Cognition in Schizophrenia and Psychosis-Spectrum Disorders: Experiences, Assessment, and Intervention

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Objectives

- Discuss current research findings on cognitive deficits and common cognitive symptoms in schizophrenia and other psychosis-spectrum disorders.
- Describe how cognitive impairment is typically assessed via neuropsychological or other cognitive testing.
- Identify evidence-based interventions for cognitive deficits and compensatory strategies that can be used with individuals with schizophrenia or, more broadly, clients with serious mental illness who report cognitive symptoms.

Schizophrenia

1887 – “dementia praecox”

1911 – “schizophrenia”

DSM-III and DSM-IV

Five subtypes:

1. Paranoid
2. Catatonic
3. Disorganized
4. Undifferentiated
5. Residual

DSM-5

“Schizophrenia Spectrum and Other Psychotic Disorders”

Schizophrenia

- For a diagnosis, the person has to experience at least two of the following symptom clusters, for a significant portion of at least one month:
  - Delusions – false beliefs based on inaccurate interpretations of reality
  - Hallucinations – abnormal perceptual experiences (e.g., hearing things, seeing things that aren't there)
  - Disorganized speech – thoughts and speech bounce around, difficult to follow the person's train of thought
  - Disorganized or catatonic behavior
    - Disorganized behavior is behavior that goes against social norms
    - Catatonic behavior is typically absence of behavior. Person doesn't speak, or respond. Can also be repetitive or stereotyped behavior.
  - Negative symptoms – deficits in typical behavior or emotion

Positive symptoms of schizophrenia

- We think of positive symptoms as experiences that are *not* present in a healthy person, but *are* present in schizophrenia.

Hallucinations – abnormal perceptual experiences

Auditory
Hearing voices, sounds. Voices may comment on what the person is doing, insult the person, tell the person to just kill himself or (more rarely) to hurt someone else

Visual
Seeing ghosts, shapes, shadows, animals, people, lights, bugs, etc.

Tactile
Feelings of electricity, tingling, burning, bugs crawling, weight or pressure on the skin

Olfactory
Smelling burning, chemicals, urine, poison, perfume. Sometimes pleasant, generally not

Gustatory
Unpleasant tastes, like metal, blood, urine, ash, all manner of unsavory things

