

# Psychometric Analysis of Mathematic Assessment Tests Used with French-speaker Children

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## TWO OBJECTIVES

- 1) Recension of French clinical tools for the assessment of mathematical abilities for children (Lafay, St-Pierre, & Macoir, 2014)
- 2) Analyze of these tools with regards to their psychometric properties

## METHODS

### 1) Recension

- Research on data bases and websites of editors (eg. Pearson) to complete the publication of Lafay, St-Pierre, & Macoir (2014)
- Selection with criteria: math test, for children until 18 years old, for French-speaker  
→ 22 tests

### 2) Psychometric analyses

- Elaboration of an analyse grid from Gaul Bouchard, Fitzpatrick, & Olds (2009), Ivanova & Hallowell (2013), and Leclercq & Veys (2014)
- 21 criteria about : standardization, validity, reliability, and norms
- 2 co-judges
- Blind analyses
- → 87 % of adequation
- Discussion and reading of manuals together for a consensus

## DISCUSSION

Many math tests are available.

Few of them answers however the psychometric standards.

Some criteria are well considered: standardization and norms.

Some criteria are often missing: validity, reliability.

Our study thus represents help for clinicians to adopt a reflexive practice during the choice of the diagnostic tests in an approach of Evidence-Based Practice.

### Recommendations

- 1) Clinicians: to consider the set of these criteria to judge the relevance of tests
- 2) Future authors of math tests: to do the effort to develop standard, valid, reliable, and normed tools, as well as to give the maximum of information in user manuals for a greater transparency.

## RESULTS : psychometric properties of tests

Tests	Score	Tests	Score
<b>Math tests</b>		<b>General battery with some math subtests</b>	
Examath 8-15	67 %	Exalang 8-11	57 %
Tedi-math Grands	51 %	Exalang 11-15	52 %
WIAT-II	50 %	EDA	45 %
TTR	48 %	Exalang 3-6	40 %
Numerical	48 %	EVAC	38 %
Zareki-R (France)	48 %	N-EEL	38 %
MathEval	43 %	ECHAS	29 %
Zareki-R (Québec)	40 %	PEDA 1C	24 %
Tedi-math	40 %		
B-LM	21 %		
ECPN	19 %		
UDN 2	19 %		
Protocole du calcul élémentaire	19 %		
ERLA	12 %		

## RESULTS : psychometric properties taken into account in the tests

Properties	Score	Properties	Score
<b>Standardization</b>		<b>Reliability</b>	
Qualification of the assessor	82 %	Temporal stability	14 %
Consigns and notation	91 %	Parallel tests	0 %
<b>Validity</b>		Reliability between judges	11 %
Validity of appearance	14 %	Correlations	25 %
Validity of content	45 %	Bisection	5 %
Aims of subtests	91 %	Internal consistency	16 %
Concomitant validity	16 %	<b>Normative data</b>	
Predictive validity	34 %	Sample size	44 %
Validity of construct: individual characteristics	57 %	Sample description	93 %
Factorial validity	14 %	Sample representativeness	52 %
Sensitivity, specificity	2 %	Measures of central tendency	77 %
		Confidence intervals	27 %

