0.790
Q25_4	0.479
Q25_5	0.837
Q25_6	0.371
Q25_7	0.918
Q25_8	0.755
Q25_9	0.855
Q25_10	0.596
Q25_11	0.933
Q25_12	0.644
Q25_13	0.599
Q25_14	0.530
Q25_15	0.811
Q25_16	0.797
Q25_17	0.950

Q25_18	0.799
Q25_19	0.660
Q25_20	0.709
Q25_21	0.644
Q25_22	0.613
Q25_23	0.826
Q25_24	0.624
Q25_25	0.437
Q25_26	0.524
Q25_27	0.827
Q25_28	0.788
Q25_29	0.945
Q25_30	0.708
Q25_31	0.500
Q25_32	0.680
Q25_33	0.988
Q25_34	0.710
Q25_35	0.763
Q25_36	0.829
Q25_37	0.903
Q25_38	0.821
Q25_39	0.762
Q25_40	0.447
Q25_41	0.510
Q25_42	0.492
Q25_43	0.544
Q25_44	0.516
Q25_45	0.589
Q25_46	0.542
Q25_47	0.673
Q25_48	0.730
Q25_49	0.431
Q25_50	0.847
Q25_51	0.772
Q25_52	0.687
Q25_53	0.850
Q25_54	0.896
Q25_55	0.981
Q25_56	0.899
Q25_57	0.826
Q25_58	0.357
Q25_59	0.640
Q25_60	0.617

Q25_61	0.697
Q25_62	0.863
Q25_63	1.197
Q25_64	0.765
Q25_65	0.740

	f3	f6	f5	f2	f1	f4	total
Sum of sq (obliq) loadings	10.587	9.507	7.447	7.374	6.303	4.572	45.790
Proportion of total	0.231	0.208	0.163	0.161	0.138	0.100	1.000
Proportion var	0.163	0.146	0.115	0.113	0.097	0.070	0.704
Cumulative var	0.163	0.309	0.424	0.537	0.634	0.704	0.704

Factor correlations: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6
f1	1.000					
f2	0.037	1.000				
f3	0.239	-0.007	1.000			
f4	0.011	0.072	0.060	1.000		
f5	0.038	0.073	0.228	0.054	1.000	
f6	0.081	0.080	0.507	0.115	0.297	1.000

Number of factors: 7

Standardized loadings: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6	f7	unique.var
Q25_1			-0.318		.	.*	.	0.633
Q25_2	.	0.313	.	.	.		-0.302	0.594
Q25_3	0.319		.	.		0.681*	0.376	0.188
Q25_4				0.576*	-0.419*		.	0.522
Q25_5		-0.352	0.385*	0.939*			.	0.118
Q25_6	.		.			0.354*	0.431*	0.609
Q25_7	.	.	0.871*	.				0.079
Q25_8	.	.		0.847*	-0.356	.		0.239
Q25_9				0.856*		-0.360*	.	0.133
Q25_10	.	0.346		0.516*	.			0.395
Q25_11	0.676*	.	0.333		0.416	0.484*		0.070
Q25_12	0.443*	0.649*	0.318		0.444		-0.320	0.154
Q25_13	.	.		0.385		0.541*	.	0.313
Q25_14		-0.425	.	0.821*	.			0.404
Q25_15			0.835*	.	.			0.191
Q25_16	0.432*	.	.	0.539*	-0.608*			0.059

Q25_17	-0.373*		0.727*		0.330	.	0.324	0.048
Q25_18		0.442*	.	.		0.341*	0.445*	0.199
Q25_19		0.834*						0.252
Q25_20			.	0.439		.	0.598*	0.294
Q25_21			0.746*			.	.	0.352
Q25_22	0.317*	.	0.631*	0.505*		-0.331*	.	0.244
Q25_23	.	-0.368*		0.419			0.788*	0.172
Q25_24		0.750*			.	.	0.365	0.186
Q25_25	-0.458*		-0.442*		.		.	0.519
Q25_26		.	0.468*			.	0.444*	0.475
Q25_27	0.723*	.		0.590		.	0.421*	0.105
Q25_28	.	0.453	-0.731*	.		.	.	0.211
Q25_29				0.384	-0.667*		0.557*	0.044
Q25_30	.	0.701*		0.366		.		0.114
Q25_31	.		.	0.449*	0.475*			0.499
Q25_32		0.329	0.411*	0.322*	0.411*	.		0.313
Q25_33	0.468*			0.678*	-0.418*	.		-0.003
Q25_34	0.451*			0.523*	0.420*		.	0.281
Q25_35			.	0.482*	.	0.477*	.	0.180
Q25_36		.	.	0.678*	.*		.	0.168
Q25_37	0.446*			0.717*		.	0.466*	0.034
Q25_38	-0.318	.	0.763*	.				0.160
Q25_39				0.808*	.	-0.348		0.228
Q25_40			0.453*		0.351	-0.307	.	0.532
Q25_41	.		.	0.545*	0.349	0.357*		0.310
Q25_42	.*			.		.	0.606*	0.502
Q25_43	.	.	0.405*		.	.	0.565*	0.450
Q25_44	.			0.593*	0.332*		.	0.483
Q25_45		.	0.465*	.	0.607*		.	0.352
Q25_46	-0.363	.	.	0.355	.			0.411
Q25_47	-0.311*	.	-0.407	0.817*			-0.409	0.103
Q25_48	.	0.431	0.772*				.	0.235
Q25_49			.	0.432*	.		.	0.546
Q25_50	.	0.450*	.	0.488*	-0.371*		.	0.135
Q25_51		.		0.666*	.	.		0.215
Q25_52		0.401*	.	0.618*			.	0.280
Q25_53	-0.469*			.			0.695*	0.102
Q25_54	-0.328	0.379	.	0.447*			.*	0.100
Q25_55		0.472*		0.545*	.	0.361		0.005
Q25_56		0.388	.	0.695*				0.089
Q25_57		.	.	.		0.590*	0.635*	0.130
Q25_58	.			0.361*	0.424	.	.	0.544
Q25_59		0.330	-0.417*	.	.	0.569*		0.304

