
How schooling is associated with cognitive functions of children in rural Burkina Faso: Preliminary results from the PROMISE Saving Brains Study ?

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Background



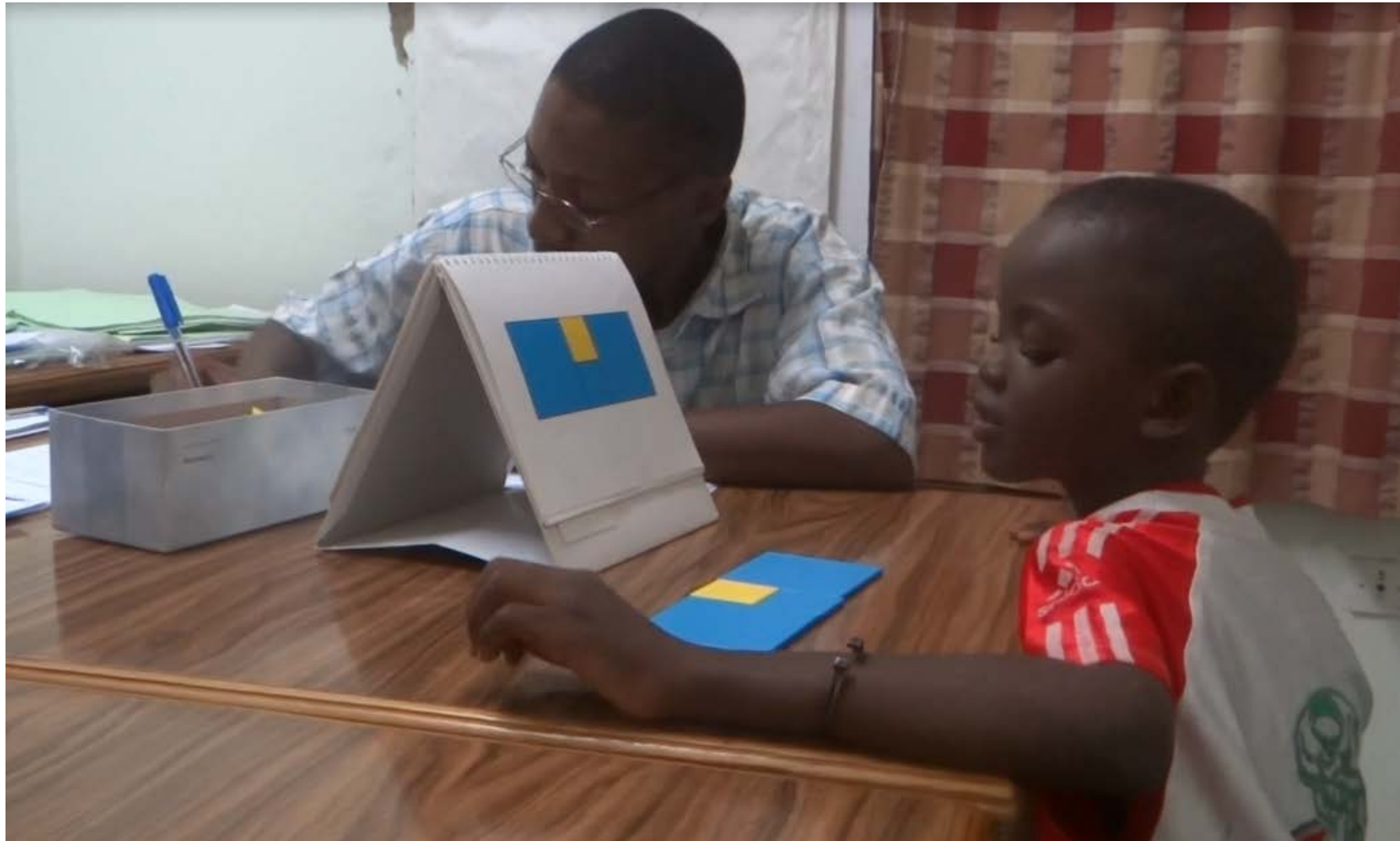
Background

- Kauffman Assessment Battery for Children, second edition (KABC-II) is a psychometric test to measure cognitive functions
- Fives scales: Learning, Sequential, Simultaneous, Planning and Knowledge
- **Simultaneous assesses visual memory, spatial relations, visualization, spatial scanning**

Background : Conceptual Thinking (Conceptual)



