

Health Literacy and Prospective Memory in HIV Seropositive Individuals

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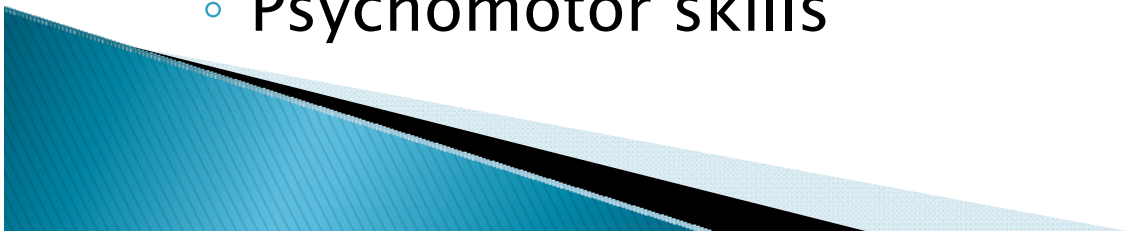
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Supported by R01 DA 18066

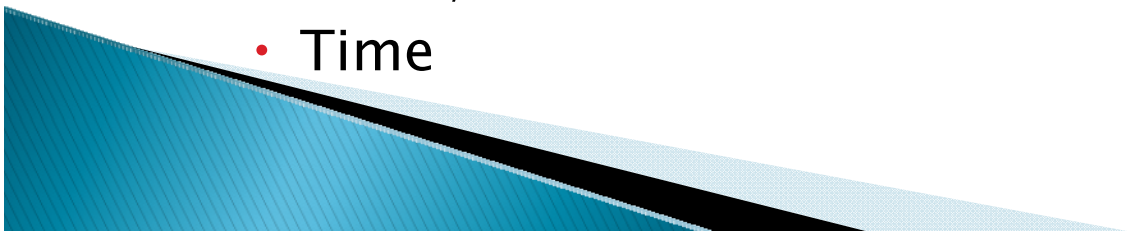
Background

- ▶ HIV infection disproportionately affects persons of low SES
- ▶ This group also at risk for low health literacy
- ▶ HIV infection associated with cognitive impairment
 - Information processing speed
 - Executive skills or problem solving
 - Memory/Attention
 - Psychomotor skills



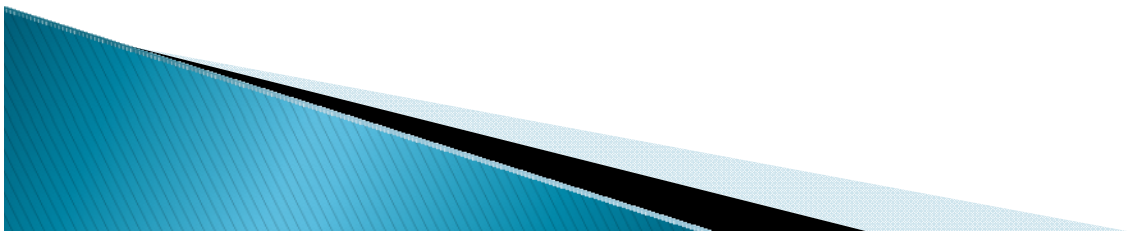
Background

- ▶ Adherence to combination antiretroviral therapy essential for effective HIV treatment
- ▶ Low health literacy and cognitive impairment associated with poor medication adherence
- ▶ Recent evidence points to prospective memory as important for medication adherence
 - Prospective memory is “meta-memory” or the ability to remember to remember
 - Event/Cue
 - Time



Purpose

- ▶ Interest in understanding the relationship between health literacy and cognition
- ▶ Prospective memory and health literacy, how are they related?
- ▶ Our study attempted to address some of these questions
 - Which cognitive skills are also needed to be health literate?
 - How is health literacy affected by cognitive impairment?



Prospective Memory Test



- ▶ Event based memory task
 - When this timer goes off, I want you to pick up this envelope which will be in front of you and give me a five-dollar bill. I want you to give yourself a ten-dollar bill.

- ▶ Time based memory task
 - When this clock reaches 8:15, I want you to interrupt whatever we are doing and ask me to give you this envelope. I want you to then open the envelope and give me the card with the number 17.

Category Test



Halstead, 1947

Digit Span Test



- ▶ Digits Forward

- Examiner “1 – 3 – 9”
- Test-taker “1 – 3 – 9”

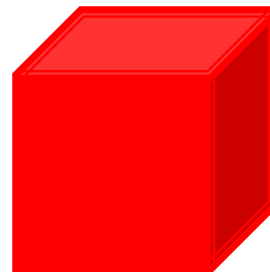
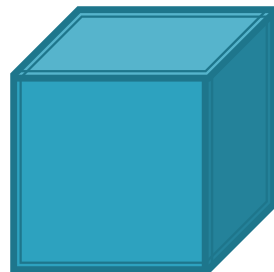
- ▶ Digits Backward

- Examiner “6 – 2 – 7”
- Test-taker “7 – 2 – 6”

- ▶ Measures working memory and attention

Reaction Time

- ▶ Hallmark feature of HIV infection is slowed information processing and reaction time
- ▶ CalCAP (California Computerized Assessment Package) measures simple and choice reaction time in milliseconds



