Neurocognitive Performance Predicted by Sensorimotor Functions on the NPCC-3

Alyzae I. Karim, B.A., Nika Rouse, B.A., M. A., Daniel C. Miller, Ph.D., ABPP, and Denise E. Maricle, Ph.D.

Texas Woman's University

Objective

The aim of this study is to investigate how parental concerns of their child's sensorimotor functioning measured by the Neuropsychological Processing Concerns Checklist for School Aged Children and Youth-Third Edition (NPCC-3) predicts how their child performed on the Woodcock-Johnson Normative Update Tests of Cognitive Abilities, Third Edition (WJ III NU COG).

Method

This study utilized data collected from a mixed clinical sample of neuropsychological case studies conducted by trainees in the KIDS, Inc. Post-Graduate School Neuropsychology Training Program. The current sample consisted of 55 – 60 children between the ages of 6 and 18 with various diagnoses, such as Autism Spectrum Disorder (ASD), Attention Deficit/Hyperactivity Disorder (ADHD), and Learning Disability (LD). There was an overall 2:1 ratio of males to females within each analysis from different ethnic backgrounds, including Caucasian, African American, Hispanic, and Asian/Pacific Islander. Standard multiple regression analyses were conducted to evaluate how parental reports of their child's sensorimotor functioning predicted how they performed on different neurocognitive tasks.

Results

Sensory and visual motor functioning on the NPCC-3 did not explain a statistically significant amount of the variance in the GIA, Verbal Ability, Thinking Ability, and Cognitive Efficiency domains on the WJ III NU COG. The analyses indicated that perceived motor function difficulties significantly predicted Thinking Ability and marginally predicted Verbal Ability. As parental concerns regarding motor difficulties increased, a corresponding decrease (or lowering) of scores was seen for both the Thinking and Verbal Ability composites.

Thinking Ability predicted by motor functioning difficulties on the NPCC-3 (N=50).

Model	b	SE-b	β	p	R^2	F	p
Constant	96.800	2.857			.083	1.134	.351
Sensory deficits	.234	1.630	.027	.886			
Motor function difficulties	-2.467	1.184	-.338	.042*			
Visual motor difficulties	.456	2.047	.038	.825			
Sensory sensitivity	.850	1.900	.091	.657			

*Note: *$p < .05$.*

Verbal Ability predicted by motor functioning difficulties on the NPCC-3 (N=57).

Model	b	SE-b	β	p	R^2	F	p
Constant	96.118	2.671			.103	1.490	.219
Sensory deficits	1.406	1.527	.164	.362			
Motor function difficulties	-2.180	1.110	-.308	.055*			
Visual motor difficulties	2.270	1.836	.199	.222			
Sensory sensitivity	-1.416	1.173	-.157	.420			

*Note: *$p < .1$.*

Conclusions

• Parental perception of their child's motor difficulties significantly predicted their child's performance on tasks related to verbal and thinking abilities.

• These results provide professionals insight on the development of different areas of sensorimotor function and possible implications on various components of neurocognitive functioning, such as learning. Furthermore, the NPCC-3 is a tool that professionals can utilize as a screener to determine which areas of functioning are needed to be further assessed.