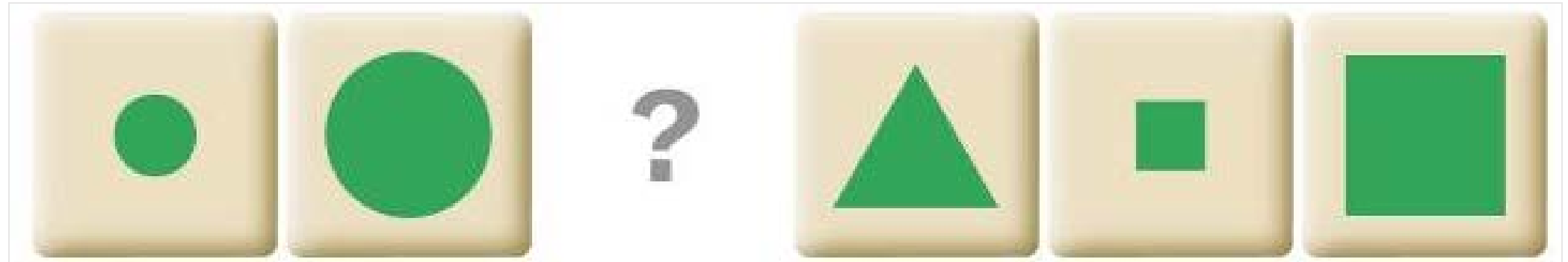
Background: Triangle



Background: Rover



Background: Pattern Reasoning (Pattern)



Background

- **PROMISE Saving Brains (SB)** has used for the first time the KABC-II to assess cognitive functions in rural Burkina Faso
- It is a follow up of the PROMISE EBF to assess exclusive breastfeeding promotion on human capital development (NCT01882335)
- PROMISE-EBF trial was a cluster-randomized trial conducted in rural Burkina Faso to assess the effect of exclusive breastfeeding counselling by peer counsellors.

Lancet 2011; 378: 420–27

Objectives

How useful are these tests in our context?

- We assessed the reliability and the validity of the subtests of Simultaneous
- and explored the association between schooling and the the Simultaneous cognitive function subtests

Results: Sample characteristics

Variables	N=556	(%)	Mean (SD)
Age	556		7.17 (0.35)
Male	302	54.32	
In School*	279	50.18	
Mothers' education (yes)	91	17.40	
WAZ z-score*	541		- 0.97 (0.84)
HAZ z-score*	540		-1.03 (1.01)