Symbol Digit Modalities Test

- ▶ Symbols with corresponding, unique numbers
- ▶ Write number for each symbol
 - Timed test
 - Measures information processing speed

⌐	≠	⊃	△	◻	∧
1	2	3	4	5	6

△	⌐	∧	≠	⊃	◻

Vocabulary Test

- ▶ Requires defining a list of increasingly difficult vocabulary words
- ▶ Very good indicator of general intelligence

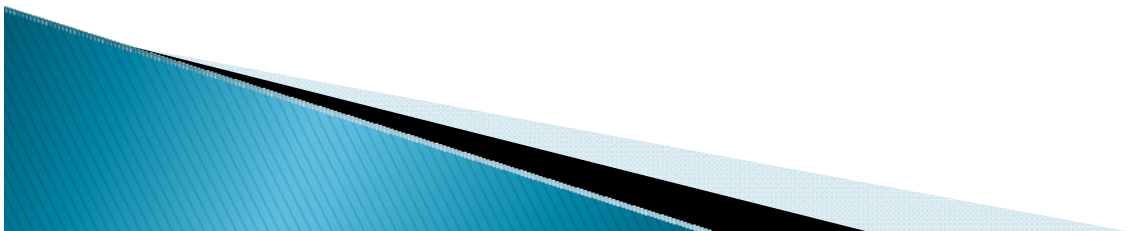
- roof
- yolk
- comply
- homogenous
- vituperation



Wechsler Adult Intelligence Scale

Participants and Methods

- ▶ 76 HIV+ cocaine/heroin users
 - 63% men
 - 84% African American
 - Average age = 43 yrs
 - Average years of education = 11.2
 - 34% had CD4 cell counts < 250 cells/uL
- ▶ S-TOFHLA as dependent variable
 - 28% of pts scored < 80% correct



Results: Multiple Regression

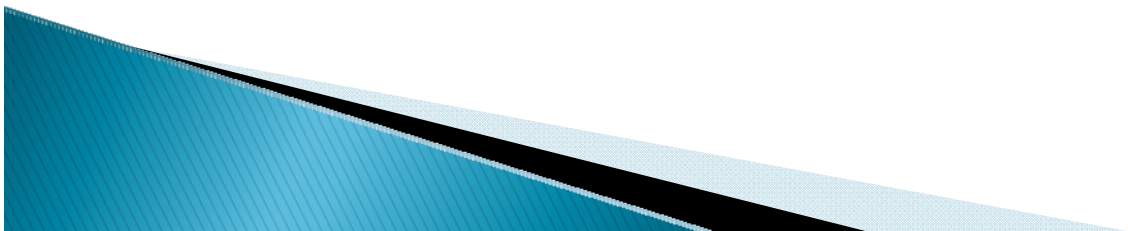
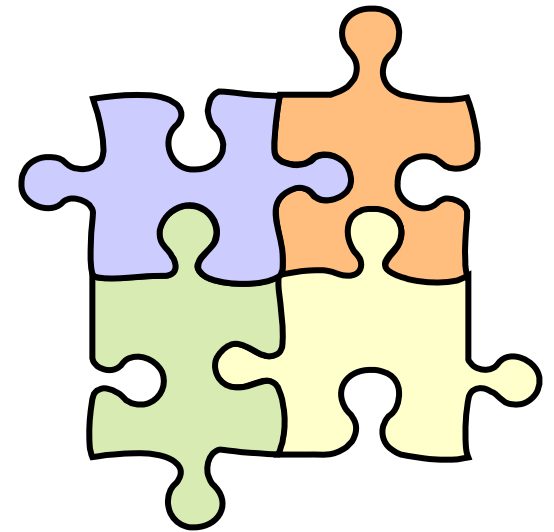
	Step 1	Step 2
CD4 cell counts	.023 (.001)	.051 (.001)
Age	-.135 (-.134)	.074 (.073)
Gender	.045 (.538)	.052 (.625)
Hispanic/Latino	.016 (.350)	.003 (.060)
→ Education	.351 (1.019)**	-.002 (-.006)
→ Category Test		-.182 (-.078)*
CalCAP Reaction Time		.128 (.817)
→ Prospective Memory		.250 (.994)**
Digit Span		.092 (.175)
→ Symbol Digit		.411 (.248)**
→ Vocabulary		.246 (.129)*
R ²	.135	.637**
R ² _Δ	.135	.502**

Note: Results are presented as Beta values with B values in parentheses.

** $p < 0.05$; ** $p < 0.01$*

Conclusions

- ▶ Health literacy, as measured by the TOFHLA, related to –
 - Prospective memory
 - Concept formation/problem solving
 - Information processing speed
 - General cognitive ability (verbal ability)



Conclusions

- ▶ Construct validity
 - TOFHLA construct validity shown by correlating with the WRAT-R and REALM (*Parker, Baker, Williams, & Nurss, 1995*)
- ▶ Construct validity also demonstrated with relation to complex cognitive skills in present study
- ▶ Beyond basic and general cognitive abilities, health literacy may be related to complex abilities including meta-memory and concept formation.



Acknowledgements

- ▶ Thanks to:
 - Lisa Metsch, Ph.D.
 - Mahendra Kumar, Ph.D.
 - Dushyantha Jayaweera, M.D.
 - Allan Rodriguez, M.D.
 - Peggy Gonzalez
 - Jesline Jean-Simon
 - Laurel Hall