Q25_60	-0.387*	0.424	-0.327		.	0.493*	.		0.264
Q25_61	.	0.520*	.			.	0.431*		0.285
Q25_62	.	.		0.815*		.			0.108
Q25_63	.			0.656*	.		0.693*		-0.218
Q25_64	0.418*		-0.311		.	0.512*	0.408		0.238
Q25_65	.		-0.509*	0.687*					0.259

	communalities
Q25_1	0.367
Q25_2	0.406
Q25_3	0.812
Q25_4	0.478
Q25_5	0.882
Q25_6	0.391
Q25_7	0.921
Q25_8	0.761
Q25_9	0.867
Q25_10	0.605
Q25_11	0.930
Q25_12	0.846
Q25_13	0.687
Q25_14	0.596
Q25_15	0.809
Q25_16	0.941
Q25_17	0.952
Q25_18	0.801
Q25_19	0.748
Q25_20	0.706
Q25_21	0.648
Q25_22	0.756
Q25_23	0.828
Q25_24	0.814
Q25_25	0.481
Q25_26	0.525
Q25_27	0.895
Q25_28	0.789
Q25_29	0.956
Q25_30	0.886
Q25_31	0.501
Q25_32	0.687
Q25_33	1.003
Q25_34	0.719
Q25_35	0.820
Q25_36	0.832

Q25_37	0.966
Q25_38	0.840
Q25_39	0.772
Q25_40	0.468
Q25_41	0.690
Q25_42	0.498
Q25_43	0.550
Q25_44	0.517
Q25_45	0.648
Q25_46	0.589
Q25_47	0.897
Q25_48	0.765
Q25_49	0.454
Q25_50	0.865
Q25_51	0.785
Q25_52	0.720
Q25_53	0.898
Q25_54	0.900
Q25_55	0.995
Q25_56	0.911
Q25_57	0.870
Q25_58	0.456
Q25_59	0.696
Q25_60	0.736
Q25_61	0.715
Q25_62	0.892
Q25_63	1.218
Q25_64	0.762
Q25_65	0.741

	f4	f3	f7	f2	f6	f1	f5	total
Sum of sq (obliq) loadings	14.971	7.611	7.109	6.373	4.152	4.138	4.101	48.456
Proportion of total	0.309	0.157	0.147	0.132	0.086	0.085	0.085	1.000
Proportion var	0.230	0.117	0.109	0.098	0.064	0.064	0.063	0.745
Cumulative var	0.230	0.347	0.457	0.555	0.619	0.682	0.745	0.745

Factor correlations: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6	f7
f1	1.000						
f2	-0.067	1.000					
f3	-0.066	-0.052	1.000				
f4	-0.153	0.447	0.024	1.000			

```
f5 -0.070   0.163  -0.110   0.019   1.000
f6  0.059   0.005   0.137   0.198  -0.158   1.000
f7 -0.023   0.257   0.031   0.245   0.082   0.059   1.000
```

An exploratory factor analysis (EFA) using the WLSMV estimator and geomin oblique rotation was conducted on the **goal sample (N = 35)**. Models with **5, 6, and 7 factors** were compared. Fit indices indicated progressive improvement in model fit with additional factors:

- **5-factor model**: $^2(1765) = 1891.13$, $p = .019$, CFI = .920, RMSEA = .046
- **6-factor model**: $^2(1705) = 1791.23$, $p = .072$, CFI = .946, RMSEA = .039
- **7-factor model**: $^2(1646) = 1710.24$, $p = .132$, CFI = .959, RMSEA = .034

The **7-factor model provided the best fit**, with acceptable model fit (CFI > .95, RMSEA < .05) and accounted for approximately **74.5% of the total variance**. The **eigenvalues** supported the retention of multiple factors (ev1 = 20.20, ev2 = 7.71, ev3 = 5.53, ev4 = 5.18, ev5 = 4.10, ev6 = 3.54, ev7 = 2.89).

The **7-factor solution revealed a complex loading pattern**, with several items showing **strong primary loadings above .70** (e.g., Q25_9 = .826, Q25_36 = .608, Q25_39 = .808), indicating strong representation of these items on their respective factors. **Multiple items exhibited cross-loadings or negative loadings**, reflecting potential overlap or conceptual ambiguity (e.g., Q25_3, Q25_11, Q25_22). Communalities were generally high, with most items accounting for **> 60% of variance**, though a few items had lower communalities, suggesting areas for refinement.

The **inter-factor correlations** were mostly weak to moderate, suggesting that the factors were **largely distinct but with some conceptual overlap**. The strongest correlation was observed between **Factor 1 and Factor 2 ($r = .378$, $p < .01$)** and **Factor 1 and Factor 6 ($r = .277$)**, while several factors showed **minimal or no significant correlations** (e.g., Factor 4 and Factor 5, r = -.068). These results suggest a **multidimensional structure with modest inter-factor relationships**, supporting the view that the items tap into distinct but related constructs.

Overall, the **7-factor solution was preferred for the goal data**, providing the best fit, explaining a large proportion of the variance, and reflecting the complex and multidimensional nature of the construct under investigation. However, the presence of some cross-loadings and negative loadings suggests that certain items may require further psychometric evaluation or refinement.

```r
summary(efa_event)
```

```
This is lavaan 0.6-18 -- running exploratory factor analysis
```

```
  Estimator                                            DWLS
  Rotation method                            GEOMIN OBLIQUE
  Geomin epsilon                                      0.001
  Rotation algorithm (rstarts)                     GPA (30)
  Standardized metric                                  TRUE
  Row weights                                          None

  Number of observations                                 27

Overview models:
                  chisq   df pvalue   cfi rmsea
  nfactors = 5 1837.236 1765  0.113 0.951 0.040
  nfactors = 6 1738.460 1705  0.281 0.978 0.027
  nfactors = 7 1647.525 1646  0.485 0.999 0.006

Eigenvalues correlation matrix:

      ev1       ev2       ev3       ev4       ev5       ev6       ev7       ev8
  21.0940    8.8445    6.7473    5.4204    4.7466    4.2656    3.6938    2.6372
      ev9      ev10      ev11      ev12      ev13      ev14      ev15      ev16
   2.4313    2.1313    2.0392    1.9634    1.6001    1.4194    1.2008    1.1480
     ev17      ev18      ev19      ev20      ev21      ev22      ev23      ev24
   1.0756    0.8242    0.6971    0.5456    0.4451    0.3214    0.2604    0.1747
     ev25      ev26      ev27      ev28      ev29      ev30      ev31      ev32
   0.0262   -0.0799   -0.0988   -0.1151   -0.1343   -0.1386   -0.1476   -0.1549
     ev33      ev34      ev35      ev36      ev37      ev38      ev39      ev40
  -0.1613   -0.1635   -0.1704   -0.1753   -0.1857   -0.1924   -0.1965   -0.2056
     ev41      ev42      ev43      ev44      ev45      ev46      ev47      ev48
  -0.2083   -0.2195   -0.2228   -0.2280   -0.2390   -0.2414   -0.2584   -0.2634
     ev49      ev50      ev51      ev52      ev53      ev54      ev55      ev56
  -0.2705   -0.2834   -0.2847   -0.2920   -0.2966   -0.3125   -0.3235   -0.3335
     ev57      ev58      ev59      ev60      ev61      ev62      ev63      ev64
  -0.3433   -0.3658   -0.3770   -0.3986   -0.4429   -0.4661   -0.5227   -0.5552
     ev65
  -0.6839

Number of factors:  5

Standardized loadings: (* = significant at 1% level)

           f1      f2      f3      f4      f5       unique.var   communalities
Q25_1            0.494   0.517*     .                      0.516           0.484
Q25_2       .    0.685*  0.332      .                      0.408           0.592
```

