

The Relationship Between the WISC-IV PRI and the Executive Functioning Scale of the BASC-2 in Children Referred for Psychoeducational Assessment

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Abstract

This study addressed whether the PRI of the WISC-IV is a measure of fluid reasoning by correlating the PRI and the Executive Functioning Scale of the BASC-2 in a referred sample. A check was performed using principal factor analysis to insure the factor structure was the same as that of the WISC-IV standardization sample, which was found to be the case. No significant correlations were found between the PRI and the BASC-2 Executive Functioning Scale, suggesting little to no relationship. A significant correlation was found between the Executive Functioning Scale of the BASC-2 and the PSI. This study did not support the hypothesis that the PRI is primarily a measure of fluid reasoning.

Rationale

Contemporary theory as well as neuropsychological and neuroimaging studies suggest that fluid reasoning and executive functioning are related in that:

- 1) Participants with frontal lobe lesions and neuroanatomically typical participants with impairments in executive functioning (e.g., goal management, inductive reasoning) show impaired performance on tests of fluid reasoning (e.g., Culture Fair Intelligence Test, Raven Progressive Matrices)
- 2) Both executive functioning and fluid reasoning recruit a similar fronto-parietal network, with areas of consistent overlap such as the dorsolateral prefrontal cortex, the anterior cingulate cortex, and orbito-frontal regions.
- 3) Theories such as Norman & Shallice's Model of Attentional Control (2000) use an underlying construct common to executive functioning and fluid reasoning predict the wide range of behaviors associated with the prefrontal lobes.

Thus, while fluid reasoning and executive functioning have different origins it is likely the two different approaches led to different definitions of similar underlying processes.

Table 1

Means and Standard Deviations of the WISC-IV Indexes and Subtests in the Referred Sample

Index or Subtest	Index or Scaled Score Mean	Standard Deviation
VCI	92.56	14.90
PRI	94.71	15.00
WMI	85.74	14.59
PSI	86.72	9.72
Vocabulary	8.66	2.42
Similarities	8.96	2.87
Comprehension	8.59	2.56
Block Design	8.96	2.99
Picture Concepts	9.63	2.78
Matrix Reasoning	8.96	2.95
Digit Span	7.64	2.66
Letter-Number Sequencing	7.64	2.69
Coding	7.48	2.11
Symbol Search	7.99	2.40

Note: N = 152

Table 2

Means and Standard Deviations of the BASC-2 Scales in the Referred Sample

Scale	T-Score Mean	Standard Deviation	Range of Scores
Executive Functioning	61.10	10.65	36-89
Somatization	62.19	17.40	42-120
Anxiety	83.53	17.53	48-120

Note: N = 152

Table 3

Referred Sample Rotated Factor Matrix

WISC - IV Subtest (Scaled Score)	Factor			
	1	2	3	4
Similarities	.686	.209	.258	-.059
Vocabulary	.890	.149	.014	-.044
Comprehension	.798	-.022	-.030	.054
Block Design	.072	.775	.158	-.007
Picture Concepts	.102	.358	.343	.004
Matrix Reasoning	.184	.684	.279	.115
Digit Span	.040	.157	.600	.044
Letter-Number Sequencing	.049	.260	.698	.000
Coding	-.028	.086	.009	.780
Symbol Search	-.021	.337	.235	.393

Note. Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization

Method

Participants:

152 children (109 boys & 43 girls) referred for psychoeducational assessment

Ages: 8 – 16 yrs; FSIQ: 70 – 124

Statistical Analyses:

A principal factor analysis with varimax rotation and a forced four-factor solution was conducted to establish whether the present test had the same factor structure as the WISC-IV standardization sample.

The PRI was correlated with the BASC-2 Executive Functioning, Somatization, and Anxiety Scales. Also, the Picture Concepts and Matrix Reasoning subtests together and the Picture Concepts subtest alone were correlated with the BASC-2 Executive Functioning Scale.

Finally, to help minimize developmental differences, the 6 and 7 year olds were removed from the sample (n = 126) and all previously mentioned analyses were performed again.

Results & Conclusions

The principal factor analysis resulted in the same four-factor solution as the WISC-IV standardization sample (Table 3).

The PRI showed no significant correlation with the Executive Functioning Scale ($r = -.06$, $p > .50$). The Executive Functioning Scale did correlate with the PSI ($r = -.18$, $p < .05$, effect size = .03).

As hypothesized, no other significant correlations were found. To help minimize developmental differences, the 6 and 7 year olds were removed from the sample (n = 126). Very similar results were obtained.

The skills tapped by the PRI and, in particular, the Picture Concepts subtest remain unclear.