We could have also done a confirmatory factor analysis. I use the ASTI data

It has a few sub dimensions identified from research. Items were created according to each dimension and then administered to sample. We want to see if items load on these dimensions

The ASTI (Levenson et al., 2005) is a self-report scale measuring the complex target construct of wisdom. The items can be assigned to five dimensions: self-knowledge and integration (SI), peace of mind (PM), non-attachment (NA), self-transcendence (ST), and presence in the here-and-now and growth (PG).

Usage

```
data("ASTI")
```

Format

A data frame with 1215 individuals, 25 ASTI items (3 or 4 categories per items), and 2 covariates (gender, group). Item wordings:

ASTI1

   I often engage in quiet contemplation. (PM; reversed)

ASTI2

   I feel that my individual life is a part of a greater whole. (ST)

ASTI3

   I don't worry about other people's opinions of me. (NA)

ASTI4

Item 18 has very less loading on pg dimension

```
> round(astisum$rotF["ASTI18",], 4)
          si      1,5,9,22na 2,4,7,13,16,24,25pg    si*pm*na*st*pg
      0.0000          0.0000               0.0367            0.0000
> |
```

The global fit indices and model test suggest a poor model fit. M2 p-value is significant

```
          0.0000            0.0000            0.0367            0.0000
> M2(asti5d, QMC = TRUE)
          M2  df p    RMSEA    RMSEA_5  RMSEA_95    SRMSR       TLI       CFI
stats 3062.338 252 0 0.0994316 0.09625165 0.1025554 0.1279998 0.3219027 0.3502642
> |
```

A good strategy, before even considering fitting a confirmatory MIRT model, is to compute unidimensional models for each subscale individually and eliminate misfitting items already at that level. The items kept in the model can be subsequently subject to a higher-dimensional IRT fit.

```
> coef(asti5d)
$ASTI1
    a1 a2 a3 a4   d1      d2
par  0  0  0  0 0.98 -1.363

$ASTI2
    a1 a2 a3 a4    d1     d2      d3
par  0  0  0  0 2.039 0.456 -1.441

$ASTI3
    a1   a2 a3 a4    d1      d2      d3
par  0 0.76  0  0 1.916 -0.115 -2.148

$ASTI4
    a1 a2 a3 a4    d1     d2      d3
par  0  0  0  0 2.376 0.546 -1.554

$ASTI5
    a1 a2 a3 a4    d1     d2      d3
par  0  0  0  0 2.278 0.222 -1.876

$ASTI6
    a1    a2 a3 a4    d1      d2     d3
par  0 0.969  0  0 1.942 -0.232 -2.28

$ASTI7
    a1 a2 a3 a4   d1      d2      d3
par  0  0  0  0 1.53 -0.002 -1.758
```