

Spearman-Brown Prophecy Formula

Standalone verified Python analysis

Test: Spearman-Brown Prophecy Formula

Design: Reliability predicted after changing test length from the observed G1-G2 correlation.

Variables: G1, G2, length multiplier

Null hypothesis: Changing test length does not alter predicted reliability beyond the observed parallel-form correlation.

Formula: $\rho_{new} = m \rho_{old} / [1 + (m-1)\rho_{old}]$.

Source rows: 649

Calculated metrics:

observed_reliability: 0.8649816303085818

predicted_reliability_double_length: 0.9276033782332334

required_multiplier_for_0_90: 1.4048452413830508

target_reliability: 0.9

n_pairs: 649

Independent reference values:

observed_reliability: 0.8649816303085818

predicted_reliability_double_length: 0.9276033782332334

required_multiplier_for_0_90: 1.4048452413830508

target_reliability: 0.9

n_pairs: 649

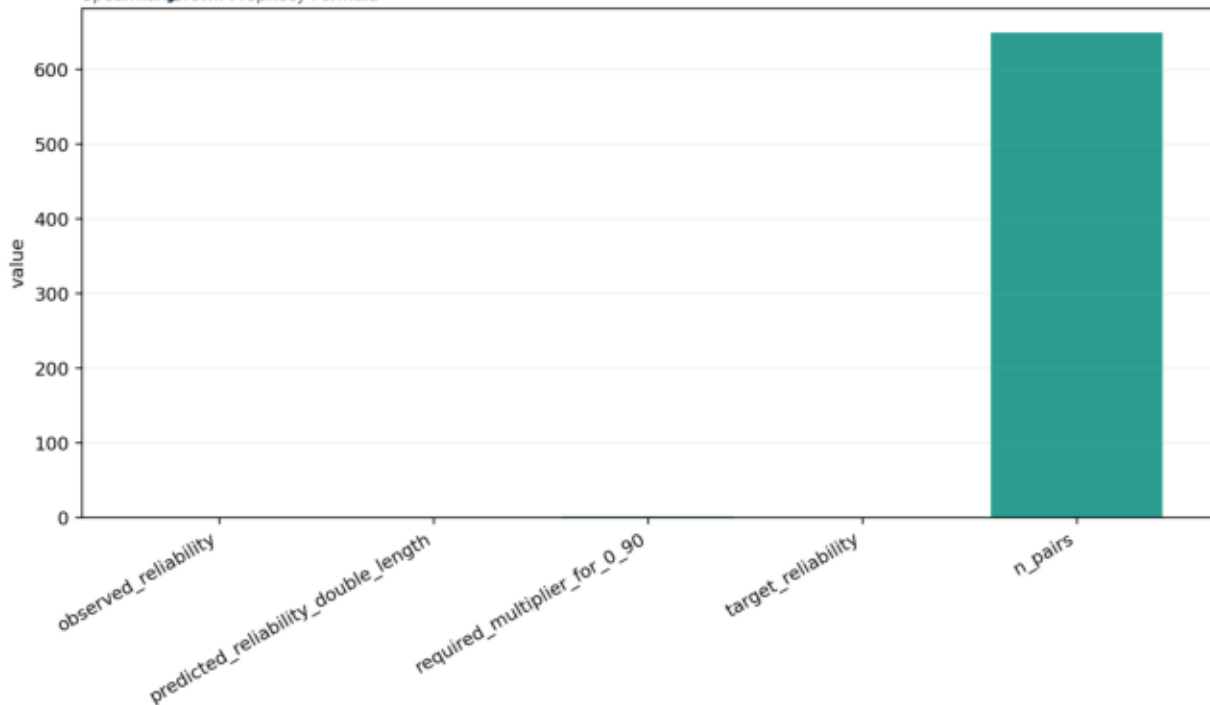
Interpretation:

The formula predicts reliability after changing length; it does not create a new empirical split.

Double-length predicted reliability=0.927603.