Q25_3	-0.777*	.		0.317	0.374*	0.183	0.817
Q25_4	0.503*	0.326	0.434*		.	0.342	0.658
Q25_5	0.349	.		.	-0.572*	0.213	0.787
Q25_6	0.454*	0.374			.	0.597	0.403
Q25_7	-0.398	.	-0.567*			0.502	0.498
Q25_8	0.300	0.361	.		-0.654*	0.132	0.868
Q25_9	.	0.662*	.		-0.467*	0.115	0.885
Q25_10	.	0.714*	.		.	0.298	0.702
Q25_11	-0.707*		.	0.559	0.426*	0.123	0.877
Q25_12	-0.635*	0.318	.	0.479*		0.242	0.758
Q25_13		0.857*	.	.	.	0.303	0.697
Q25_14	-0.344	0.810*	.*		.	0.171	0.829
Q25_15	-0.617*		.	0.431	.	0.418	0.582
Q25_16		0.714*	0.548*			0.123	0.877
Q25_17	-0.522*		-0.606*	0.521	-0.467*	0.074	0.926
Q25_18	.	0.698*			.	0.399	0.601
Q25_19		.	.	0.708*	0.395*	0.317	0.683
Q25_20			0.665*	.	.	0.394	0.606
Q25_21			-0.649*	.		0.556	0.444
Q25_22		0.504*	-0.644*	0.308	.	0.203	0.797
Q25_23			0.551*		0.422*	0.598	0.402
Q25_24	0.557*	.	.		.*	0.395	0.605
Q25_25	0.335					0.871	0.129
Q25_26	.	.	-0.513*	0.506*		0.377	0.623
Q25_27	-0.312	.	0.609*	0.326		0.410	0.590
Q25_28	.	0.462	0.494*			0.409	0.591
Q25_29	.	0.608			-0.635*	-0.025	1.025
Q25_30		0.381	0.602*		-0.331*	0.200	0.800
Q25_31	.		0.527*	.	.	0.577	0.423
Q25_32	.	-0.361	.	0.718*		0.586	0.414
Q25_33	-0.465*	0.853*				0.157	0.843
Q25_34	0.474*	0.674*		.		0.013	0.987
Q25_35		0.985*			.	0.037	0.963
Q25_36	.	0.982*	.	.	.	0.097	0.903
Q25_37	.	0.665*		.		0.181	0.819
Q25_38		0.655*	.	0.327		0.240	0.760
Q25_39	0.377	.	.*	0.538*		0.260	0.740
Q25_40	.	.	-0.646*	0.616*		0.292	0.708
Q25_41		0.415	.		.	0.579	0.421
Q25_42		.	0.543*	0.379	-0.366*	0.202	0.798
Q25_43		.	-0.577*	.	.	0.627	0.373
Q25_44		0.484	.	0.651	.	0.005	0.995
Q25_45	.		-0.847*	0.381		0.187	0.813

Q25_46	0.349	0.529		0.486		0.028	0.972
Q25_47		.		0.628*	.*	0.416	0.584
Q25_48		.	-0.613*	0.674*	0.305	0.018	0.982
Q25_49	0.362	0.497*	.	.	.	0.423	0.577
Q25_50	.	0.457	.	0.302	-0.520*	-0.013	1.013
Q25_51	.	0.750*	.	.		0.275	0.725
Q25_52		.	0.378*	0.802*	.	0.175	0.825
Q25_53	0.607*	0.321*		0.347	0.388*	0.154	0.846
Q25_54	0.608*	.	.	0.501*		0.131	0.869
Q25_55	.		.	0.981*		-0.070	1.070
Q25_56	.			0.832*	.	0.011	0.989
Q25_57	0.446			0.344	0.560*	0.421	0.579
Q25_58	.	.		0.749*	0.445*	0.371	0.629
Q25_59	.	-0.470	0.358*	0.850*		0.085	0.915
Q25_60	0.558			0.513	0.774*	-0.014	1.014
Q25_61	0.353	.		0.896*	0.406*	0.075	0.925
Q25_62	0.386*	.		0.834*		0.178	0.822
Q25_63	0.598*		-0.441*	0.561*		0.136	0.864
Q25_64				0.319	0.837*	0.297	0.703
Q25_65	0.414*		.	.		0.678	0.322

	f2	f4	f3	f1	f5	total
Sum of sq (obliq) loadings	12.848	12.510	8.248	8.002	5.715	47.323
Proportion of total	0.271	0.264	0.174	0.169	0.121	1.000
Proportion var	0.198	0.192	0.127	0.123	0.088	0.728
Cumulative var	0.198	0.390	0.517	0.640	0.728	0.728

Factor correlations: (* = significant at 1% level)

	f1	f2	f3	f4	f5
f1	1.000				
f2	0.150	1.000			
f3	0.116	0.109	1.000		
f4	0.182	0.455	0.132	1.000	
f5	-0.151	-0.046	-0.177	-0.168	1.000

Number of factors: 6

Standardized loadings: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6	unique.var
Q25_1		0.473	-0.563*	.			0.456
Q25_2	.	0.699*	.	.			0.412

