Resting-State Associations of Schizophrenia-Like Symptoms

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INTRODUCTION

- Psychosis is a complex phenomenon characterized by delusions & hallucinations.
- Psychotic disorders present **19 symptoms** classified as: positive, negative, or cognitive.
- Despite the lack of **symptom-specific treatments for negative** and cognitive symptoms, few functional connectivity studies evaluated these symptoms **individually**.
- **Premorbid/prodromal** Individuals present a window of opportunity to study the biological symptom mechanisms individually. Our sample is in the premorbid stage.

Positive Symptoms	Negative Symptoms	Cognitive Symptoms
Psychotic Delusions Hallucinations Grandiosity Suspiciousness Disorganized Communication	Avolition Flat Affect Anhedonia Occupational Functioning	Trouble with Focus, Attention, and Memory Bizarre Thinking Impairment in Personal Hygiene

Developmental Stages of Psychotic Disorders

How are resting-state networks differentially associated with overall and individual symptom domains?

Do the total and individual symptoms share identical resting-state functional mechanisms?

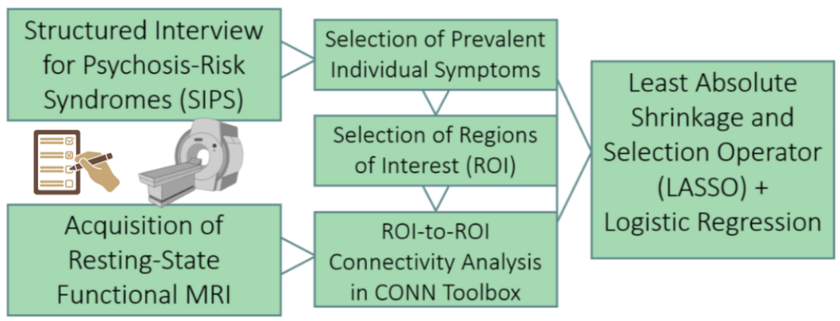
METHODS

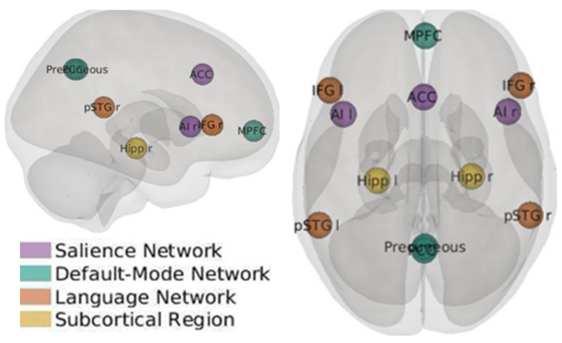
Transdiagnostic study of 122 adolescents:

Ages 9-16
70 males

50 asymptomatic
72 symptomatic

No diagnosis of CHR nor psychosis nor mood disorder





Outcome Groups
Control
Total Positive
Total Negative
Total Disorganized
Perceptual Abnormalities
Trouble with Attention
Dysphoric Mood
Avolition

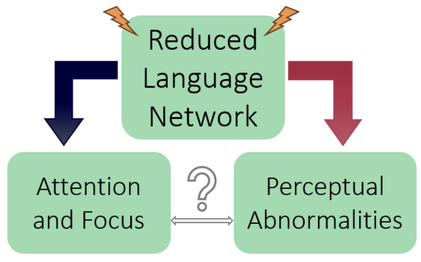
RESULTS

Which of the 66 Resting-State Connections Is Highly Correlated with the Prevalence of Which Symptoms in this Subsyndromal Sample ?

LASSO identified 10 symptom-connectivity associations, all significant when run in the logistic regression controlling for age and sex. Most psychotic-like symptoms were associated with *reduced* resting-state connectivity.

Symptom Groups		Resting-State Connection
Total Negative Symptoms	−	MPFC x Right AI
	−	PCC x Precuneus
	−	ACC x Left pSTG
	+	Left Hippocampus x Right IFG
Total Positive Symptoms	−	MPFC x Right Hippocampus
	−	Right IFG x Left pSTG
Total Disorganized Symptoms	−	Right IFG x Left pSTG
Trouble with Attention	−	Right IFG x Left pSTG
Perceptual Abnormalities	−	MPFC x Left Hippocampus
Dysphoric Mood	−	MPFC x Left pSTG

DISCUSSION



Challenge : High Symptom Overlap
100% with Positive Symptoms
70% with Cognitive Symptoms
60% with Negative Symptoms

- Decreased connectivity between language areas (IFG and pSTG) has been previously associated with **positive symptoms** and now with **attention** deficits.
- Positive symptoms and **perceptual abnormalities** were related to decreased fronto-hippocampal connectivity, previously seen in schizophrenia patients and misinterpreted as a consequence of **cognitive symptoms**.
- **Negative symptoms** showed the greatest number of associations: decreased network connectivity within the default-mode (DM), between the DM and the salience, and between the DM and the language.
- The connectivity association with **dysphoric mood** might be beneficial to diseases with overlapping symptoms.

MAIN TAKEAWAYS AND REFERENCES

- Connectivity of the Default-Mode, Salience, Language Networks and Hippocampus was correlated with symptoms of psychotic disorders **before** the prodromal stage.
- Total and individual symptoms might arise from **similar yet not identical** connectivities. Further research is needed with a more symptomatic sample.