Structural Validity of a Computerized Neurocognitive Battery for Youth Affected by Human Immunodeficiency Virus in Botswana

Amelia E. Van Pelt, J. Cobb Scott, Knashawn H. Morales, Mogomotsi Matshaba, Ruben C. Gur, Ontibile Tshume, Boitumelo Thuto, Elizabeth D. Lowenthal, Tyler M. Moore

The Children's Hospital of Philadelphia®
Perelman School of Medicine University of Pennsylvania
Botswana-Baylor Children's Clinical Centre Of Excellence

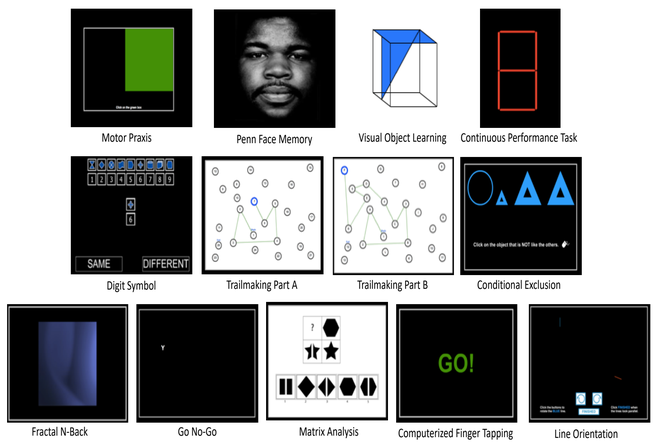
Background

- Perinatal human Immunodeficiency Virus (HIV) infection and exposure (HEU) increase risk of neurocognitive impairment among children
  - Attention, episodic memory, executive functioning, information processing speed, psychomotor functioning
- Sub-Saharan Africa (SSA) is high HIV burden area, but cognitive screening is limited
- **Penn Computerized Neurocognitive Battery (PennCNB)** adapted for use in Botswana

Objective: To assess the structural validity of the PennCNB adapted for use in Botswana

Computerized Neurocognitive Battery

- Streamlines neurocognitive assessment
- Computerized & "game-like" tests
- Measures performance accuracy and response speed on major cognitive domains
- Low-cost & publicly-available

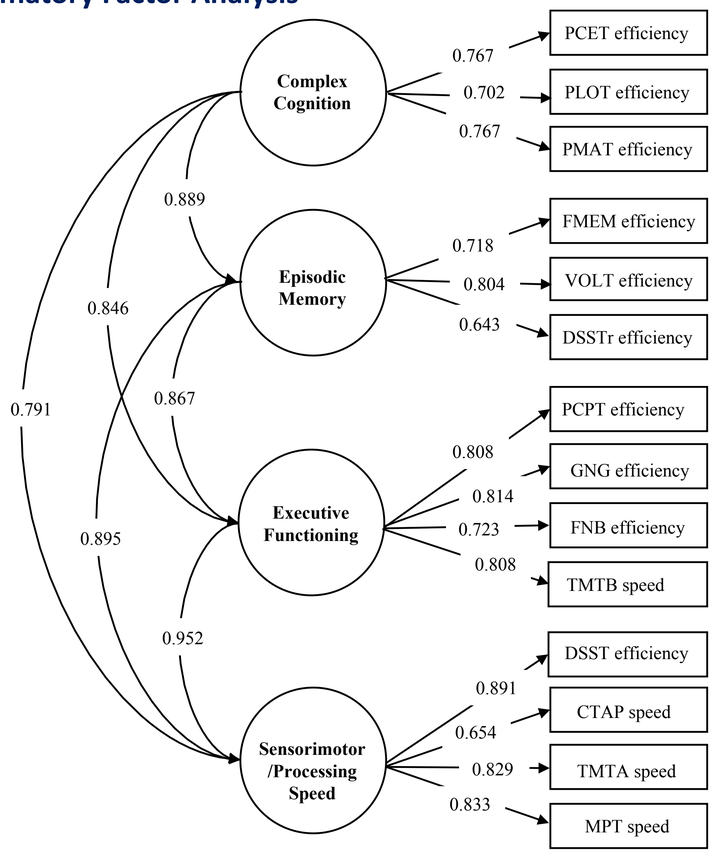


Methodology

- Botswana-Baylor Children's Clinical Centre of Excellence
- N=209, 7-17 years , HIV+ & HEU
- Mean age= 11.54 years
- Setswana (90%) PennCNB, English (10%) PennCNB
- Efficiency score = scale (speed z-score + accuracy z-score)
- Confirmatory & exploratory factor analysis

Results

Confirmatory Factor Analysis



Exploratory Factor Analysis

	Factor			
Module	F1	F2	F3	F4
CPT	**0.88**	0.00	-0.03	0.02
GNG	**0.74**	0.10	0.00	0.06
CTAP speed	**0.59**	-0.14	0.25	-0.01
MPT speed	**0.36**	0.28	0.36	-0.10
FNB	**0.36**	0.14	0.21	0.16
PCET	-0.03	**0.82**	0.00	0.01
PMAT	0.03	**0.67**	0.02	0.13
PLOT	0.29	**0.45**	-0.07	0.09
TMTA speed	0.00	-0.02	**0.94**	0.03
DSST	0.20	0.17	**0.51**	0.18
TMTB speed	0.25	0.37	**0.40**	-0.17
DSSTr	-0.05	0.19	**0.36**	0.32
VOLT	0.23	0.17	0.16	**0.45**
FMEM	0.25	0.22	0.11	**0.30**

Conclusions

- Acceptable fit- confirms theoretical design of battery
- High inter-factor correlation
- EFA suggests tests measuring executive functioning and sensorimotor/processing speed cluster together
- Insight into validity of battery adapted for use in non-Western setting
- Useful tool for Botswana and resource-limited settings

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@AmeliaVanPelt
@jcobbscott
@mogomatshaba
mooremetrics.com