Primary Metrics

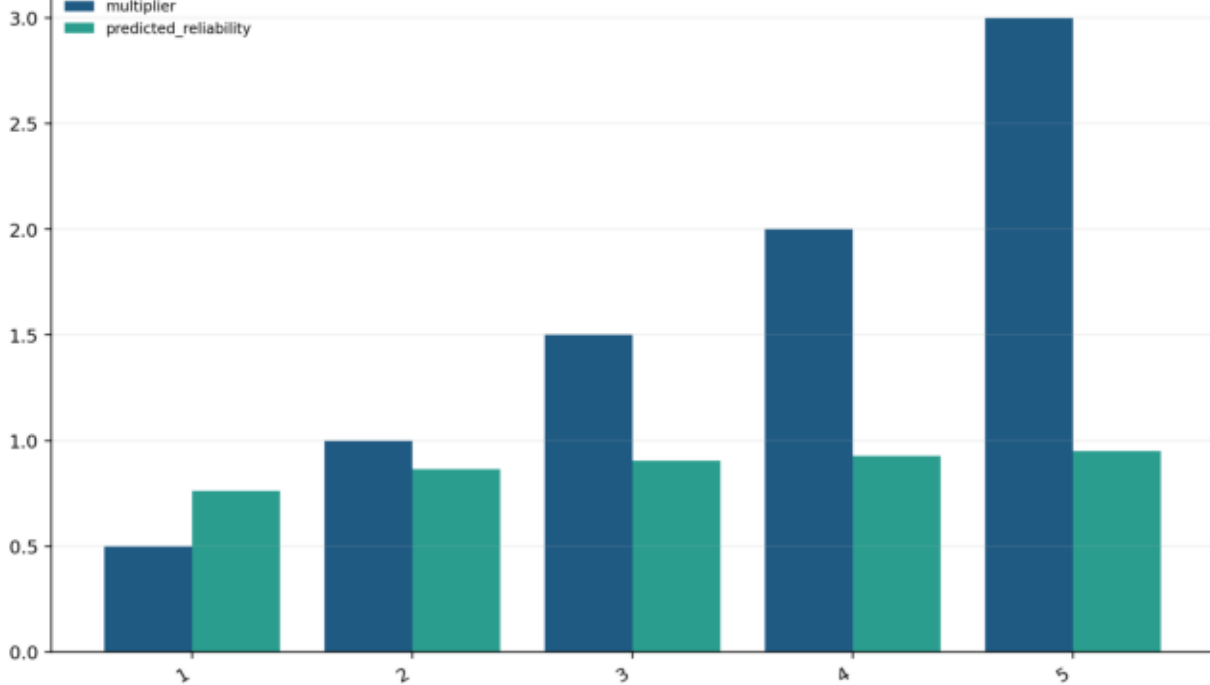
Primary Metric Formula



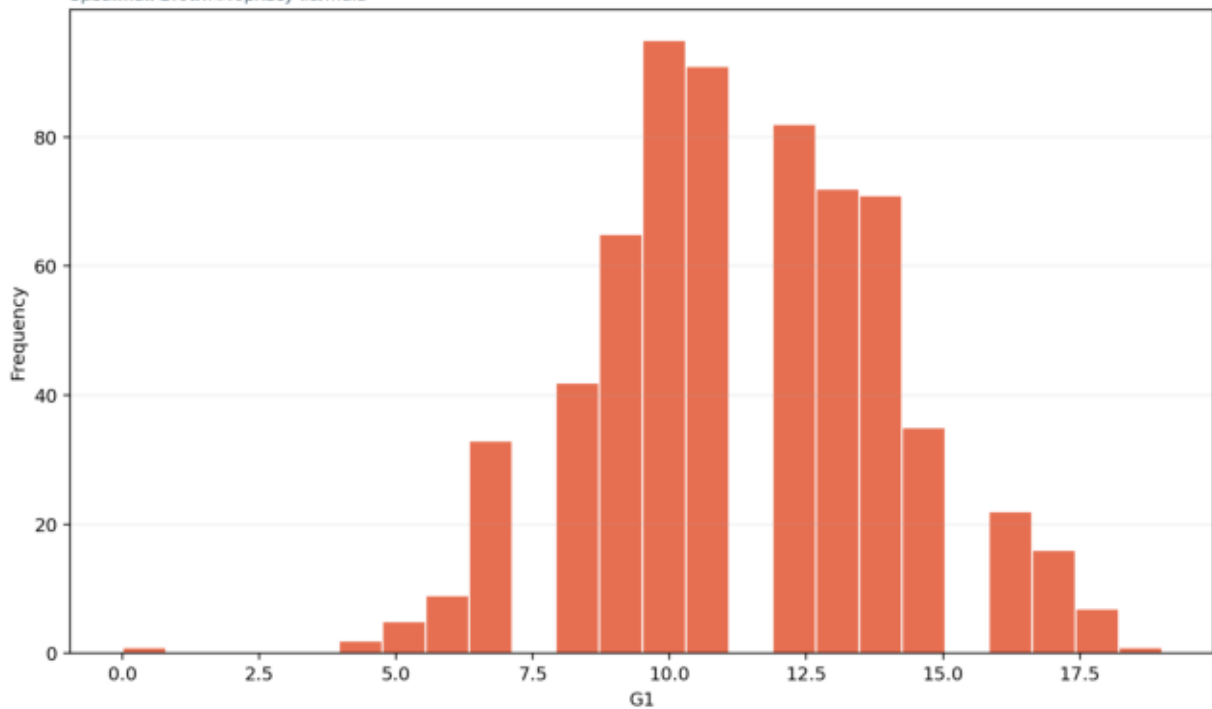
Prophecy Scenarios

prophecy_scenario, multiplier, predicted_reliability, formula

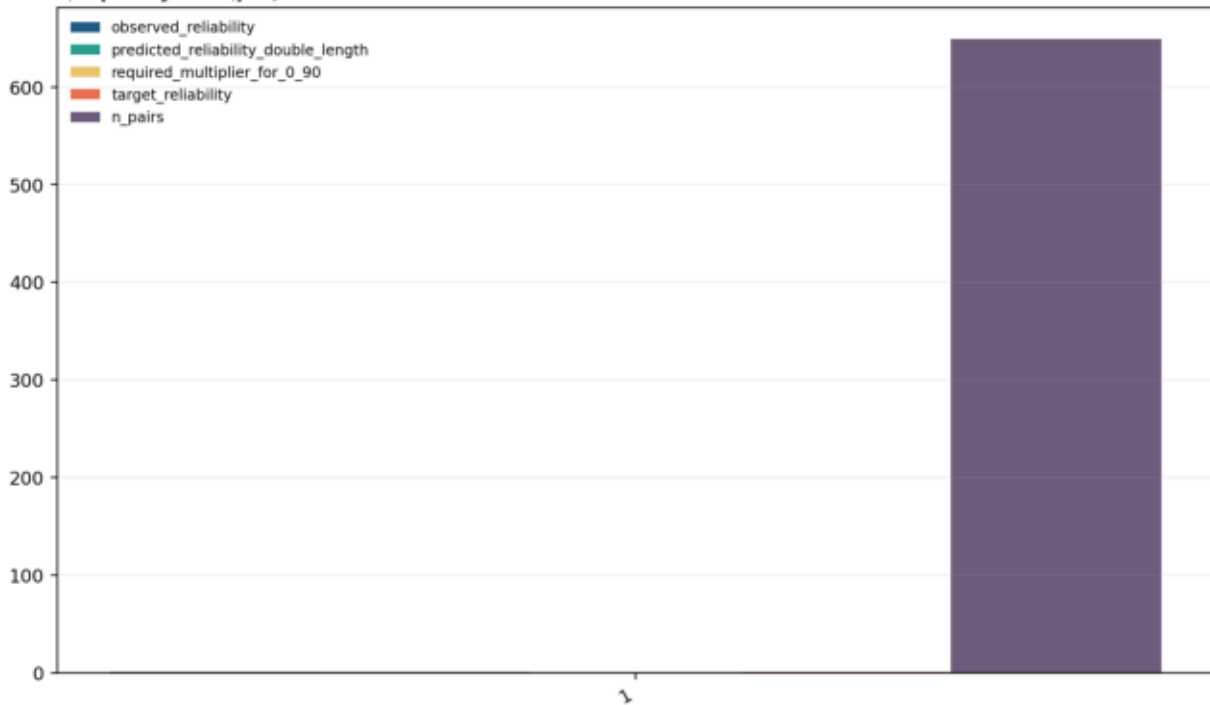
multiplier
predicted_reliability



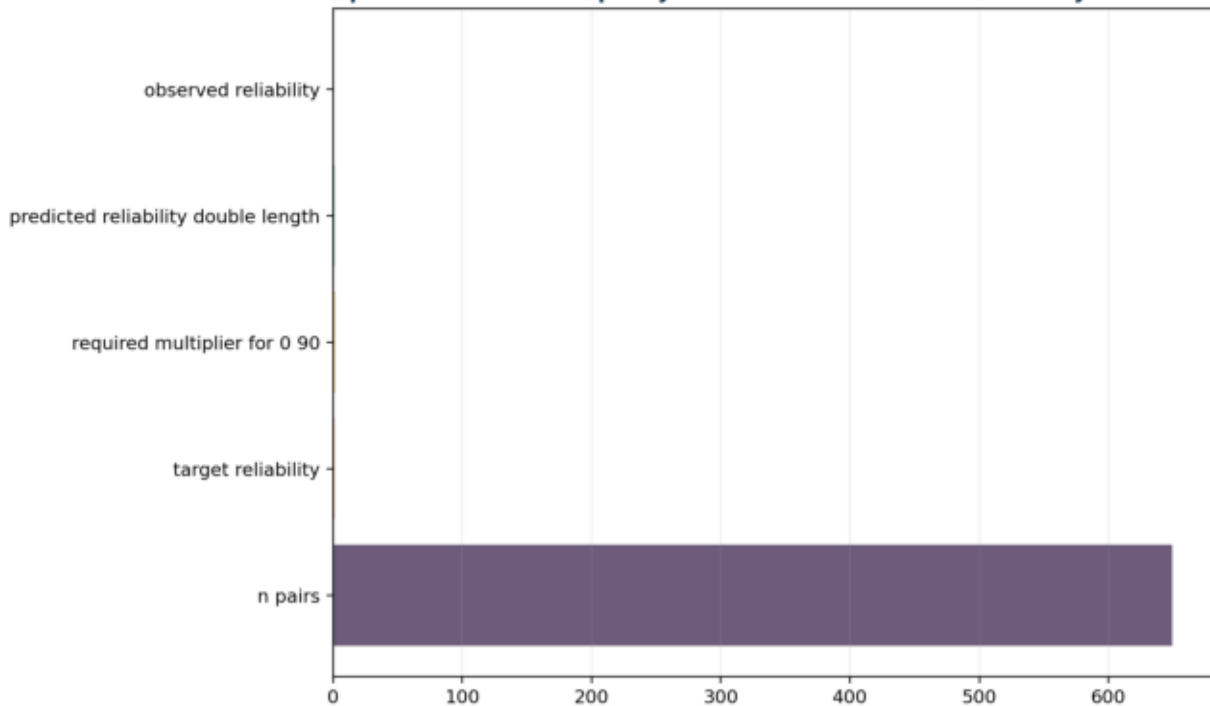
Parallel Form Scores



Prophecy Components



Spearman-Brown Prophecy Formula verified result summary



Primary Metrics

metric	value
observed_reliability	0.864982
predicted_reliability_double_length	0.927603
required_multiplier_for_0_90	1.40485
target_reliability	0.9
n_pairs	649

Prophecy Scenarios

multiplier	predicted_reliability
0.5	0.762086
1	0.864982
1.5	0.905746
2	0.927603
3	0.950542

Parallel Form Scores

G1	G2
0	11
9	11
12	13
14	14
11	13
12	12
13	12
10	13
15	16
12	12
14	14
10	12
12	13
12	12
14	14
17	17
13	13
13	14
8	8
12	12
12	13
11	12
12	13
10	10
10	11
10	11

Prophecy Components

observed_reliability	predicted_reliability_double_lambda	required_multiplier_for_0.9	target_reliability	n_pairs
0.864982	0.927603	1.40485	0.9	649