

Python Bootstrap Reliability Analysis

Standalone verified Python analysis

Test: Python Bootstrap Reliability Analysis

Design: Case-resampling uncertainty analysis for raw Cronbach alpha across G1, G2, and G3.

Variables: G1, G2, G3

Null hypothesis: The three-grade raw alpha is zero; bootstrap sampling quantifies its uncertainty.

Formula: alpha is recomputed in 2,000 case bootstrap samples; CI is the percentile 2.5% to 97.5% interval.

Source rows: 649

Calculated metrics:

cronbach_alpha: 0.9506074615951181

bootstrap_ci_low: 0.9409284586229588

bootstrap_ci_high: 0.9597803323558453

bootstrap_replications: 2000

items: 3

n_cases: 649

Independent reference values:

cronbach_alpha: 0.9506074615951181

bootstrap_ci_low: 0.9409284586229588

bootstrap_ci_high: 0.9597803323558453

bootstrap_replications: 2000

items: 3

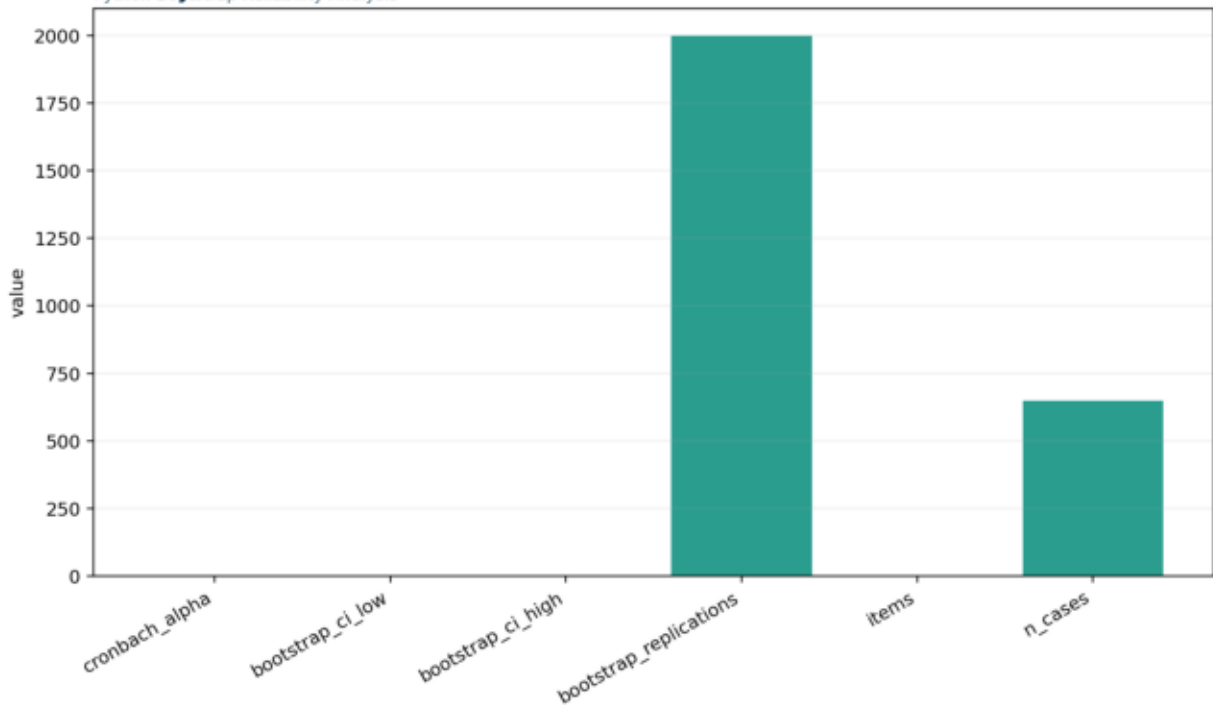
n_cases: 649

Interpretation:

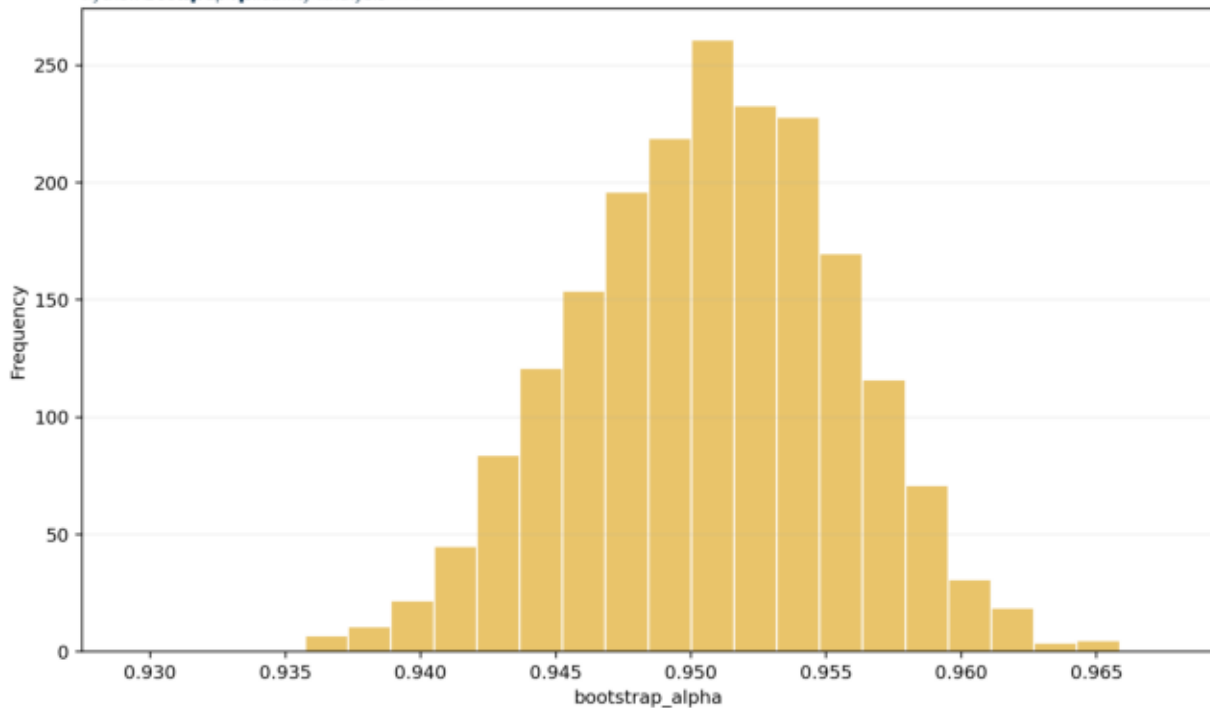
Cases are resampled and alpha is recomputed 2,000 times.

Bootstrap 95% interval [0.940928, 0.959780].