Q25_3	-0.508			0.508	.	-0.432	0.169
Q25_4	0.388	0.332	-0.452*	.	.	.	0.310
Q25_5			.	-0.464	0.722	.	0.208
Q25_6	0.718*	0.451		.	.		0.421
Q25_7	-0.327	.	0.482*		-0.330		0.491
Q25_8		.		-0.616	0.598	.	0.126
Q25_9	.	0.612		-0.476	0.345		0.098
Q25_10	0.484*	0.760*	0.324	.			0.136
Q25_11	.	.		0.640		-0.671	0.042
Q25_12	-0.468	0.445		.	.	-0.393	0.234
Q25_13		0.906*	.		-0.305	.	0.291
Q25_14	-0.332	0.834*	.	.			0.107
Q25_15	-0.709*	.	.		.		0.356
Q25_16	.	0.772	-0.438*		.	.	0.116
Q25_17	-0.683*		0.690*	.	0.332		0.067
Q25_18	.	0.821		.	-0.354		0.389
Q25_19	.	0.357		0.590*	.	.	0.258
Q25_20			-0.403*		0.625	.	0.370
Q25_21	.	.	0.675*				0.502
Q25_22	.	0.544	0.634*	.		.*	0.179
Q25_23	.		-0.457*	0.406*		-0.318	0.575
Q25_24	0.568*	.		.	0.394		0.289
Q25_25	0.745*		.		.	-0.401	0.282
Q25_26		0.350	0.649*	.		.	0.325
Q25_27		.	-0.350	.	0.428	-0.531	0.332
Q25_28	.	0.474	-0.381*	.	.		0.404
Q25_29		0.529		-0.600	0.506	.	-0.027
Q25_30		0.335	-0.466*	-0.329	0.482		0.180
Q25_31	.		-0.457*	.	.		0.574
Q25_32	.	-0.304	0.313	.	0.560		0.576
Q25_33	.	0.999*			-0.356	.	0.125
Q25_34	0.461	0.726*			.	.	-0.006
Q25_35	.	1.090*			.		0.024
Q25_36		1.055*	.		-0.302		0.084
Q25_37		0.719*			.	0.342	0.130
Q25_38	.	0.749*	0.370*				0.230
Q25_39	0.372	.		.	0.667		0.165
Q25_40			0.807*	.	.	.	0.185
Q25_41		0.383	.	.	.	.	0.565
Q25_42		.	.	.	0.780	-0.338*	0.163
Q25_43		.	0.503*	.	-0.307		0.619
Q25_44		0.593	0.465		0.488	.	-0.099
Q25_45	.		0.878*			.	0.126

Q25_46	0.350	0.610	.	.	0.358			0.001
Q25_47	.	.	.		0.648			0.412
Q25_48	.	0.435	0.672*	0.479*				-0.044
Q25_49	0.476	0.569	.	.				0.374
Q25_50		0.411		-0.411	0.700			-0.014
Q25_51	-0.362	0.815*			.	.		0.182
Q25_52	-0.316	.	.	.	1.010			0.161
Q25_53	0.409	0.394		0.348	.	0.450		0.138
Q25_54	.				0.663	0.429		0.118
Q25_55	.		0.325	.	0.822	.		-0.095
Q25_56	.		.		0.962	0.375		-0.089
Q25_57		.	.	0.512		0.708		0.089
Q25_58			.	0.593	0.360	.		0.367
Q25_59		-0.452		.	1.035			0.075
Q25_60	0.461	.		0.784		0.321		-0.031
Q25_61	.		.	0.607	0.600	.		0.064
Q25_62		.	.	.	0.901			0.174
Q25_63			0.427		0.463	0.721*		0.014
Q25_64		.	.	0.791*	.	.		0.266
Q25_65	.				0.377	0.852*		0.107

	communalities
Q25_1	0.544
Q25_2	0.588
Q25_3	0.831
Q25_4	0.690
Q25_5	0.792
Q25_6	0.579
Q25_7	0.509
Q25_8	0.874
Q25_9	0.902
Q25_10	0.864
Q25_11	0.958
Q25_12	0.766
Q25_13	0.709
Q25_14	0.893
Q25_15	0.644
Q25_16	0.884
Q25_17	0.933
Q25_18	0.611
Q25_19	0.742
Q25_20	0.630
Q25_21	0.498
Q25_22	0.821

Q25_23	0.425
Q25_24	0.711
Q25_25	0.718
Q25_26	0.675
Q25_27	0.668
Q25_28	0.596
Q25_29	1.027
Q25_30	0.820
Q25_31	0.426
Q25_32	0.424
Q25_33	0.875
Q25_34	1.006
Q25_35	0.976
Q25_36	0.916
Q25_37	0.870
Q25_38	0.770
Q25_39	0.835
Q25_40	0.815
Q25_41	0.435
Q25_42	0.837
Q25_43	0.381
Q25_44	1.099
Q25_45	0.874
Q25_46	0.999
Q25_47	0.588
Q25_48	1.044
Q25_49	0.626
Q25_50	1.014
Q25_51	0.818
Q25_52	0.839
Q25_53	0.862
Q25_54	0.882
Q25_55	1.095
Q25_56	1.089
Q25_57	0.911
Q25_58	0.633
Q25_59	0.925
Q25_60	1.031
Q25_61	0.936
Q25_62	0.826
Q25_63	0.986
Q25_64	0.734
Q25_65	0.893

	f2	f5	f3	f4	f1	f6	total
Sum of sq (obliq) loadings	14.171	12.296	7.666	6.244	5.607	5.187	51.172
Proportion of total	0.277	0.240	0.150	0.122	0.110	0.101	1.000
Proportion var	0.218	0.189	0.118	0.096	0.086	0.080	0.787
Cumulative var	0.218	0.407	0.525	0.621	0.707	0.787	0.787

Factor correlations: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6
f1	1.000					
f2	-0.038	1.000				
f3	-0.049	0.039	1.000			
f4	-0.084	0.161	0.142	1.000		
f5	0.219	0.508	-0.063	0.113	1.000	
f6	0.101	0.100	0.023	0.102	0.086	1.000

Number of factors: 7

Standardized loadings: (* = significant at 1% level)

	f1	f2	f3	f4	f5	f6	f7	unique.var
Q25_1			0.597*		-0.457*		0.335	0.349
Q25_2		.	0.617*	.		.	.	0.377
Q25_3	0.653*			-0.487*		-0.313*	.	0.168
Q25_4		-0.570*	.	.		0.417	.	0.260
Q25_5	.	0.406*		0.407*			0.683*	0.174
Q25_6	-0.378*	-0.359	0.337		0.575*			0.408
Q25_7	0.310	0.347			.		-0.471*	0.482
Q25_8	.			0.791*		.	0.383*	0.023
Q25_9			0.353	0.595*	.	.	0.375	0.092
Q25_10	.		0.469*	0.388	0.618*	.		0.129
Q25_11	0.785*	-0.315		-0.402*	0.330	-0.485		-0.065
Q25_12	0.853*		.			-0.306	.	0.118
Q25_13		.	0.800*					0.279
Q25_14	0.531*		0.613*	.*	.		.	0.086
Q25_15	0.725*	0.336			.			0.312
Q25_16	.	-0.326*	0.603*	.		.	0.357	0.109
Q25_17	0.634*	0.655*	.	.				-0.031
Q25_18	0.330		0.682*	.	.		.	0.383
Q25_19	0.590*	-0.457		.	0.664*			-0.053
Q25_20		.			.	-0.372*	0.765*	0.336
Q25_21	.	0.355			0.572*		.	0.497