Positive symptoms – delusions

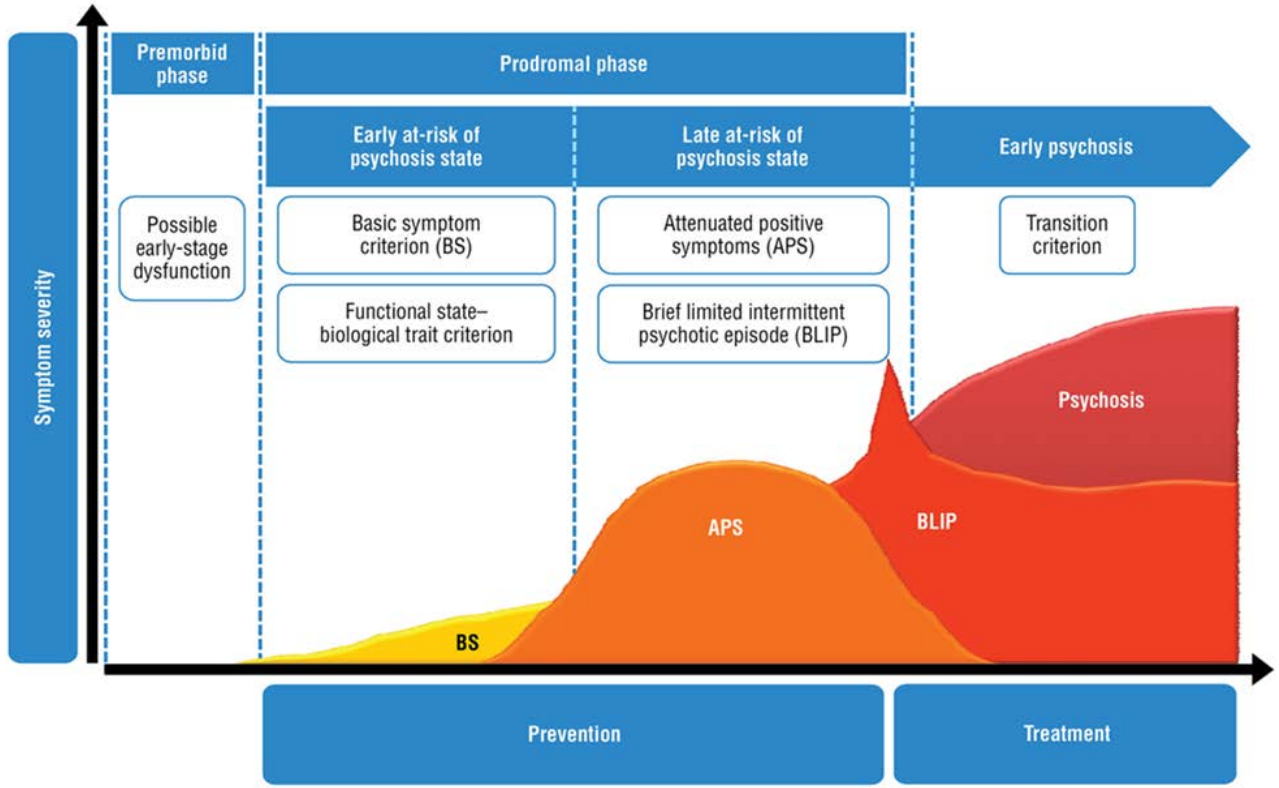
- Delusions can present with many different themes:
  - Reference – belief that ordinary things or experiences have special meaning for the person
  - Persecution – belief that some other person or entity is out to harm, kill, or defame the person
  - Religious – belief in some sort of religious process or power that is (IMPORTANT) out of proportion or not in line with what other people of that religious background believe
  - Grandiose – exaggerated beliefs of importance, status, intelligence, etc.
  - Mind Reading/Thought Interference – belief that external forces can read or control one's thoughts
  - Guilt – exaggerated feelings of guilt over some real or perceived wrongdoing

Negative symptoms

- Negative symptoms are NOT present in schizophrenia that ARE typically present in those without
  - Lack of motivation (avolition)
  - Lack of energy (anergia)
  - Lack of interest in things
  - Diminished experience of pleasure
  - Flattened/Blunted affect
  - Reduction in speech

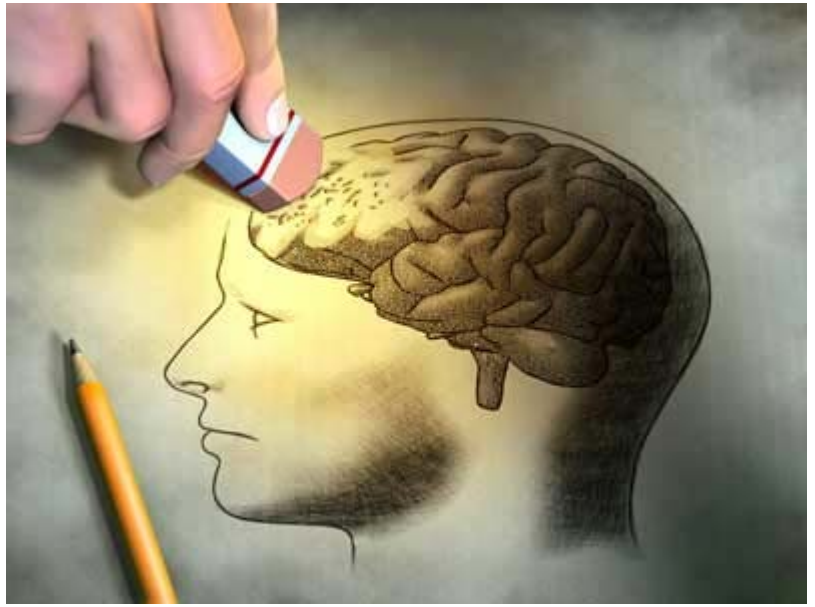
Prodromal and early psychosis

- Schizophrenia progresses in phases
- Early signs and disturbances can be seen in retroactive analyses of the person's behavior and interactions (premorbid phase)
- Prodromal phase – symptoms develop further; others can start to notice something might be wrong
- Early psychosis is when the person has their first episode, or "break"
  - Symptoms interfere with functioning, typically leads the person to be in the hospital for a brief or extended period, depending on severity



