

45.4±8.49 years old, education: 14.4±2.27 years) completed the touch-panel HAND screening battery which assessed six NP domains by seven subtests, everyday functions, and depression. A micro error is defined as a subtle action disruption or hesitation occurring immediately before making final actions. We evaluated the micro errors in short-term memory (STM) and long-term memory (LTM) of verbal learning tests (VLT).

**Results:** Mann Whitney U tests revealed that the HIV+ group made significantly more micro errors on both STM (HIV+: 1.45±0.90 times, Healthy: 0.52±0.84 times) and LTM (HIV+: 1.85±0.73 times, Healthy: 1.29±0.71 times) than the healthy group (STM:  $W=1362$ ,  $p<.001$ , Effect Size (EF)= .548; LTM:  $W=1199.5$ ,  $p=.002$ , EF= .363). An independent samples T-test showed that the HAND group made significantly more micro errors than the non-HAND group ( $t=1.822$ ,  $p=.038$ , ES= .595) on STM; moreover, the Asymptomatic Neurocognitive Impairment (ANI) group made significantly more micro errors than the healthy group ( $W=446$ ,  $p<.001$ , ES= .689). On LTM, no significant micro error differences between HAND and non-HAND ( $W=184.5$ ,  $p=.539$ , ES= -.189) nor between ANI and healthy group ( $W=327.5$ ,  $p=.103$ , ES= .241) were found.

**Conclusions:** The present study suggests that a novel behavioral measure, micro errors, may be able to help detect even the mildest form of HAND, ANI. Given that the touch-panel HAND screening battery consists of NP and IADL tests, it is important to evaluate micro errors on these various measures. Additionally, the touch-panel screening battery requires minimal administrative staff involvement, which could be beneficial for busy HIV clinicians.

#### Categories:

Assessment/Psychometrics/Methods (Adult)

**Keyword 1:** HIV/AIDS

**Keyword 2:** assessment

**Keyword 3:** test development

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### 15 Construct Validity of the Stroop Interference task in Youth and the Contribution of Effort

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**Objective:** Previous literature has studied the cognitive processes that contribute to performance on the Stroop interference condition in adults and found that the Stroop task performance (i.e., color-word interference) is comprised of multiple cognitive skills, including speed of visual search, working memory, and conflict monitoring (Perianez et al. 2020). However, the relationship of these cognitive processes to Stroop interference in youth remains understudied. Moreover, no studies have examined the contribution of effort measurement to the interference condition in healthy youth.

**Participants and Methods:** Golden Stroop Test interference performance was examined in healthy youth athletes ( $n=174$ ) aged 8-16 years (mean age=12.07) who participated in a baseline neuropsychological evaluation as part of a clinical research program on sports concussion. Predictor variables included speed of visual search, working memory, processing speed, verbal fluency effort (i.e., validity tests), visuospatial abilities, visual processing, and executive functioning skills such as cognitive flexibility and reasoning.

**Results:** Speed of visual search as measured by Trail Making Test visual scanning time ( $p<0.00$ ), and effort as measured by Reliable Digit Span and Trail Making Test ratio ( $p=0.03$ ;  $p<0.00$ , respectively) significantly contributed to Stroop interference performance in healthy youth. We provided three validity measures; however, only those requiring higher-order cognitive processes predicted Stroop performance: Reliable Digit Span ( $p=0.03$ ) and the Trail Making Test ratio ( $p<0.00$ ). The standalone validity measure (TOMM) was not a significant predictor of Stroop performance ( $p>0.05$ ).

**Conclusions:** In contrast to adults, working memory and processing speed did not significantly predict Stroop performance, while visual search speed did predict Stroop interference. Furthermore, two embedded validity indicator (EVI) measures predicted Stroop interference, in contrast to a standalone validity measure requiring lower cognitive processes, which did not predict Stroop performance. Therefore, EVI's that include an

executive functioning component may not accurately represent effort in youth, perhaps due to their less developed executive functioning relative to adults (Lezak et al., 2012; Shanmugan & Satterthwaite, 2017). Overall, understanding the cognitive processes contributing to Stroop performance in healthy youth will allow clinicians to better detect deficits in those cognitive processes and understand how they may impact Stroop performance. This would lead to a better understanding of executive functioning and the accurate measurement of effort in healthy youth.

### Categories:

Assessment/Psychometrics/Methods (Child)

**Keyword 1:** executive functions

**Keyword 2:** effort testing

**Keyword 3:** validity (performance or symptom)

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## 16 Development of a Systematic Scoring System to Measure Adherence to a Temporal-Spatial Heuristic when Completing the Rey Complex Figure Task

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**Objective:** It has been established that capturing how an individual draws the Rey Complex Figure Task (RCF) is as important as assessing what is drawn (Rey, 1941, Osterrieth, 1944). Despite the development of multiple systems that have been designed to measure these qualitative characteristics there are still no systematic means to measure adherence to the temporal-spatial heuristic that represents a typical drawing practice in healthy, neurotypical adults (Visser, 1973; Hamby et al, 1993). This study sought to develop a system for scoring temporal-spatial adherence when drawing the figure to provide objective, continuous data.

**Participants and Methods:** Fifty-three English-speaking adults (mean age 44.61 yrs, SD 12.48; 44 female) were recruited. Exclusion criteria included vision and hearing impairment not

corrected by aids; neurodivergent, neurological or psychiatric diagnosis, cancer or brain injury history. Participants completed the RCF copy phase as part of an extended neuropsychological battery. The RCF drawing process was recorded via video and a ball-point pen that digitally recorded drawing. Order data for the 18 RCF elements (Osterrieth, 1944, Taylor, 1959) was recorded by two scorers and analysed via Principal Component Analysis (PCA) with an equimax rotation to identify elements typically drawn together by a healthy, neurotypical adult. Using scoring methodology adapted from Geary et al (2011), the extent to which participants drew consecutively the member elements of each factor or 'strategy cluster' was calculated and recorded. Strategy Cluster Scores across the population sample were examined to understand normative performance.

**Results:** Order data was examined for interrater reliability via Pearson's correlation coefficient and was considered good ( $r^2 = 0.78$ ,  $p < 0.001$ ). PCA identified four factors or 'strategy clusters' that were statistically robust and accounted for 67.34% of total variation. The strategy clusters were Core Structure (rectangle, diagonal, horizontal, vertical); Triangular Structure (triangle, horizontal in triangle, vertical in triangle, diamond); Internal Left-Hand Side (four horizontal lines, smaller rectangle, horizontal in top-left quad); and Internal Right-Hand Side (five lines, circle, vertical top-right quad, small triangle). The mean RCF Strategy Cluster Score was 6.23 (SD 1.94; possible range: 2.75 to 10). Population data spread indicated that healthy neurotypical adults only partially observed a temporal-spatial heuristic, rather than strict, absolute adherence.

**Conclusions:** Four strategy clusters were identified where cluster members were typically drawn consecutively. RCF Cluster Strategy scoring was shown to measure the temporal-spatial heuristic objectively, providing continuous data that lends itself to clinical standardisation. Further, the study demonstrated that whilst healthy, neurotypical adults copy the RCF using a temporal-spatial heuristic, it is only partially adhered to. Traditionally deviation from strict adherence to the four strategy clusters during drawing was deemed to be indicative of cognitive dysregulation, however our findings demonstrate a normal distribution of typical population performance. These findings have important implications for interpreting how RCF drawing strategy informs clinical assessment