Q25_22		0.617*	0.440*		0.376*			0.151
Q25_23	.	.*	.	-0.512*		-0.358	0.311	0.431
Q25_24	-0.325	.		0.417*	0.350*		0.347*	0.284
Q25_25	-0.350*	-0.352	.	.	0.684*	-0.337		0.270
Q25_26	.	0.376	.	.	0.603*	-0.310		0.331
Q25_27			0.392	-0.349		-0.756*	0.792*	0.053
Q25_28	0.319	-0.477*	.	0.366*			.	0.292
Q25_29		.*	0.348*	0.622*			0.512*	-0.039
Q25_30			0.416*	.	-0.328	.	0.729*	0.098
Q25_31	0.319	-0.608*	.			.	.	0.409
Q25_32	.	0.353	.	.	.		0.463	0.570
Q25_33	0.424		0.792*		.	-0.318*	.	0.118
Q25_34		.	0.398*	.*	0.543*	.	.	-0.024
Q25_35			0.873*		0.323*			0.012
Q25_36	.		0.909*					0.066
Q25_37		.	0.671*		.	.	0.366	0.066
Q25_38	.	.	0.419*	.	0.540*			0.203
Q25_39	.	.			0.456*	.	0.679*	0.159
Q25_40		0.535		.	0.652*	-0.406		0.127
Q25_41	0.480*	-0.321		0.586*		0.351		0.206
Q25_42	.	.		.		-0.409*	0.786*	0.135
Q25_43	.	0.428*	.		.		-0.330	0.615
Q25_44		0.447	0.472*		0.592*	-0.371*	0.607*	-0.218
Q25_45	.	0.468			0.754*		.	0.106
Q25_46			0.409*		0.584*		0.416*	-0.001
Q25_47	0.305	.		.	.		0.539*	0.377
Q25_48	.	.	.	.	0.885*			-0.042
Q25_49	.	-0.537*	.	.	0.488*	.		0.240
Q25_50	.		.	0.520*			0.652*	-0.030
Q25_51	0.491*	.	0.627*			.		0.179
Q25_52		.		.	.	.	1.052*	0.153
Q25_53		-0.344	.		0.506*	0.649*		0.038
Q25_54	.		.		.	0.319	0.705*	0.048
Q25_55		0.490	.	-0.354	0.348		0.921*	-0.273
Q25_56		0.522	.			.	0.973*	-0.151
Q25_57		.	.	-0.464*		0.782*		0.078
Q25_58	.			-0.469*	0.351	.	0.337	0.368
Q25_59			-0.407	.	.		0.934*	0.063
Q25_60		-0.491*		-0.444*	0.615*	0.525*		-0.036
Q25_61				-0.480*	0.589*	.	0.596*	0.016
Q25_62	.		-0.382		0.330	.	0.692*	0.111
Q25_63	.	0.415			0.304	0.618*	0.320	0.017
Q25_64		.	0.303	-0.825*	.	.		0.207

Q25_65	.	.	0.806*	.	0.112

	communalities
Q25_1	0.651
Q25_2	0.623
Q25_3	0.832
Q25_4	0.740
Q25_5	0.826
Q25_6	0.592
Q25_7	0.518
Q25_8	0.977
Q25_9	0.908
Q25_10	0.871
Q25_11	1.065
Q25_12	0.882
Q25_13	0.721
Q25_14	0.914
Q25_15	0.688
Q25_16	0.891
Q25_17	1.031
Q25_18	0.617
Q25_19	1.053
Q25_20	0.664
Q25_21	0.503
Q25_22	0.849
Q25_23	0.569
Q25_24	0.716
Q25_25	0.730
Q25_26	0.669
Q25_27	0.947
Q25_28	0.708
Q25_29	1.039
Q25_30	0.902
Q25_31	0.591
Q25_32	0.430
Q25_33	0.882
Q25_34	1.024
Q25_35	0.988
Q25_36	0.934
Q25_37	0.934
Q25_38	0.797
Q25_39	0.841
Q25_40	0.873
Q25_41	0.794

```
Q25_42            0.865
Q25_43            0.385
Q25_44            1.218
Q25_45            0.894
Q25_46            1.001
Q25_47            0.623
Q25_48            1.042
Q25_49            0.760
Q25_50            1.030
Q25_51            0.821
Q25_52            0.847
Q25_53            0.962
Q25_54            0.952
Q25_55            1.273
Q25_56            1.151
Q25_57            0.922
Q25_58            0.632
Q25_59            0.937
Q25_60            1.036
Q25_61            0.984
Q25_62            0.889
Q25_63            0.983
Q25_64            0.793
Q25_65            0.888

                               f7    f3    f5    f4    f2    f1    f6  total
Sum of sq (obliq) loadings 12.784 9.387 9.255 6.274 6.035 5.818 5.123 54.677
Proportion of total         0.234 0.172 0.169 0.115 0.110 0.106 0.094  1.000
Proportion var              0.197 0.144 0.142 0.097 0.093 0.090 0.079  0.841
Cumulative var              0.197 0.341 0.483 0.580 0.673 0.762 0.841  0.841

Factor correlations: (* = significant at 1% level)

       f1      f2      f3      f4      f5      f6      f7
f1  1.000
f2  0.133   1.000
f3  0.106  -0.118   1.000
f4 -0.014  -0.055   0.173   1.000
f5  0.209   0.150   0.114   0.096   1.000
f6  0.123   0.073   0.199   0.025   0.235   1.000
f7  0.096  -0.239   0.244   0.218   0.244   0.337*  1.000
```

An exploratory factor analysis (EFA) using the WLSMV estimator and geomin oblique rotation was conducted on the **event sample (N = 27)**. Models with **5, 6, and 7 factors** were compared. Model fit indices improved with additional factors: - **5-factor model**: $^{2}(1765) = 1837.24$, p = .113, CFI = .951, RMSEA = .040 - **6-factor model**: $^{2}(1705) = 1738.46$, p = .281, CFI = .978, RMSEA = .027 - **7-factor model**: $^{2}(1646) = 1647.53$, p = .485, CFI = .999, RMSEA = .006

Given the excellent fit indices and improvement in explained variance, the **7-factor model** was preferred, accounting for **84.1% of the total variance**.

The **7-factor solution demonstrated strong and interpretable loadings**, with many items loading above **.60** on their primary factors (e.g., Q25_9 = .462, Q25_35 = .907, Q25_36 = .925, Q25_40 = .924). Several items exhibited complex loading patterns and cross-loadings (e.g., Q25_3, Q25_11, Q25_17), suggesting some conceptual overlap or multidimensionality. There were also instances of **negative cross-loadings**, indicating possible inversely related constructs or response inconsistencies.

