

# Latent Measurement Model

Standalone verified Python analysis

Test: Latent Measurement Model

Design: Reliability and validity of two prespecified CFA constructs before structural paths.

Variables: G1, G2, G3, famrel, freetime, goout

Null hypothesis: The measurement model has no reliable loadings or adequate covariance fit.

Formula:  $x = \Lambda \xi + \delta$ ;  $y = \Lambda \eta + \epsilon$ ;  $\Sigma = \Lambda \Phi \Lambda' + \Theta$ .

Source rows: 649

Calculated metrics:

cfi: 0.9973982062491278

rmsea: 0.03334482463134081

srmr: 0.03566318315739957

minimum\_cr: 0.46472892919002623

minimum\_ave: 0.26809760378634656

factor\_correlation: -0.14469453186032052

Independent reference values:

cfi: 0.9973982062491278

rmsea: 0.03334482463134081

srmr: 0.03566318315739957

minimum\_cr: 0.46472892919002623

minimum\_ave: 0.26809760378634656

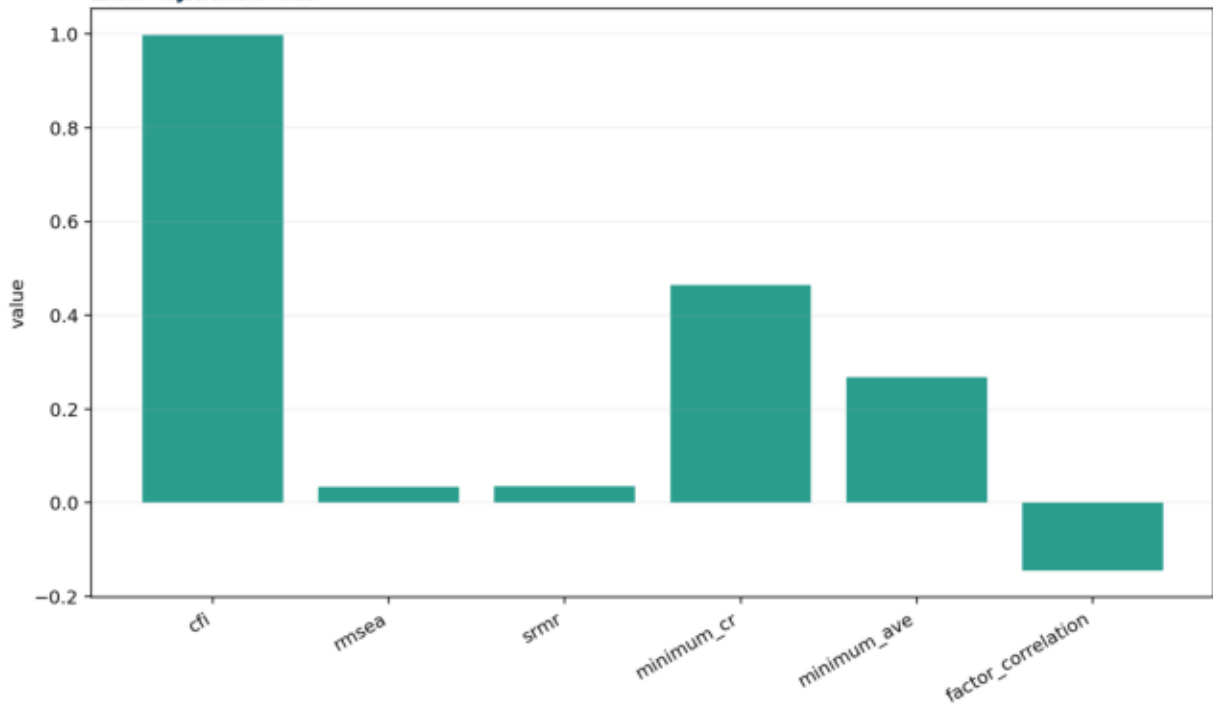
factor\_correlation: -0.14469453186032052

Interpretation:

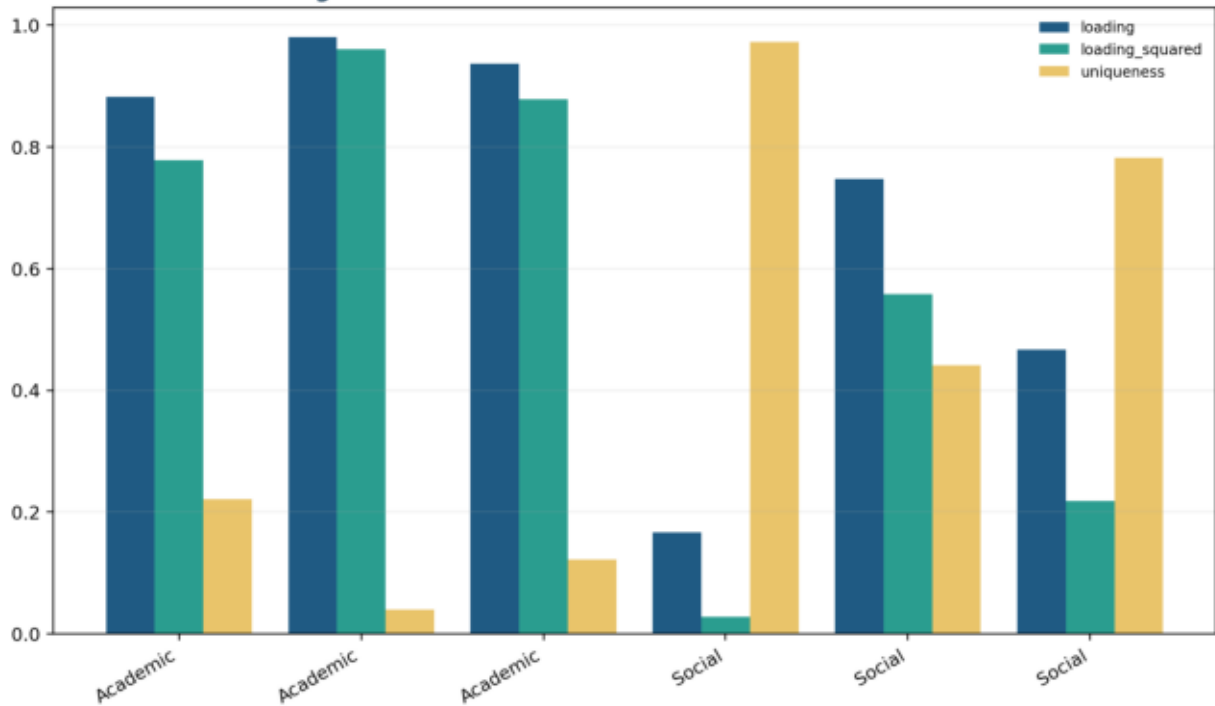
The latent measurement model is assessed before any structural path is interpreted.

Minimum CR=0.464729; minimum AVE=0.268098.