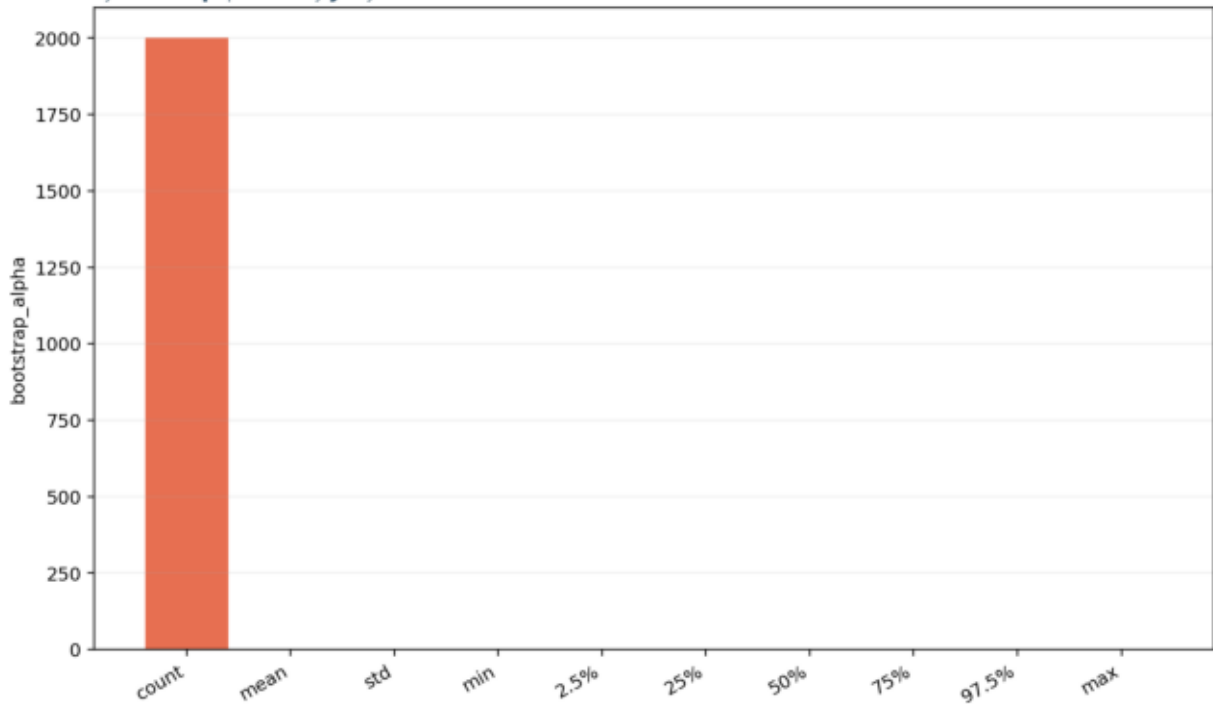
Primary Metrics



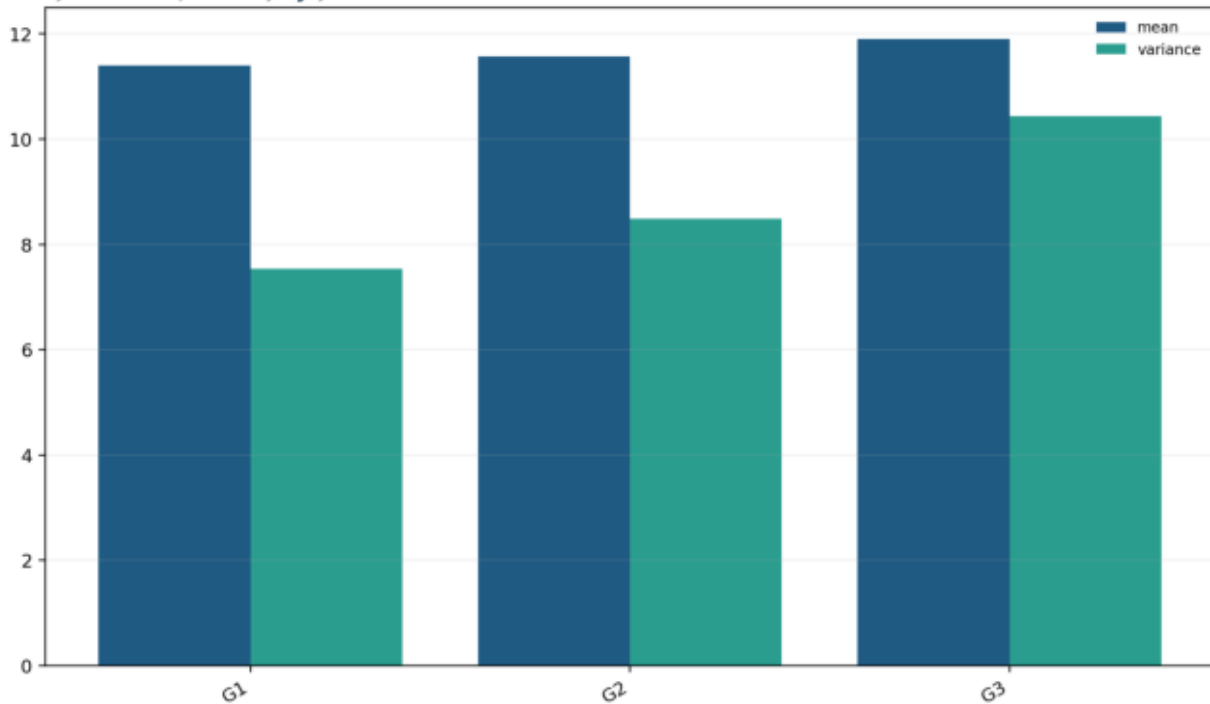
Bootstrap Alpha Distribution



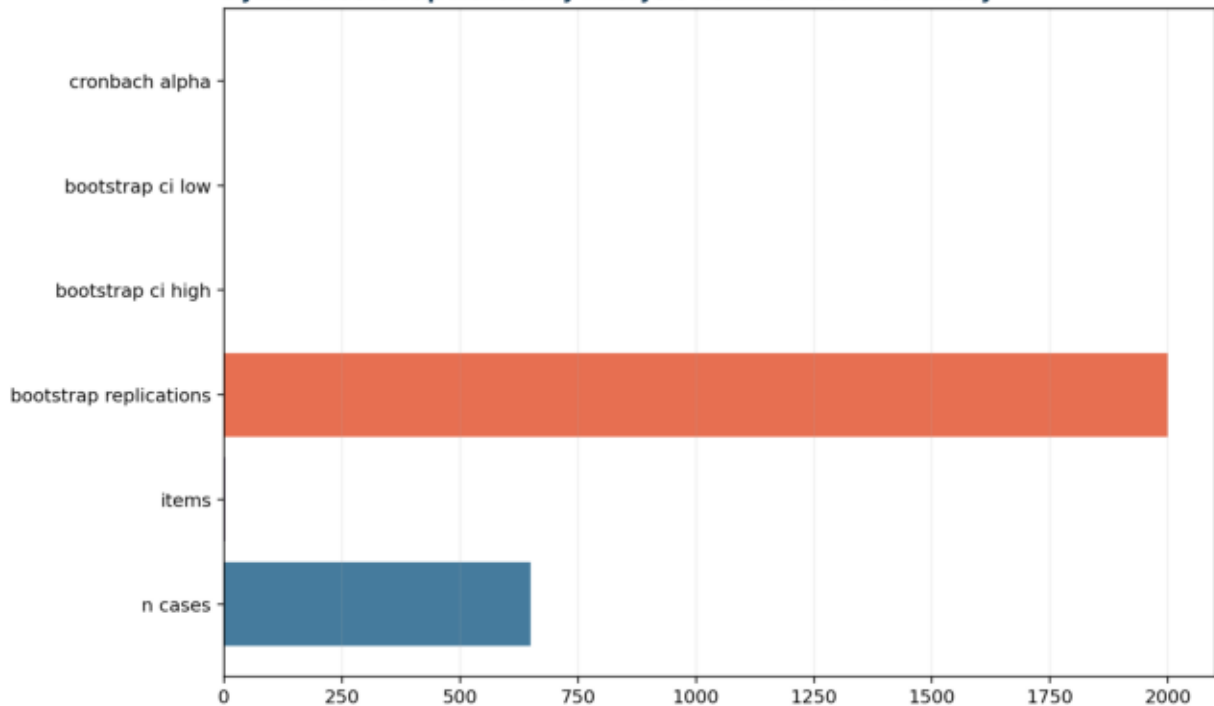
Bootstrap Summary



Grade Item Summary Analysis



Python Bootstrap Reliability Analysis verified result summary



Primary Metrics

metric	value
cronbach_alpha	0.950607
bootstrap_ci_low	0.940928
bootstrap_ci_high	0.95978
bootstrap_replications	2000
items	3
n_cases	649

Bootstrap Alpha Distribution

bootstrap_alpha
0.953657
0.946592
0.954673
0.954063
0.946948
0.937536
0.957508
0.95526
0.952838
0.944848
0.945739
0.943271
0.949302
0.947908
0.954644
0.953288
0.957314
0.941208
0.949119
0.947699
0.955547
0.957492
0.938082
0.957765
0.961083
0.953052

Bootstrap Summary

index	bootstrap_alpha
count	2000
mean	0.950666
std	0.00497684
min	0.929378
2.5%	0.940928
25%	0.947269
50%	0.950868
75%	0.95413
97.5%	0.95978
max	0.967438

Grade Item Summary

grade	mean	variance
G1	11.3991	7.53648
G2	11.5701	8.48929
G3	11.906	10.4371