* Kids were at school for less than 1 to 12 months

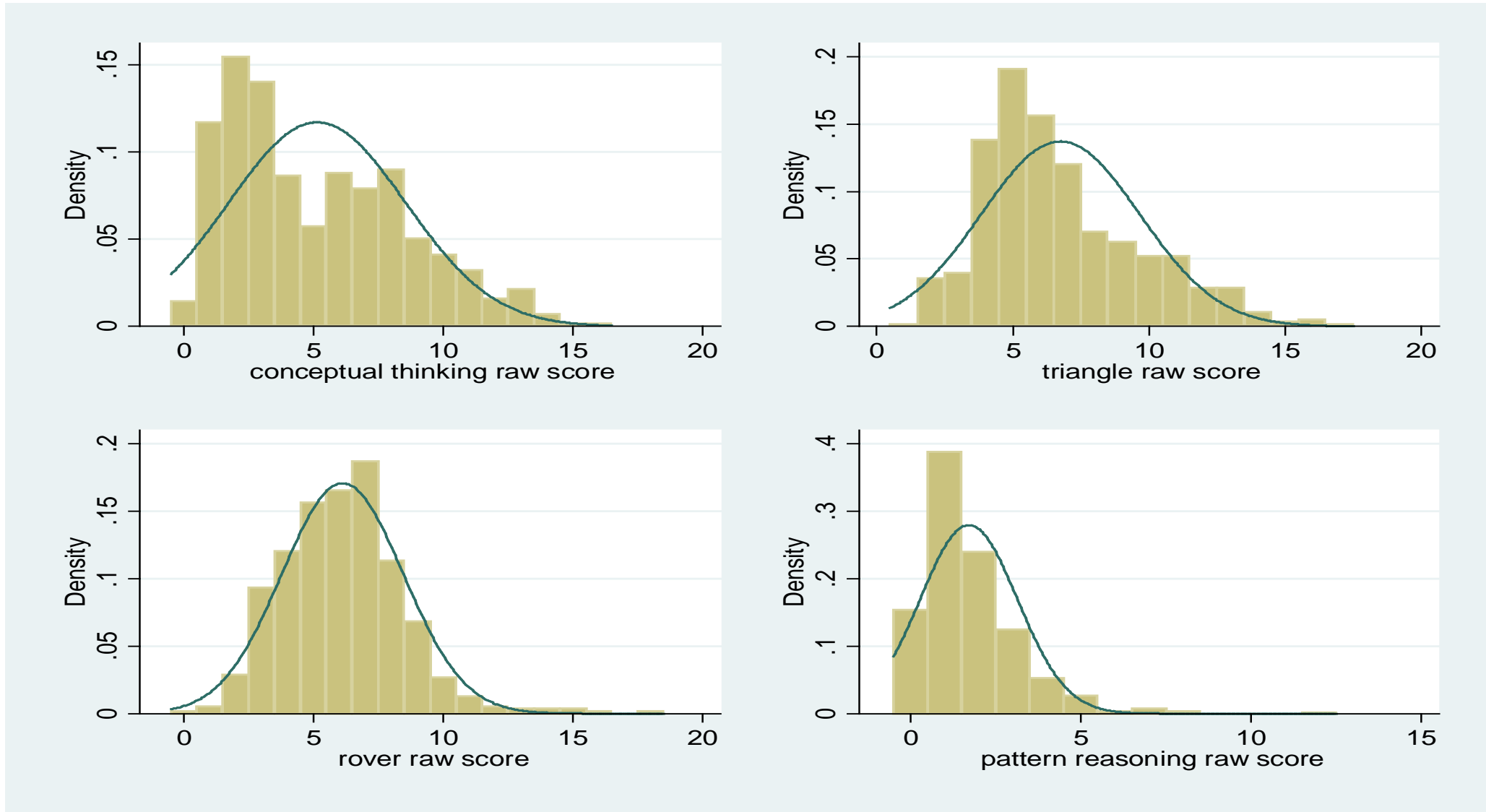
Results: Subtests description

Subtests	N	Maxi score possible	Mean (SD)	Range	% Score 0
Conceptual	555	28	5.14 (3.41)	0-16	1.44
Triangle	555	45	6.75 (2.91)	1-17	0.00
Rover	555	44	6.12 (2.34)	0-18	0.18
Pattern	554	63	1.71 (1.43)	0-12	15.32

Results: Subtests description

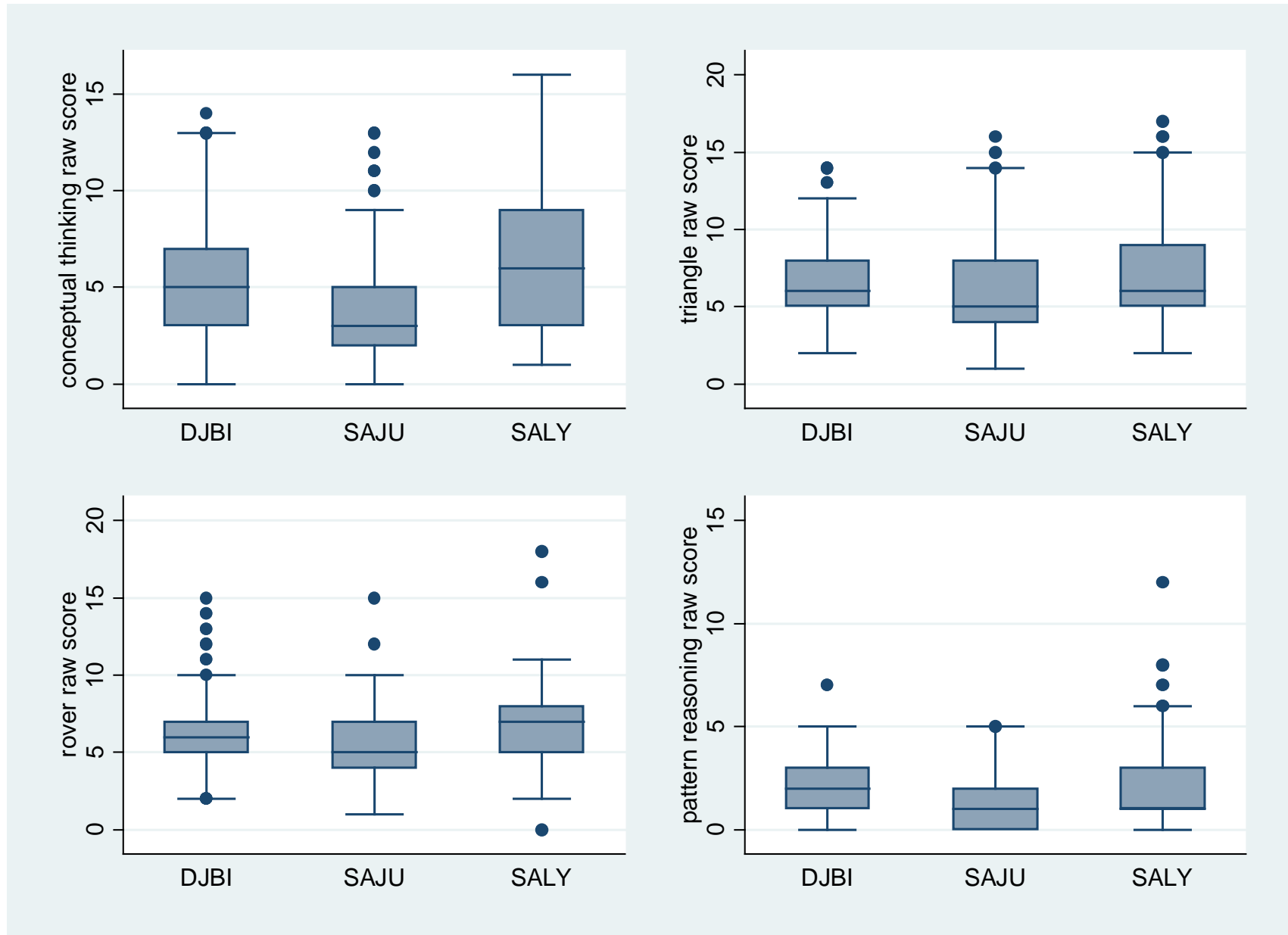
Subtests	Not schooling N =277		In schooling N=278	
	Mean (SD)	Range	Mean (SD)	Range
Conceptual	4.81 (3.30)	0-14	5.46 (3.50)	0-16
Triangle	5.72 (2.35)	2-13	7.75 (3.05)	1-17
Rover	5.72 (2.24)	0-18	6.50 (2.36)	1-16
Pattern	1.64 (1.29)	0-8	1.76 (1.55)	0-12

