



Back to The Future: Linking Early Psychiatric Symptoms to Trans-diagnostic Cognitive Impairments

INTRODUCTION

→ **Cognitive Impairments** (problems in abilities to think, learn, remember, use judgement, and make decisions) are fundamental aspects of various mental health disorders, and often **present long before the onset of psychiatric symptoms**.

→ Certain **psychiatric disorders are heritable**; having a close relative with a mental disorder could put youths at a higher risk.

→ Cognitive impairment is presented in many psychiatric disorders.

→ A growing movement to consider psychiatric symptoms at the **trans-diagnostic level** (e.g., Hierarchical Taxonomy of Psychopathology) may be more helpful in predicting functional trajectory than traditional disorder-specific classification systems.

RESEARCH QUESTION: IS THERE A LINK BETWEEN EARLY PSYCHIATRIC SYMPTOMS WITH COGNITIVE IMPAIRMENTS IN AT-RISK YOUTHS FROM A TRANS-DIAGNOSTIC PERSPECTIVE?

METHODS

Measurements

NIH Toolbox Cognition Battery:

Tests: Oral Reading Recognition, Dimensional Change Card Sort, Flanker Inhibitory Control & Attention, List Sorting, Pattern Comparison, Picture Sequence, and Picture Vocabulary

K-SADS:

Mania and Psychosis

Depression, Panic Disorder, Agoraphobia, Separate Anxiety Disorder, Social Anxiety Disorder, Generalized Anxiety Disorder, Eating Disorders, PTSD, Sleep Problems and Suicide Disruptive mood dysregulation disorder, ADHD, ODD, Conduct Disorder, Tic Disorder, Autism Spectrum Disorder, Alcohol Use Disorder and Substance Use Disorder

HiTOP:

Psychosis
Emotional Dysfunction
Externalizing

PARTICIPANTS:

→ Data were obtained from the **ABCD Study**® 5.0 data release.

→ **970 at-risk youths aged 8-12** with hospitalized first-degree relative(s), matched with 969 controls with similar age and gender.

MEASUREMENTS:

→ **NIH Toolbox Cognition Battery** for cognitive performances.

→ **K-SADS** for psychiatric symptoms and grouped by **HiTOP** domains.

DATA ANALYSIS:

Between NIH Toolbox cognitive performances and dimensional HiTOP psychiatric symptoms

Data not normally distributed:

→ **Comparison:** Mann-Whitney U Test

→ **Correlation:** Spearman's rank correlation test

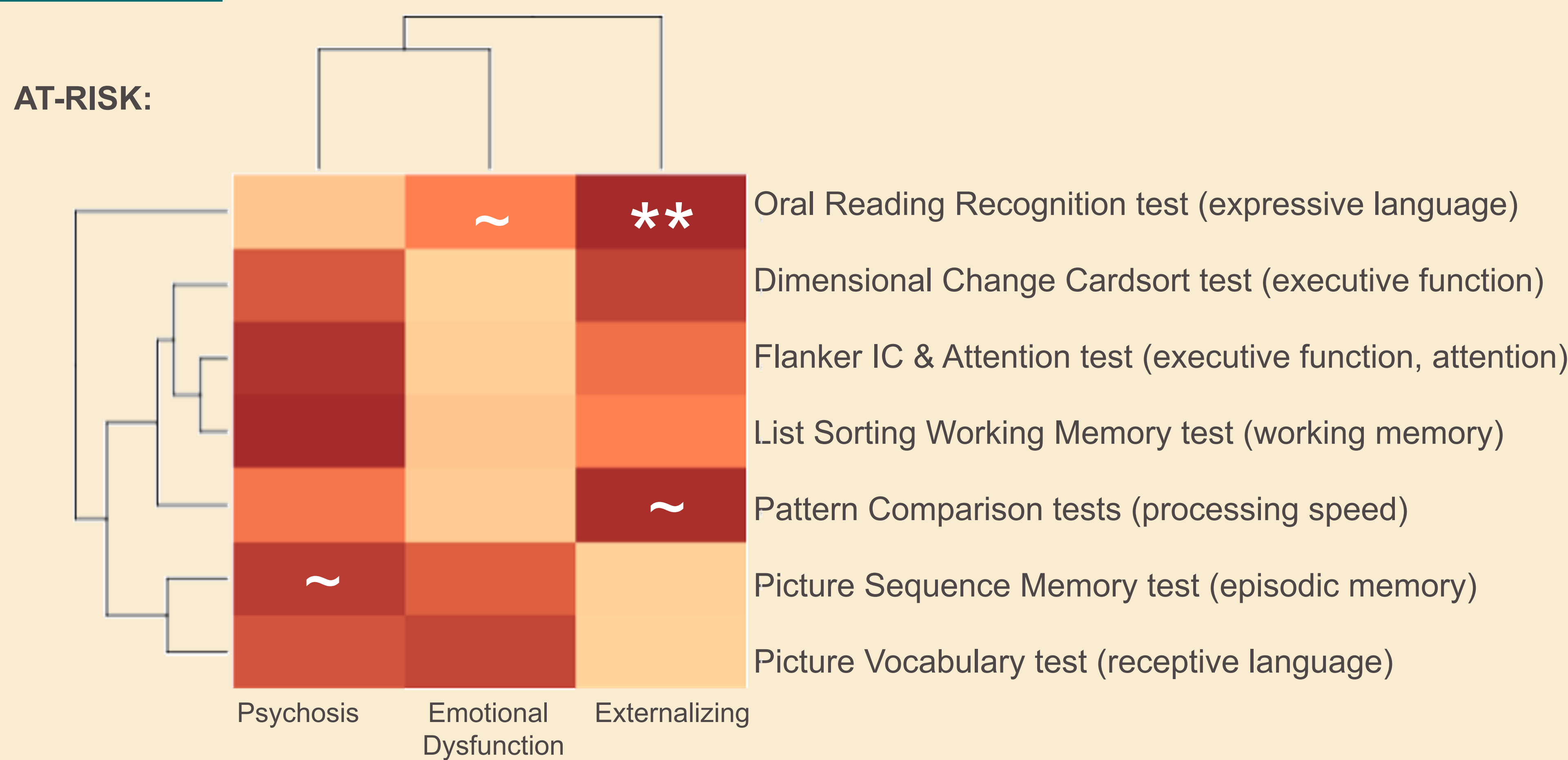
→ Statistical significances are reported if **p<0.001**, and trends are reported if **0.05<p<0.10**.