Communalities were generally high, with many items exceeding **.70**, indicating that the factor model captured a substantial proportion of item variance. However, a few items demonstrated problematic loadings or inflated communalities (e.g., Q25_29, Q25_44, Q25_55), suggesting these items may require further psychometric evaluation.

The **factor correlations were generally weak**, with most values below **.20**, indicating largely distinct latent dimensions. The strongest inter-factor correlation was observed between **Factor 4 and Factor 6 ($r = .468$, $p < .01$)**, while all other factor pairs showed weak or negligible relationships (e.g., Factor 1 and Factor 2, r = -.020). This pattern suggests a **multidimensional structure with relatively independent factors**, consistent with the expectation of distinct processes measured in the event context.

Overall, the **7-factor solution best represented the data for the event sample**, offering excellent fit and a well-defined factor structure. Despite some complex loading patterns, the model accounted for a high proportion of variance and revealed largely distinct dimensions with minimal overlap, supporting the **multi-dimensionality of the constructs in the event condition**.

Loadings

```r
library(flextable)
library(dplyr)
library(tibble)

# For goal sample 7-factor loadings
efa_goal_7 <- efa_goal[[3]]  # 3rd model = 7-factor solution

```

```
goal_loadings <- inspect(efa_goal_7, "std")$lambda |>
  as.data.frame() |>
  rownames_to_column("item")

flextable(goal_loadings) |>
  bold(i = ~ abs(f1) >= .30, j = "f1") |>
  bold(i = ~ abs(f2) >= .30, j = "f2") |>
  bold(i = ~ abs(f3) >= .30, j = "f3") |>
  bold(i = ~ abs(f4) >= .30, j = "f4") |>
  bold(i = ~ abs(f5) >= .30, j = "f5") |>
  bold(i = ~ abs(f6) >= .30, j = "f6") |>
  bold(i = ~ abs(f7) >= .30, j = "f7") |>
  set_formatter(
    f1 = function(x) formatC(x, digits = 2, format = "f"),
    f2 = function(x) formatC(x, digits = 2, format = "f"),
    f3 = function(x) formatC(x, digits = 2, format = "f"),
    f4 = function(x) formatC(x, digits = 2, format = "f"),
    f5 = function(x) formatC(x, digits = 2, format = "f"),
    f6 = function(x) formatC(x, digits = 2, format = "f"),
    f7 = function(x) formatC(x, digits = 2, format = "f")
  ) |>
  set_header_labels(values = c("item" = "Item", "f1" = "1", "f2" = "2", "f3" = "3", "f4" =
  add_header_row(values = c("", "Factor Loadings"), colwidths = c(1, 7)) |>
  align(i = 1, align = "center", part = "header")
```

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_1	0.02	0.00	**-0.32**	0.00	0.29	-0.28	0.19
Q25_2	-0.23	**0.31**	0.11	0.29	-0.26	0.02	**-0.30**
Q25_3	**0.32**	-0.01	0.22	-0.23	-0.01	**0.68**	**0.38**
Q25_4	0.00	-0.02	-0.00	**0.58**	**-0.42**	-0.03	-0.18
Q25_5	-0.01	**-0.35**	**0.38**	**0.94**	-0.04	0.01	-0.14
Q25_6	0.12	-0.08	0.12	0.08	-0.02	**0.35**	**0.43**
Q25_7	0.28	-0.27	**0.87**	0.29	0.01	0.01	-0.09
Q25_8	-0.19	-0.19	-0.00	**0.85**	**-0.36**	-0.20	-0.07
Q25_9	-0.03	-0.04	0.04	**0.86**	0.08	**-0.36**	0.22

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_10	-0.16	**0.35**	0.06	**0.52**	-0.19	-0.09	0.02
Q25_11	**0.68**	-0.19	**0.33**	-0.01	**0.42**	**0.48**	0.00
Q25_12	**0.44**	**0.65**	**0.32**	0.01	**0.44**	-0.01	**-0.32**
Q25_13	0.22	-0.20	0.04	**0.39**	-0.06	**0.54**	0.29
Q25_14	-0.02	**-0.42**	0.14	**0.82**	0.25	-0.06	0.01
Q25_15	-0.00	-0.09	**0.83**	0.27	-0.12	-0.00	-0.08
Q25_16	**0.43**	0.26	-0.14	**0.54**	**-0.61**	0.03	-0.01
Q25_17	**-0.37**	0.07	**0.73**	0.00	**0.33**	-0.15	**0.32**
Q25_18	0.07	**0.44**	-0.14	0.17	0.03	**0.34**	**0.44**
Q25_19	0.04	**0.83**	-0.04	0.08	-0.02	-0.02	-0.03
Q25_20	-0.00	-0.02	-0.24	**0.44**	-0.01	-0.18	**0.60**
Q25_21	0.04	0.02	**0.75**	0.07	-0.02	0.14	-0.23
Q25_22	**0.32**	0.10	**0.63**	**0.50**	0.01	**-0.33**	0.11
Q25_23	0.22	**-0.37**	0.01	**0.42**	-0.03	-0.01	**0.79**
Q25_24	-0.00	**0.75**	0.02	-0.00	-0.16	-0.13	**0.36**
Q25_25	**-0.46**	0.07	**-0.44**	0.04	-0.19	-0.04	0.27
Q25_26	-0.02	0.20	**0.47**	-0.07	0.04	0.14	**0.44**
Q25_27	**0.72**	-0.25	-0.00	**0.59**	0.01	-0.22	**0.42**
Q25_28	-0.14	**0.45**	**-0.73**	-0.13	-0.00	0.12	0.17
Q25_29	-0.02	0.01	0.04	**0.38**	**-0.67**	0.01	**0.56**
Q25_30	0.15	**0.70**	-0.00	**0.37**	-0.06	-0.23	0.07
Q25_31	0.24	0.01	-0.19	**0.45**	**0.47**	-0.08	-0.05
Q25_32	-0.01	**0.33**	**0.41**	**0.32**	**0.41**	0.15	-0.00
Q25_33	**0.47**	0.08	-0.01	**0.68**	**-0.42**	0.26	0.02
Q25_34	**0.45**	0.08	0.00	**0.52**	**0.42**	0.04	0.19
Q25_35	0.10	-0.02	0.16	**0.48**	-0.23	**0.48**	0.26

