

Kuder-Richardson Formula 20

Standalone verified Python analysis

Test: Kuder-Richardson Formula 20

Design: Internal consistency of six unequal-difficulty binary support/intention items.

Variables: schoolsup, famsup, paid, activities, higher, internet

Null hypothesis: The binary composite has no internal-consistency reliability.

Formula: $KR-20 = k / (k-1) [1 - \sum p_i q_i / s_{total}^2]$.

Source rows: 649

Calculated metrics:

kr20: 0.21264912139527564

items: 6

n_cases: 649

total_score_variance: 1.1069451577926155

Independent reference values:

kr20: 0.21264912139527564

items: 6

n_cases: 649

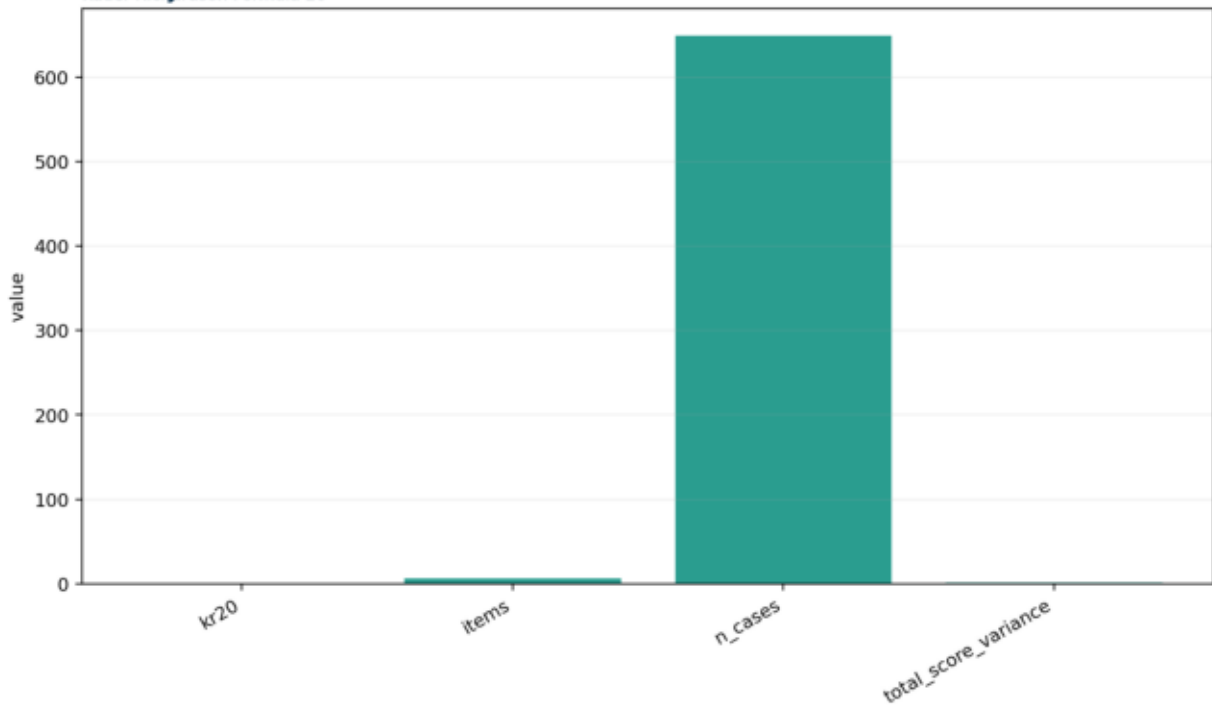
total_score_variance: 1.1069451577926155

Interpretation:

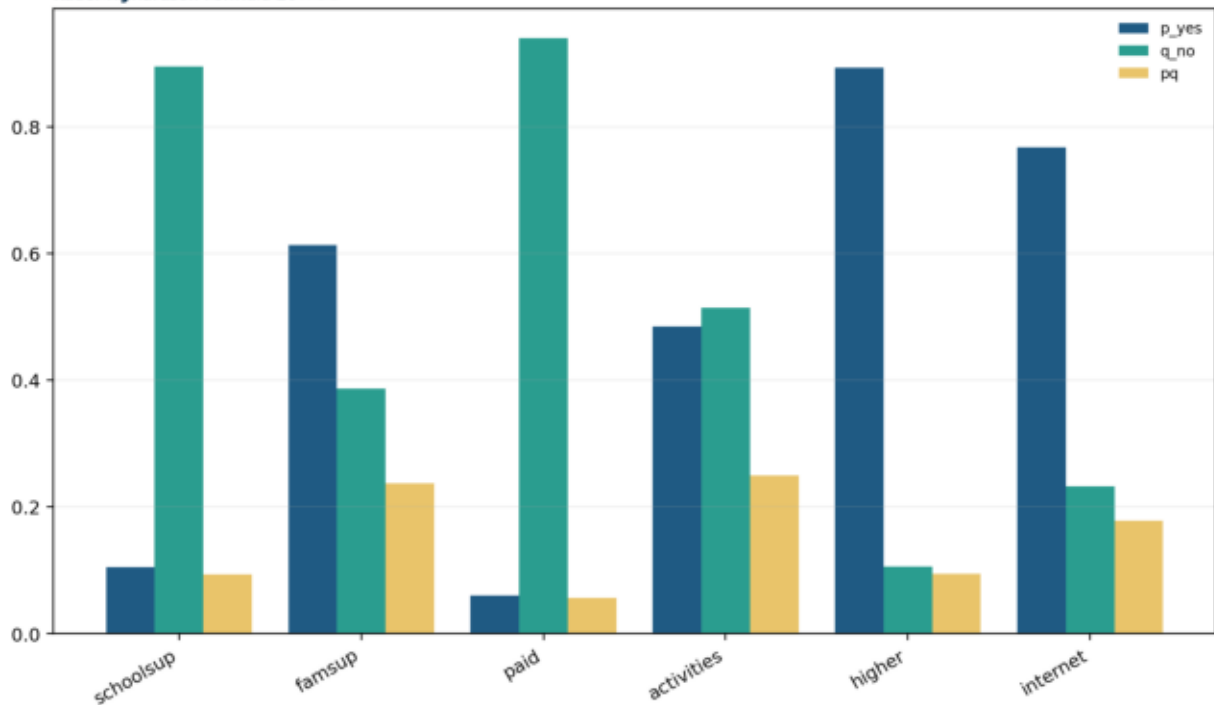
KR-20 retains each item's own p times q contribution.

KR-20=0.212649.

