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Objective: Children born to mothers infected with human immunodeficiency virus (HIV) during pregnancy experience increased risk of neurocognitive impairment. In Botswana, HIV infection is common, but standardized cognitive testing is limited. The Penn Computerized Neurocognitive Battery (PennCNB) is a widely used cognitive test battery that streamlines evaluation of neurocognitive functioning. Our group translated and culturally adapted the PennCNB for use among children and adolescents in this high-burden, low-resource setting. The current study examined the construct validity and sensitivity to HIV infection and exposure of the culturally adapted PennCNB among a cohort of HIV-affected children and adolescents in Gaborone, Botswana.

Participants and Methods: 628 school-aged children aged 7-17 years (n=223 children living with HIV [HIV+]; n=204 HIV exposed, uninfected [HEU]; and 201 HIV unexposed, uninfected [HUU]) completed the PennCNB. Participants were recruited from a clinic specializing in the care and treatment of HIV+ children and adolescents in Gaborone, Botswana, as well as from local schools. Confirmatory factor analyses were performed on efficiency measures for 13 PennCNB tests. Multiple regressions examined associations between HIV and neurocognitive functioning while controlling for age and sex. Multivariate normative comparisons were used to examine rates of overall cognitive impairment by comparing individual profiles of test scores to the multivariate distribution of test scores using age-normed data from the HUU group.

Results: Confirmatory factor analysis supported four hypothesized neurocognitive domains: executive functioning, episodic memory, complex cognition, and sensorimotor/processing speed. As expected, there were main effects of age on cognitive performance across all domains ($ps < .001$), and there were small sex differences, with females performing better in executive functioning and males performing better on visuospatial processing. Children and adolescents living with HIV performed significantly worse than HUU across all domains ($ps < .001$), with the largest effect sizes on measures of abstraction, working memory, and processing speed. HEU also performed worse

than HUU across several domains, with smaller effect sizes. Multivariate normative comparisons indicated that 27% of the HIV+ group evidenced global neurocognitive impairment.

Conclusions: Overall, results support the validity of a neurocognitive battery adapted for use in Botswana, a non-Western, resource-limited setting. Results indicated that the adapted battery applied to children and adolescents with limited computer familiarity had a similar factor structure as in Western settings, indicating that the PennCNB appeared to assess the hypothesized neurocognitive domains. Hypothesized associations with age and sex supported the battery's construct validity. Moreover, the battery appears to be sensitive to cognitive impairments associated with perinatally-acquired HIV and in utero HIV-related exposures, as it discriminated between the HUU, HIV+, and HEU groups. Differences were found in specific domains and in detection of overall impairment, including approximately one quarter of children and adolescents living with HIV in this cohort evidencing global neurocognitive impairment. Together, these results provide evidence that the PennCNB could serve as a useful tool for the assessment of neurocognitive functioning in school-aged children and adolescents from Botswana and, potentially, other resource-limited settings.

Categories: Cross Cultural Neuropsychology/
Clinical Cultural Neuroscience

Keyword 1: cross-cultural issues

Keyword 2: HIV/AIDS

Keyword 3: brain development

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4 Educational and Social/Economic Opportunity Associated with IQ in DC Metro Children

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Objective: Social determinants of health (SDOH) are social conditions (e.g., employment, access to healthcare, quality schools) which are

shown by a growing body of literature to impact many health outcomes, including cognition. The development of community-level measures including the Child Opportunity Index (COI) have allowed for increased understanding of the resources and conditions in neighborhoods and their impact on children's health. Given the limited existing research on how neighborhood factors impact cognitive development, this study aimed to examine associations between neighborhood context (COI) and cognitive outcomes in children and adolescents who presented for neuropsychological evaluations.

Participants and Methods: Participants included 4,633 youth (ages 2-22; $M = 10.8$ years; $SD = 4.1$ years; 63% Male; 33% with a medical condition involving the central nervous system [CNS]) living in the DC-VA-MD-WV Metro Area who presented to an outpatient clinic for evaluation and completed an intellectual functioning (IQ) measure (88% Weschler, 11% DAS, <1% Leiter, <1% RIAS). COI values were extracted from electronic medical records based on home address. COI values include an overall index and three domain scores in educational (educational access, quality, and outcomes), health/environment (access to healthy food, healthcare, and greenspace) and social/economic (income, employment, poverty); higher scores indicate higher opportunity. Using metro-based norms, children from all opportunity levels were represented (14% Very Low, 13% Low, 18% Moderate, 21% High, 34% Very High). Multiple regression analyses were conducted to examine main effect associations between COI and Full-Scale IQ (FSIQ), Verbal IQ (VIQ), and Non-Verbal IQ (NVIQ) and explore moderation of age, gender, and medical condition on these associations. Additional regression analyses examined these relationships for the three COI domains.

Results: Controlling for age, gender, and medical condition, neighborhood opportunity was positively associated with cognitive function (FSIQ: $\beta=0.198$; VIQ: $\beta=0.202$; NVIQ: $\beta=0.148$, p 's <0.01). Models accounted for approximately 10-14% percent of the variance in cognitive outcomes (FSIQ: $F[6,4476]=180.331$, $Adj.R^2=0.138$; VIQ: $F[6,4556]=161.931$, $Adj.R^2=0.124$; NVIQ: $F[6,4548]=123.893$, $Adj.R^2=0.098$). Age moderated the association between overall COI and cognitive outcomes (FSIQ: $\beta=0.005$, $p=0.018$; VIQ: $\beta=0.005$, $p=0.043$; NVIQ: $\beta=0.005$, $p<0.01$) such that the association between neighborhood opportunity and cognitive outcomes was stronger at older

ages, though this was a small effect. When examining subdomains of COI, cognitive outcomes were associated with educational (FSIQ: $\beta=0.094$; VIQ: $\beta=0.099$; NVIQ: $\beta=0.078$, p 's <0.01) and social/economic opportunity (FSIQ: $\beta=0.115$; VIQ: $\beta=0.121$; NVIQ: $\beta=0.084$, p 's <0.01) but not health/environmental opportunity (FSIQ: $\beta=-0.001$, $p=0.991$; VIQ: $\beta=-0.008$, $p=0.581$; NVIQ: $\beta=-0.008$, $p=0.553$). Medical diagnosis moderated the association between social/economic opportunity and FSIQ; there was a stronger association between IQ and COI in youth with a medical diagnosis ($\beta=-0.071$, $p<0.05$).

Conclusions: These findings demonstrate the importance of neighborhood factors, especially education and social/economic opportunities, on cognitive development. Children living in higher opportunity neighborhoods showed higher cognitive functioning. Older age and CNS-involved medical conditions were associated with higher risk in the context of reduced neighborhood opportunities. These findings emphasize the need for advocacy and other efforts to improve community resources (e.g., access to early childhood education) to address inequities in cognitive development.

Categories: Cross Cultural Neuropsychology/
Clinical Cultural Neuroscience

Keyword 1: intellectual functioning

Keyword 2: environmental pollutants /
exposures

Keyword 3: pediatric neuropsychology

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Poster Session 03: Dementia | Amnesia | Memory | Language | Executive Functions

12:00 - 1:15pm

Thursday, 2nd February, 2023
Town & Country Foyer

1 Efficacy of Digital and Non-Digital Compensatory Strategies in Supporting Prospective Memory Task Completion