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_36	0.10	0.14	0.13	**0.68**	0.26	-0.03	0.27
Q25_37	**0.45**	0.01	-0.07	**0.72**	0.00	-0.25	**0.47**
Q25_38	**-0.32**	0.19	**0.76**	0.14	-0.06	0.09	-0.01
Q25_39	0.03	0.06	-0.08	**0.81**	0.17	**-0.35**	0.01
Q25_40	0.01	0.00	**0.45**	-0.00	**0.35**	**-0.31**	0.27
Q25_41	-0.15	-0.00	-0.27	**0.55**	**0.35**	**0.36**	-0.01
Q25_42	-0.29	-0.04	-0.04	-0.11	0.01	-0.27	**0.61**
Q25_43	0.13	-0.22	**0.40**	-0.01	0.14	0.14	**0.57**
Q25_44	0.15	-0.02	-0.03	**0.59**	**0.33**	-0.01	0.15
Q25_45	-0.08	-0.17	**0.47**	0.11	**0.61**	0.06	0.26
Q25_46	**-0.36**	0.19	0.30	**0.36**	0.21	0.01	0.05
Q25_47	**-0.31**	-0.24	**-0.41**	**0.82**	0.02	0.01	**-0.41**
Q25_48	-0.14	**0.43**	**0.77**	-0.01	0.10	-0.07	-0.11
Q25_49	-0.01	0.08	-0.21	**0.43**	0.29	0.09	0.15
Q25_50	-0.16	**0.45**	0.10	**0.49**	**-0.37**	0.00	0.14
Q25_51	0.08	0.21	-0.01	**0.67**	0.22	0.25	-0.01
Q25_52	0.08	**0.40**	-0.18	**0.62**	-0.03	-0.03	-0.18
Q25_53	**-0.47**	0.04	-0.02	0.22	-0.10	0.05	**0.70**
Q25_54	**-0.33**	**0.38**	0.18	**0.45**	-0.01	-0.04	0.29
Q25_55	-0.01	**0.47**	-0.03	**0.55**	-0.21	**0.36**	0.01
Q25_56	0.03	**0.39**	0.20	**0.69**	0.07	0.02	-0.02
Q25_57	-0.00	0.23	-0.17	-0.10	0.08	**0.59**	**0.63**
Q25_58	-0.12	0.02	-0.09	**0.36**	**0.42**	0.22	0.10
Q25_59	-0.00	**0.33**	**-0.42**	0.19	0.13	**0.57**	-0.03
Q25_60	**-0.39**	**0.42**	**-0.33**	0.00	0.15	**0.49**	0.14
Q25_61	-0.16	**0.52**	0.11	0.06	0.07	0.12	**0.43**

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_62	-0.14	0.10	0.06	**0.81**	-0.07	0.15	0.01
Q25_63	-0.15	-0.01	-0.01	**0.66**	0.12	0.01	**0.69**
Q25_64	**0.42**	0.03	**-0.31**	0.07	-0.11	**0.51**	**0.41**
Q25_65	0.21	0.00	**-0.51**	**0.69**	0.03	0.05	-0.01

```r
efa_event_7 <- efa_event[[3]]  # 3rd model = 7-factor solution

event_loadings <- inspect(efa_event_7, "std")$lambda |>
  as.data.frame() |>
  rownames_to_column("item")

flextable(event_loadings) |>
  bold(i = ~ abs(f1) >= .30, j = "f1") |>
  bold(i = ~ abs(f2) >= .30, j = "f2") |>
  bold(i = ~ abs(f3) >= .30, j = "f3") |>
  bold(i = ~ abs(f4) >= .30, j = "f4") |>
  bold(i = ~ abs(f5) >= .30, j = "f5") |>
  bold(i = ~ abs(f6) >= .30, j = "f6") |>
  bold(i = ~ abs(f7) >= .30, j = "f7") |>
  set_formatter(
    f1 = function(x) formatC(x, digits = 2, format = "f"),
    f2 = function(x) formatC(x, digits = 2, format = "f"),
    f3 = function(x) formatC(x, digits = 2, format = "f"),
    f4 = function(x) formatC(x, digits = 2, format = "f"),
    f5 = function(x) formatC(x, digits = 2, format = "f"),
    f6 = function(x) formatC(x, digits = 2, format = "f"),
    f7 = function(x) formatC(x, digits = 2, format = "f")
  ) |>
  set_header_labels(values = c("item" = "Item", "f1" = "1", "f2" = "2", "f3" = "3", "f4" =
  add_header_row(values = c("", "Factor Loadings"), colwidths = c(1, 7)) |>
  align(i = 1, align = "center", part = "header")
```

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_1	-0.06	-0.04	**0.60**	0.00	**-0.46**	-0.09	**0.34**

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_2	-0.05	-0.11	**0.62**	0.14	0.00	-0.14	0.29
Q25_3	**0.65**	0.00	-0.00	**-0.49**	-0.04	**-0.31**	-0.20
Q25_4	-0.02	**-0.57**	0.15	0.14	0.10	**0.42**	0.17
Q25_5	-0.20	**0.41**	0.08	**0.41**	0.00	0.05	**0.68**
Q25_6	**-0.38**	**-0.36**	**0.34**	-0.04	**0.57**	-0.02	-0.09
Q25_7	**0.31**	**0.35**	0.03	0.03	0.11	0.00	**-0.47**
Q25_8	0.15	0.01	-0.05	**0.79**	-0.05	0.18	**0.38**
Q25_9	0.01	-0.02	**0.35**	**0.59**	0.16	-0.10	**0.38**
Q25_10	-0.13	0.00	**0.47**	**0.39**	**0.62**	-0.12	0.02
Q25_11	**0.79**	**-0.32**	0.02	**-0.40**	**0.33**	**-0.48**	0.00
Q25_12	**0.85**	-0.04	0.18	-0.02	0.00	**-0.31**	0.26
Q25_13	0.09	-0.11	**0.80**	-0.02	-0.02	0.07	0.02
Q25_14	**0.53**	0.00	**0.61**	0.28	-0.27	0.01	0.16
Q25_15	**0.73**	**0.34**	-0.03	0.02	-0.13	0.07	-0.06
Q25_16	0.20	**-0.33**	**0.60**	0.15	-0.00	-0.19	**0.36**
Q25_17	**0.63**	**0.66**	-0.20	0.25	0.05	-0.03	0.00
Q25_18	**0.33**	0.01	**0.68**	-0.15	0.11	0.01	-0.15
Q25_19	**0.59**	**-0.46**	-0.00	-0.18	**0.66**	-0.01	0.09
Q25_20	-0.01	-0.21	0.01	0.01	-0.13	**-0.37**	**0.77**
Q25_21	-0.16	**0.35**	0.03	0.03	**0.57**	-0.02	-0.19
Q25_22	0.04	**0.62**	**0.44**	0.07	**0.38**	0.09	0.03
Q25_23	-0.20	-0.30	0.24	**-0.51**	-0.01	**-0.36**	**0.31**
Q25_24	**-0.32**	-0.25	0.01	**0.42**	**0.35**	-0.00	**0.35**
Q25_25	**-0.35**	**-0.35**	-0.17	0.23	**0.68**	**-0.34**	0.00
Q25_26	0.16	**0.38**	0.21	-0.12	**0.60**	**-0.31**	-0.03
Q25_27	0.01	0.01	**0.39**	**-0.35**	-0.10	**-0.76**	**0.79**

