

Validation of Visual Spatial Classifications within the School Neuropsychological Conceptual Model using Exploratory Factor Analysis in a Mixed Clinical Group Sample

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These data were drawn from an archival sample of 956 mixed clinical case studies with imputed data conducted by students in the School Neuropsychology Post-Graduate Certification Program (2001 - 2010).

School Neuropsychology Conceptual Model of Visual-Spatial Processes (Miller, 2007, 2010)

VISUAL PERCEPTION (WITH MOTOR RESPONSE)

- Visual-Motor Constructions
 - NEPSY-II: Block Construction
 - WISC-IV: Block Design
 - WISC-IV: Block Design No Time Bonus
- Visual Spatial Relations and Directionality
 - NEPSY-II: Route Finding

VISUAL PERCEPTION (MOTOR-FREE)

- Recognizing Spatial Configurations
 - NEPSY-II: Arrows
 - WJ COG: Spatial Relations
- Visual Discrimination and Spatial Localization
 - NEPSY-II: Picture Puzzles
- Visual Matching with Added Memory Component
 - WJ COG: Picture Recognition
- Visuospatial Analyses with and without Mental Rotations
 - NEPSY-II: Geometric Puzzles

Test	Factors and Related Loadings		
	1	2	3
Factor 1: Visual-Spatial Perception			
NEPSY-II: Route Finding	.677	.084	.009
NEPSY-II: Picture Puzzles	.621	-.214	.235
WISC-IV: Block Design No Time Bonus	.587	.154	-.326
WISC-IV: Block Design	.531	.274	-.018
NEPSY-II: Arrows	.510	.000	.290
Factor 2: Visual-Spatial Analyses/Reasoning			
NEPSY-II: Geometric Puzzles	.296	.745	.070
NEPSY-II: Block Construction	.528	.541	.100
Factor 3: Visual-Spatial Thinking			
WJ COG: Spatial Relations	.197	-.047	.754
WJ COG: Picture Recognition	-.077	.204	.753
Percentage of the variance explained by factor	21.70%	17.39%	13.98%
Cumulative percentage of variance explained by factor	21.70%	39.08%	53.07%

Implications:

- The visual-spatial tests did not separate into the motor response and motor-free response factors as predicted in the school neuropsychology conceptual model.
- Factor 1 represents a general visual-spatial perception factor.
- Factor 2 represents tests that require visual-spatial analyses and reasoning.
- Block Construction from the NEPSY-II loads on both Factor 1 and 2.
- Factor 3 is composed of the WJIII-COG subtests that were designed to measure visual-spatial thinking.
- A broader factor analytic study that includes other cross-battery measures of visual-spatial processes is needed to clarify or further validate the school neuropsychological conceptual model.

References:

- Miller, D. C. (2007). *Essentials of school neuropsychological assessment*. Hoboken, NJ: Wiley.
 Miller, D. C. (Ed.) (2010). *Best practices in school neuropsychology: Guidelines for effective practice, assessment, and evidence-based assessment*. Hoboken, NJ: Wiley.