RESULTS

COMPARISON BETWEEN COGNITIVE IMPAIRMENTS AND PSYCHIATRIC SYMPTOMS IN YOUTHS

	Participants groups				Comparison		
	At Risk [970]		Control [969]		W value	P value	Cohen's d
Demographics	M	SD	M	SD			
Sex	509 (461)		500 (469)				
Age	9.47	0.513	9.47	0.501			
NIH Toolbox Cognitive Battery							
Total composite score	97.2	17.0	98.7	18.7	424000	0.088	-0.086
Fluid composite	92.9	17.1	94.1	18.0	426968	0.169	-0.070
Dimensional Change Card Sort	94.6	14.6	95.6	14.5	435906	0.056	-0.074
Flanker Inhibitory Control and Attention	94.7	13.9	95.0	13.9	454540	0.689	-0.021
Picture Sequence Memory (Form A)	99.0	15.4	101	16.0	428168	0.013*	-0.106
List Sorting Working Memory	98.3	17.1	99.7	15.3	432644	0.067	-0.097
Pattern Comparison tests	92.4	17.1	91.8	18.0	464474	0.587	0.027
Crystallized composite	103	17.1	104	18.3	431025	0.123	-0.070
Picture Vocabulary	105	6.2	106	17.8	438486	0.083	-0.078
Oral Reading Recognition tests	100	17.8	101	18.1	443880	0.259	-0.049
HiTOP domains							
Emotional Dysfunction	3.91	6.03	2.90	4.57	512037	<0.001***	0.188
Psychosis	1.91	3.78	1.47	3.11	489305	0.059	0.127
Externalizing	0.05	0.34	0.02	0.25	475287	0.058	0.073

CORRELATION BETWEEN COGNITIVE IMPAIRMENTS AND PSYCHIATRIC SYMPTOMS IN YOUTHS



CORRELATION COMPARISON BETWEEN AT-RISK AND CONTROL (p-values)

NIH Toolbox Performances	HiTOP Domains		
	Psychosis	Emotional Dysfunction	Externalizing
Oral Reading Recognition tests	0.074	0.133	0.576
Dimensional Change Card Sort	0.960	0.301	0.726
Flanker Inhibitory Control and Attention	0.865	0.726	0.589
List Sorting Working Memory	0.928	0.303	0.059
Pattern Comparison tests	0.401	0.646	0.322
Picture Sequence Memory (Form A)	0.298	0.453	0.952
Picture Vocabulary	0.129	0.509	0.016**

DISCUSSION

→ At-risk youths performed worse than controls in NIH Toolbox tasks → signs of early cognitive impairment.

→ At-risk youths higher in HiTOP symptoms → signs of higher prevalence in early psychiatric symptoms.

→ Distinctions between youth psychiatric symptoms and cognitive performance correlate → some cognitive impairments may be more evident starting from an early age than others.

→ Differences in psychiatric symptoms and cognitive performance correlation between the two samples → at-risk youth may show differences in transdiagnostic cognitive impairments as early as 8-12 years old.

→ Findings suggest a link between early psychiatric symptoms with cognitive impairments in at-risk youths.

LIMITATIONS:

→ Effect size is small, non-clinical sample → harder to detect relationships (weak correlations).

→ Children are very young → wider-spread, higher-level cognitive impairments and severe symptoms may not be yet developed (small comparisons).

FUTURE DIRECTION:

→ Set foundation for later longitudinal studies on psychiatric symptoms trajectory prediction.

→ Call for early cognitive and mental health intervention for at-risk children.

→ Look into the effect of nature and nurture during at-risk youths' upbringing.

References:

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