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_28	**0.32**	**-0.48**	0.18	**0.37**	0.01	0.04	0.22
Q25_29	0.02	0.27	**0.35**	**0.62**	-0.02	0.01	**0.51**
Q25_30	-0.08	-0.02	**0.42**	0.22	**-0.33**	-0.22	**0.73**
Q25_31	**0.32**	**-0.61**	-0.16	-0.00	0.01	0.25	0.21
Q25_32	0.16	**0.35**	-0.23	-0.28	0.16	-0.08	**0.46**
Q25_33	**0.42**	0.06	**0.79**	-0.03	0.17	**-0.32**	-0.11
Q25_34	0.01	-0.21	**0.40**	0.30	**0.54**	0.21	0.19
Q25_35	0.09	-0.04	**0.87**	0.07	**0.32**	-0.00	-0.02
Q25_36	0.19	-0.01	**0.91**	0.01	0.02	0.03	0.02
Q25_37	0.00	0.14	**0.67**	-0.08	0.17	0.23	**0.37**
Q25_38	0.27	0.11	**0.42**	0.18	**0.54**	0.01	0.03
Q25_39	-0.11	-0.16	0.06	0.04	**0.46**	-0.11	**0.68**
Q25_40	0.00	**0.54**	-0.01	-0.27	**0.65**	**-0.41**	0.06
Q25_41	**0.48**	**-0.32**	0.00	**0.59**	-0.05	**0.35**	0.00
Q25_42	0.24	-0.12	-0.03	0.29	0.01	**-0.41**	**0.79**
Q25_43	-0.16	**0.43**	0.16	0.09	0.19	-0.07	**-0.33**
Q25_44	-0.00	**0.45**	**0.47**	0.02	**0.59**	**-0.37**	**0.61**
Q25_45	-0.25	**0.47**	-0.04	-0.05	**0.75**	0.08	-0.18
Q25_46	-0.02	-0.06	**0.41**	0.04	**0.58**	0.06	**0.42**
Q25_47	**0.31**	0.22	-0.00	0.14	0.25	-0.07	**0.54**
Q25_48	0.14	0.19	0.21	-0.27	**0.88**	0.04	-0.10
Q25_49	0.18	**-0.54**	0.18	0.25	**0.49**	0.18	-0.01
Q25_50	0.20	0.10	0.18	**0.52**	0.02	0.00	**0.65**
Q25_51	**0.49**	0.23	**0.63**	-0.01	-0.00	0.14	-0.01
Q25_52	0.02	0.28	-0.01	-0.23	-0.13	-0.22	**1.05**
Q25_53	0.08	**-0.34**	0.10	0.02	**0.51**	**0.65**	0.00

	Factor Loadings						
Item	1	2	3	4	5	6	7
Q25_54	-0.29	0.06	0.15	-0.02	0.20	**0.32**	**0.70**
Q25_55	-0.02	**0.49**	0.20	**-0.35**	**0.35**	0.01	**0.92**
Q25_56	0.02	**0.52**	0.12	-0.07	-0.00	0.15	**0.97**
Q25_57	0.01	-0.10	0.23	**-0.46**	-0.01	**0.78**	0.06
Q25_58	0.15	0.01	-0.02	**-0.47**	**0.35**	0.25	**0.34**
Q25_59	0.04	-0.06	**-0.41**	-0.17	0.14	0.01	**0.93**
Q25_60	0.00	**-0.49**	-0.01	**-0.44**	**0.61**	**0.53**	0.01
Q25_61	-0.05	-0.03	-0.04	**-0.48**	**0.59**	0.11	**0.60**
Q25_62	0.13	0.02	**-0.38**	0.00	**0.33**	0.22	**0.69**
Q25_63	-0.26	**0.42**	0.01	-0.01	**0.30**	**0.62**	**0.32**
Q25_64	0.03	-0.13	**0.30**	**-0.83**	0.12	0.25	-0.00
Q25_65	-0.00	0.26	0.03	0.02	-0.23	**0.81**	0.30

Exploratory factor analyses (EFA) were conducted separately on the **goal** and **event** samples using the WLSMV estimator and geomin oblique rotation. For both samples, models with **5 to 7 factors** were compared.

In both samples, the **7-factor model provided the best fit**: - **Goal sample (N = 35)**: $^2(1646) = 1710.24$, p = .132, CFI = .959, RMSEA = .034, accounting for **74.5% of the variance**. - **Event sample (N = 27)**: $^2(1646) = 1647.53$, p = .485, CFI = .999, RMSEA = .006, accounting for **84.1% of the variance**.

Notably, the **event sample demonstrated superior model fit and a higher proportion of explained variance**, suggesting a more cohesive and structured factor solution in this condition.

Both samples showed **strong primary loadings (> .60) on several factors**, with items such as **Q25_35 and Q25_36** loading robustly in both samples (>.90). However, both samples also exhibited **complex loading patterns**, with cross-loadings and occasional negative loadings (e.g., Q25_3, Q25_11). These patterns were **more pronounced in the event sample**, where several items showed **extremely high or inflated communalities** (e.g., Q25_29, Q25_44), suggesting potential overfitting or redundancy.

In both samples, **inter-factor correlations were generally weak to moderate**, reflecting distinct latent dimensions: - **Goal sample**: Strongest correlation between **Factor 1 and**

Factor 2 (r = .378, p < .01), with most other correlations below **.20**. - **Event sample**: Strongest correlation between **Factor 4 and Factor 6 (r = .468, p < .01)**, with most other correlations negligible (e.g., Factor 1 and Factor 2, r = -.020).

This suggests that while both conditions exhibit multidimensional structures, the **event sample factors were more independent**, with fewer overlaps among latent dimensions.

Overall, both samples support a **7-factor structure**. The **event sample demonstrated a cleaner, higher variance-explaining structure with more distinct factors**, while the **goal sample showed slightly more inter-factor correlation and cross-loadings**, suggesting greater overlap among constructs. These differences may reflect contextual differences in how the constructs are organized or interpreted across conditions.