Cognitive symptoms

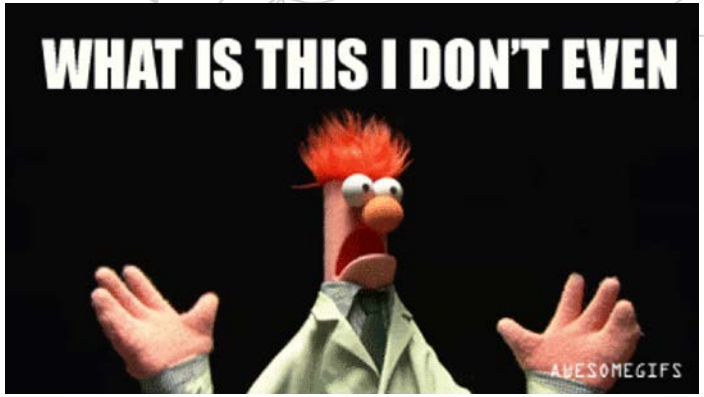
- Deficits have been found in:
  - Attention/Vigilance
  - Reasoning/Problem solving
  - Working Memory
  - Verbal Fluency
  - Visual learning/memory
  - Verbal learning/memory
  - Social learning
    - Social cognition
- Individuals with schizophrenia are typically found to have lower IQ than controls



Schizophrenia: Neurodevelopmental or Neurodegenerative?

- Cross sectional research looking at different phases of the illness
  - Some evidence that UHR<FEP<chronic schizophrenia
  - We tend to see greater functional decline in chronic schizophrenia
  - Possibly supports a model of cognitive deterioration over time
- Robust support for schizophrenia as a neurodevelopmental condition
  - Cognitive deficits are usually seen prior to the onset of illness
  - Tend to stabilize after first episode and follow a typical course of progression over the lifespan
  - Suggests that we wouldn't expect cognitive decline to be solely attributable to the "natural course" of schizophrenia

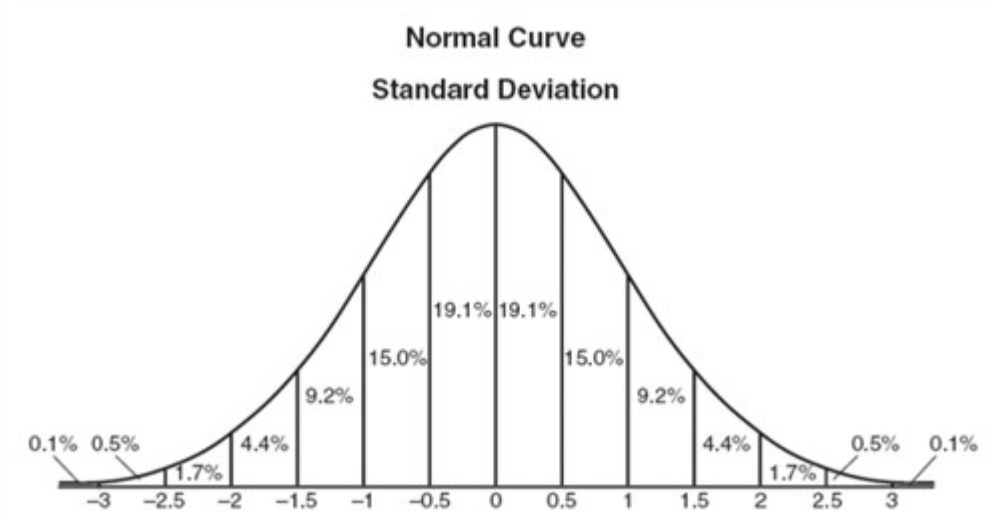
Neuropsychology?