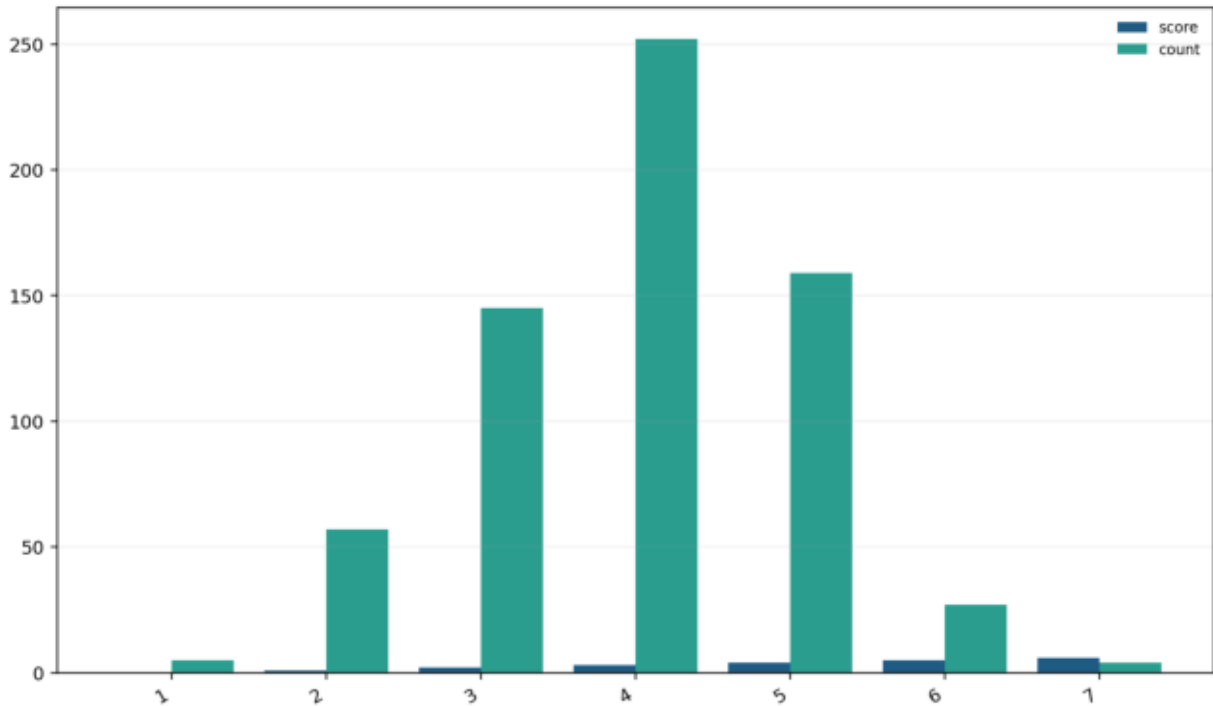
Primary Metrics



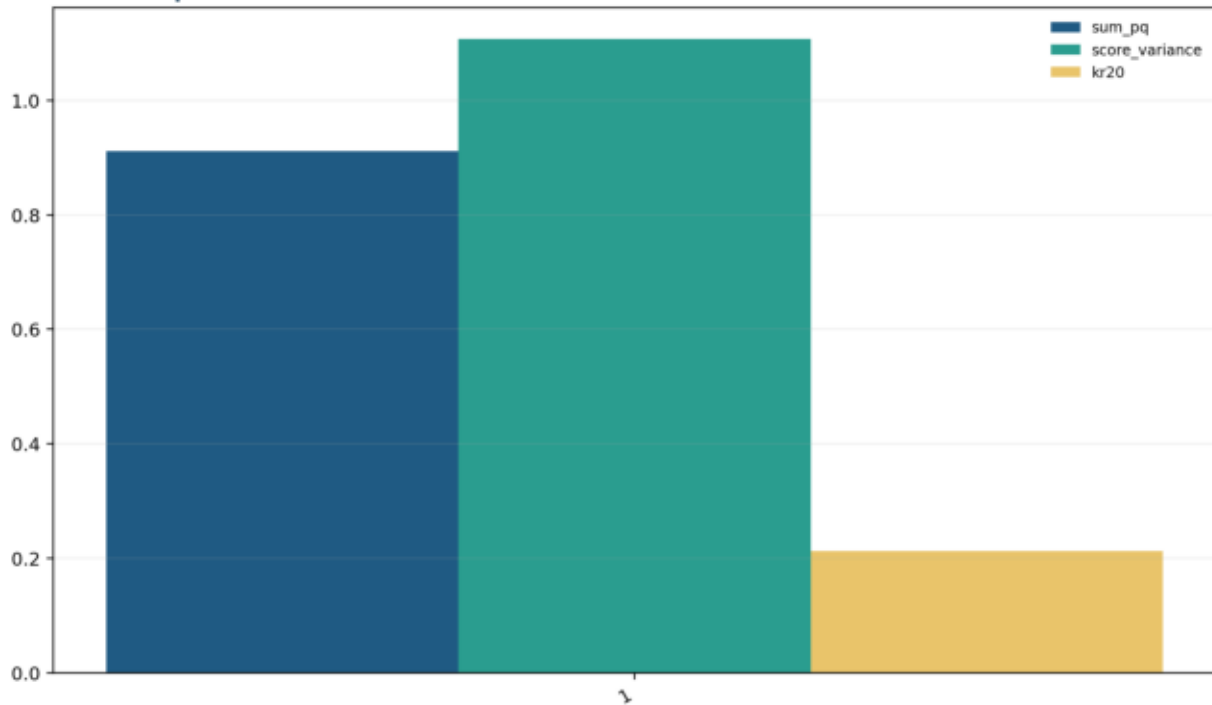
Binary Item Difficulties



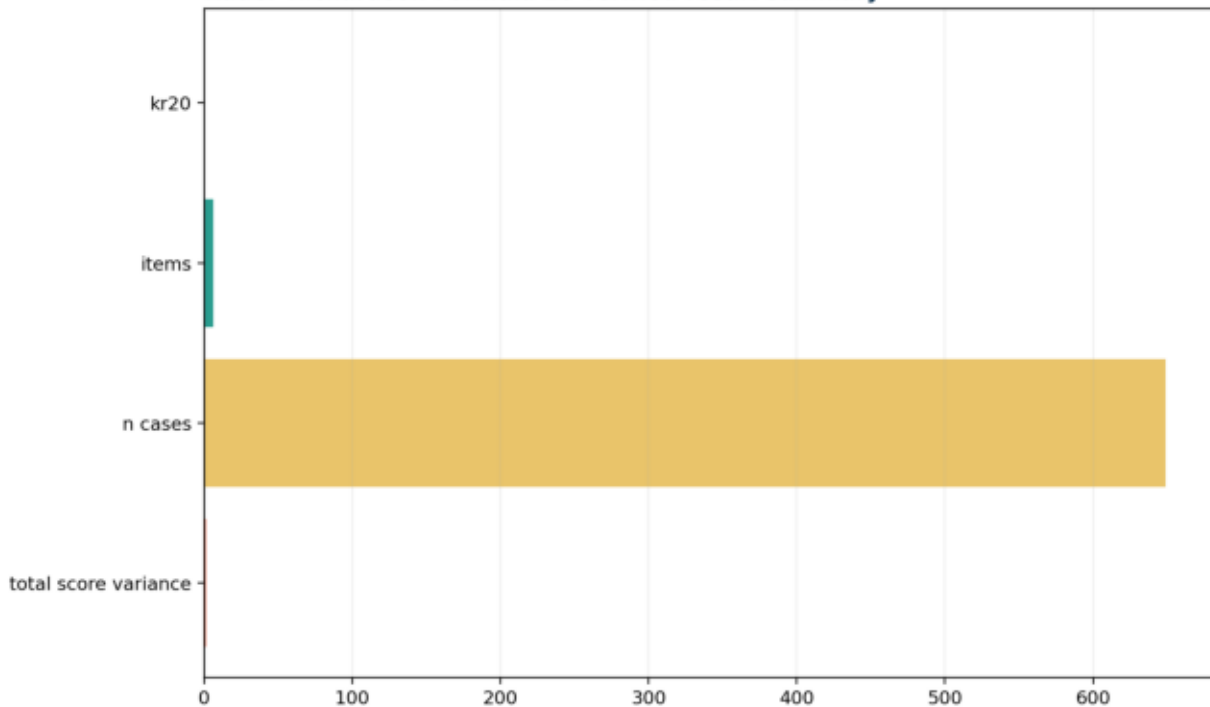
Total Score Distribution



Kr20 Components



Kuder-Richardson Formula 20 verified result summary



Primary Metrics

metric	value
kr20	0.212649
items	6
n_cases	649
total_score_variance	1.10695

Binary Item Difficulties

item	p_yes	q_no	pq
schoolsup	0.104777	0.895223	0.0937984
famsup	0.613251	0.386749	0.237174
paid	0.0600924	0.939908	0.0564813
activities	0.485362	0.514638	0.249786
higher	0.893683	0.106317	0.095014
internet	0.767334	0.232666	0.178532

Total Score Distribution

score	count
0	5
1	57
2	145
3	252
4	159
5	27
6	4

Kr20 Components

sum_pq	score_variance	kr20
0.910786	1.10695	0.212649