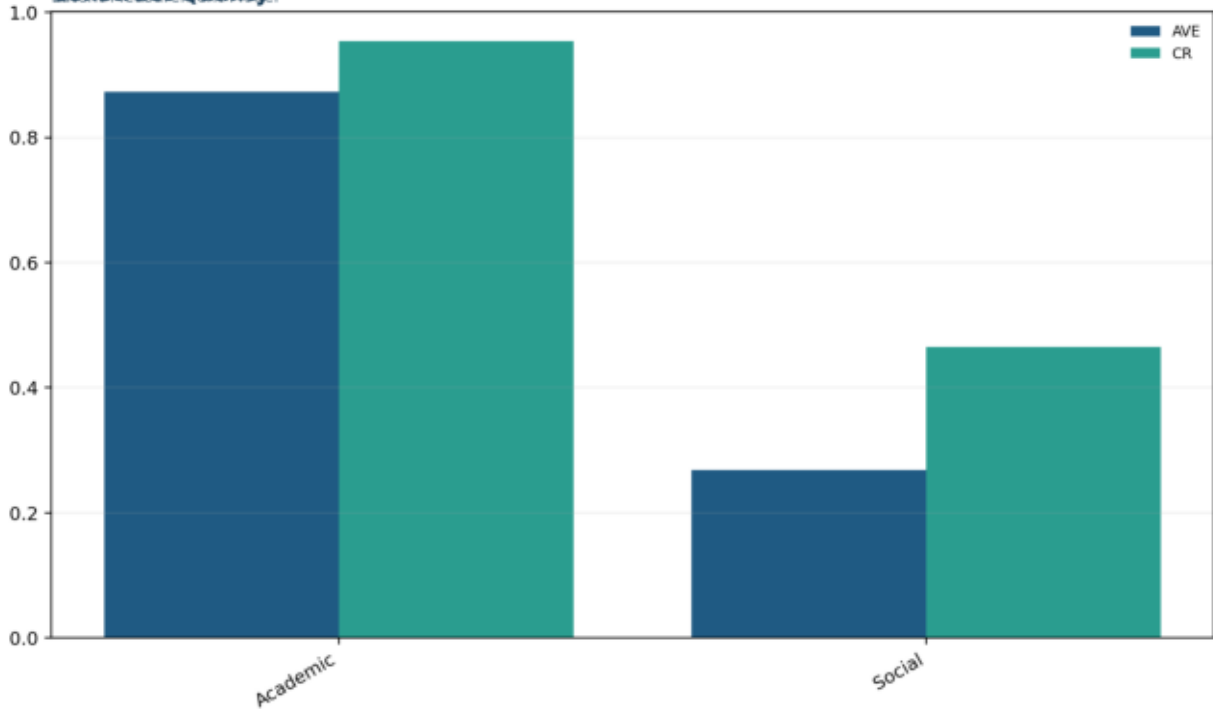
Primary Metrics



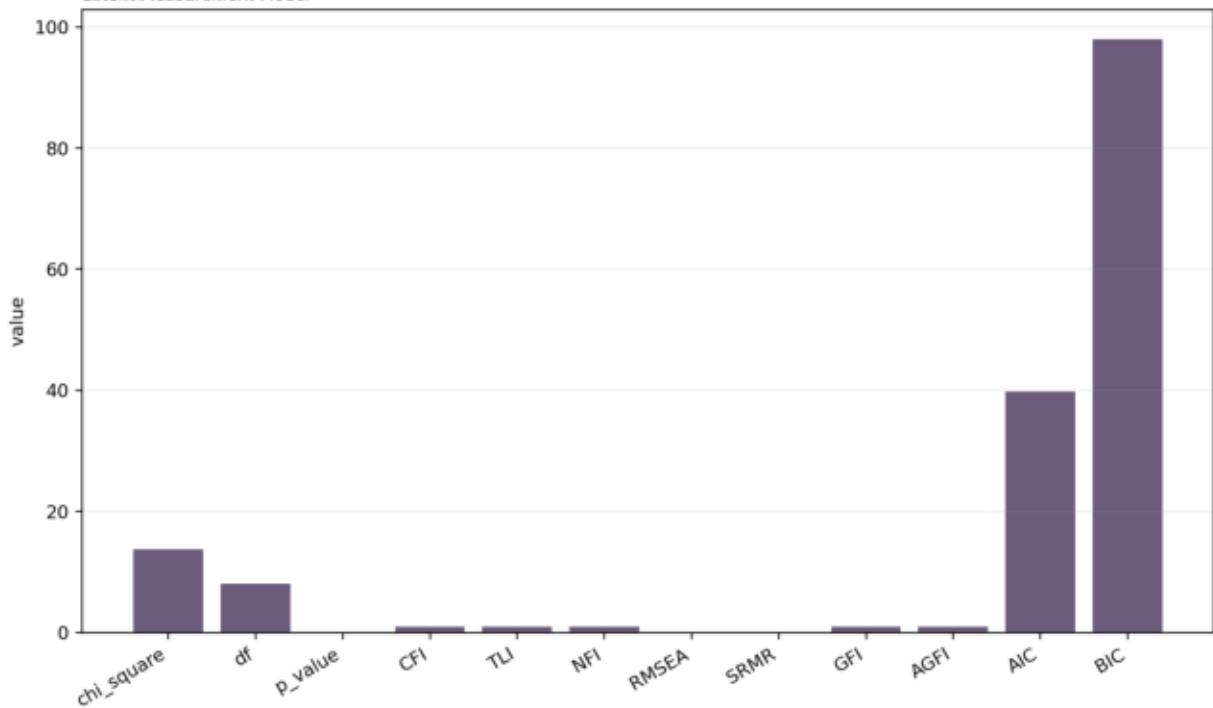
Measurement Loadings



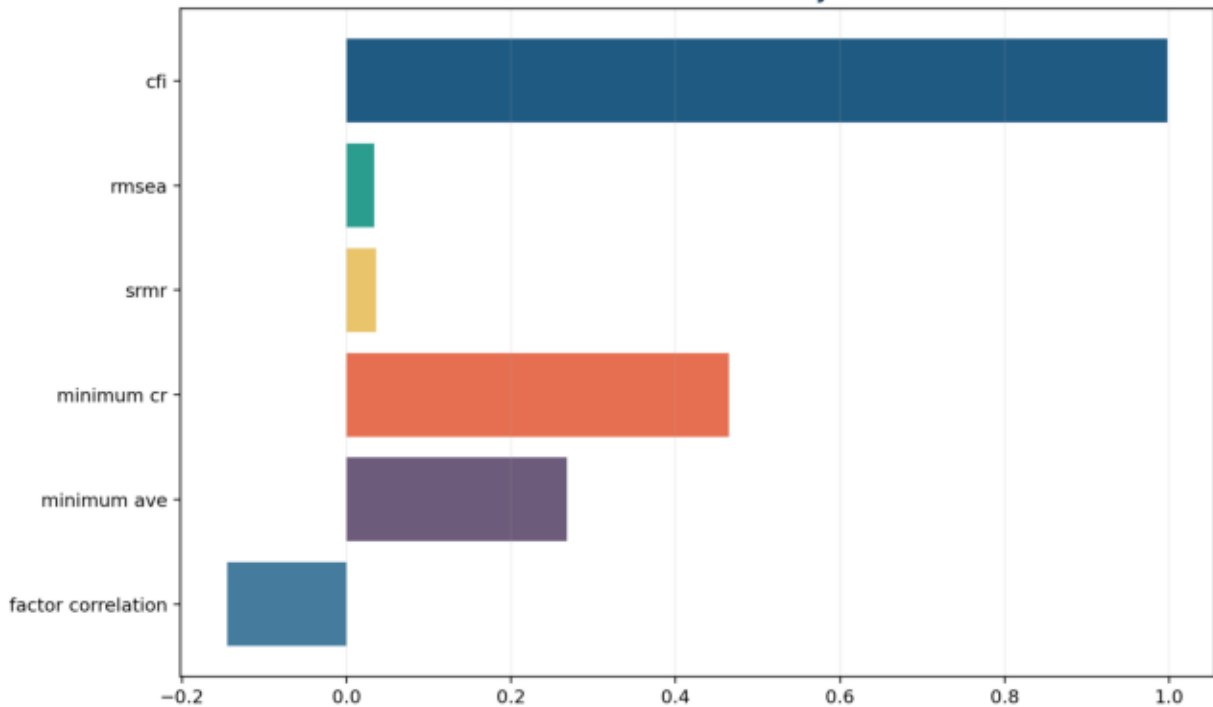
Construct Quality



Measurement Fit<sub>el</sub>



**Latent Measurement Model verified result summary**



# Primary Metrics

| metric             | value     |
|--------------------|-----------|
| cfi                | 0.997398  |
| rmsea              | 0.0333448 |
| srmr               | 0.0356632 |
| minimum_cr         | 0.464729  |
| minimum_ave        | 0.268098  |
| factor_correlation | -0.144695 |

# Measurement Loadings

| construct | item     | loading  | loading_squared | uniqueness |
|-----------|----------|----------|-----------------|------------|
| Academic  | G1       | 0.882325 | 0.778498        | 0.221502   |
| Academic  | G2       | 0.980163 | 0.96072         | 0.0392796  |
| Academic  | G3       | 0.937143 | 0.878238        | 0.121762   |
| Social    | famrel   | 0.16641  | 0.0276922       | 0.972308   |
| Social    | freetime | 0.747409 | 0.55862         | 0.44138    |
| Social    | goout    | 0.466884 | 0.217981        | 0.782019   |



# Construct Quality

| construct | AVE      | CR       |
|-----------|----------|----------|
| Academic  | 0.872485 | 0.953465 |
| Social    | 0.268098 | 0.464729 |

# Measurement Fit

| index      | value     |
|------------|-----------|
| chi_square | 13.764    |
| df         | 8         |
| p_value    | 0.0881286 |
| CFI        | 0.997398  |
| TLI        | 0.995122  |
| NFI        | 0.993829  |
| RMSEA      | 0.0333448 |
| SRMR       | 0.0356632 |
| GFI        | 0.992635  |
| AGFI       | 0.980667  |
| AIC        | 39.764    |
| BIC        | 97.9446   |