Results: Within population variance



Simultaneous/Gv subtests in 556 children PROMISE SB, Burkina Faso

Results: Inter-testers variability



random assignment

Results: Internal consistency

Subtests	Split-half	Items included	Total items
Conceptual	0.836 ^a	26	28
Triangle	0.857 ^a	17	27
Rover	0.283 ^b	10	22
Pattern	0.566 ^c	14	36

Cicchetti, 1994

a Excellent, b Poor, c Fair

Results: Correlation between Time 1 & 2

	All	No schooling	In school
Subtests	<i>r</i>	<i>r</i>	<i>r</i>
Conceptual	0.39	0.24	0.40
Triangle	0.67	0.58	0.72
Rover	0.50	-0.09	0.67
Pattern	0.09	-0.17	0.20

Results: Factor analysis

Winsorised Zscore	Factor 1	Factor 2
Atlantis	0.315	0.653
Face	0.155	0.474
Story	0.114	0.374
Number	0.363	0.589
Block	0.243	0.499
Word	0.992	0.492
Conceptual	0.201	0.507
Triangle	0.352	0.724
Rover	0.256	0.413
Pattern	0.023	0.271
Variance explained	18.28%	34.71%

Results: Factor analysis without Pattern Reasoning

Winsorised Zscore	Factor 1	
Triangle	0.730	
Atlantis	0.659	
Number	0.615	
Word	0.589	
Block	0.506	General ability
Conceptual	0.495	
Face	0.457	
Rover	0.430	
Story	0.347	
Variance explained	30.07%	

Results: Association Conceptual and characteristics

Variables	Univariate	Multivariate
Coeff (SE)		
In School	0.65 (0.28)*	0.55 (0.29)
Age	0.43 (0.40)	
Female	-0.35 (0.29)	
Mothers' edu	0.58 (0.37)	
WAZ z-score	0.22 (0.17)	
HAZ z-score	0.41 (0.14)**	0.38 (0.14)**

Results: Association Triangle and characteristics

Variables	Univariate	Multivariate
Coeff (SE)		
In School	2.03 (0.23)***	1.83 (0.24)***
Age	0.89 (0.34)**	0.84 (0.33)*
Female	-0.69 (0.24)**	-0.76 (0.23)**
Mothers' edu	1.46 (0.31)***	1.01 (0.29)**
WAZ z-score	0.43 (0.15)***	-0.19 (0.21)
HAZ z-score	0.54 (0.12)***	0.61 (0.18)**

Results: Association Rover and characteristics

Variables		Univariate	Multivariate
	Coeff (SE)		
In School		0.77 (0.19)***	0.70 (0.19)***
Age		0.31 (0.28)	
Gender (Female)		-0.44 (0.19)*	-0.42 (0.19)*
Mothers' edu		0.33 (0.26)	
WAZ z-score		0.36 (0.11)***	0.17 (0.18)
HAZ z-score		0.28 (0.09)***	0.17 (0.015)

Discussion/Conclusion

1. Very little variability for Pattern Reasoning
2. Factor analysis without Pattern Reasoning showed one factor (General Ability)
3. Conceptual Thinking and Triangle showed good internal consistency
4. Results confirm observations of performance

Discussion/Conclusion

1. Preliminary analysis suggests that schooling is associated with Rover and Triangle
2. Children in school had a more consistent performance over time than those not in school
3. No association between Schooling and Conceptual Thinking
4. Schooling affects cognitive functions of children in rural Burkina Faso

Merci pour votre attention

Acknowledgement