- A science of brain-behavior relationships
  - The study of brain structures, networks, and functions as they relate to specific psychological processes and behaviors
  - Behavioral expression of brain dysfunction
- Integrates knowledge of clinical psychology, neuroscience, psychometrics, pharmacology and others.
- Typically PhD or PsyD in Clinical Psychology or related field, plus internship and 2 year postdoc.
  - Many go on to become board-certified (e.g., ABPP)

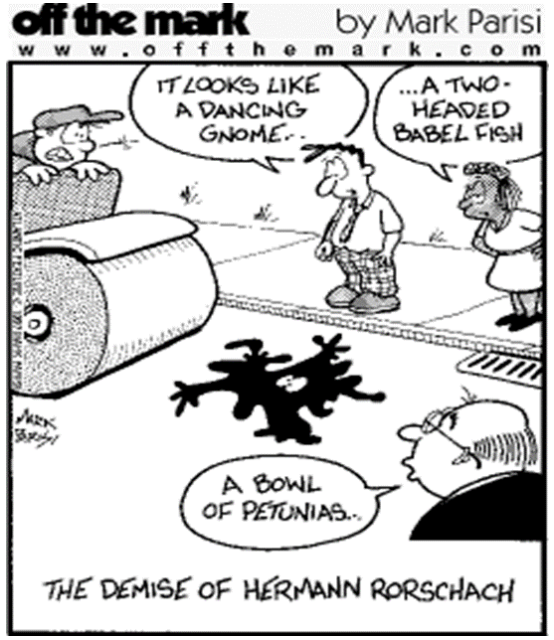
Neuropsychological Assessment

- Involves a battery of tests (usually pencil-and-paper) designed to measure different facets of cognition
- Test scores are compared to a normative sample according to key demographic characteristics
- Strengths and weaknesses are determined relative to a person's age group (most frequently), as well as sex and education level when possible



The “Typical” Evaluation

- Baseline level of functioning
- Intellectual functioning
- Sensory-motor skills
- Processing Speed
- Attention
- Memory



- Receptive & Expressive Language
- Visuospatial / Visuoconstruction
- Executive functions
- Effort
- Mood, personality, pain, etcetera

Common Referral Questions

- Deficit in a specific function (e.g., memory)
- Differential diagnosis
- Localization
- Baseline
- Assessment of change
- Competency evaluation
- Recommendations (e.g., placement, accommodations)

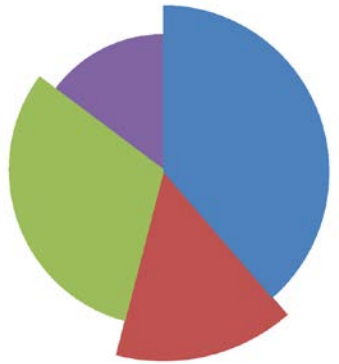
Potential referral questions within the SMI realm

- Older adult with history of chronic schizophrenia having more trouble with ADLs
  - Psychiatric factors or dementia?
- Older adult with no psychiatric history presents with new-onset psychosis
  - Psychiatric factors or dementia?
  - Other considerations?
- Adult with chronic SMI sustains a cerebral infarct/TBI/anoxic injury
  - Thought disorganization or aphasia?
- Young adult with new-onset psychosis has trouble with language comprehension
- Young adult post first-episode of schizophrenia is interested in returning to school

But it’s never that simple

- Adult with schizoaffective disorder exhibits short-term memory loss after years of chronic substance use (alcohol, opiates, tobacco). He has not been taking psychotropic medication because he is homeless and missed his last outpatient appointment. He is depressed about the current state of his life and expresses suicidal ideation. He is estranged from his family and his girlfriend recently died via overdose. He has poorly-controlled hypertension and diabetes.

(Some) Possible contributors



- Psychosocial stressors – can be chronic
  - Homelessness, social isolation, reduced support, fixed income
- Trauma history
- Substance use
  - Tobacco use comorbid in vast majority of those with psychosis
- Burden of chronic illness
- Medical comorbidities
- Possible early discontinuation of formal education
  - How much attributable to cognition, psychosis
- Cognitive burden of long-term antipsychotic use, other psychotropic meds
  - Evidence for reduced cortical volume, enlarged ventricles, white matter changes

Case example

- 29 y/o right-handed male with 12 years of education
- Five previous inpatient hospitalizations, diagnosis of schizophrenia
- Presentation on admission:
  - disorganized thoughts and speech, mild delusional beliefs, and poor insight
  - difficulties with aspects of cognitive functioning
- Reason for NP referral:
  - Thought processes have improved with medication
  - Continues to exhibit disorganized speech (especially in response to loose or unstructured communication) and a lack of insight

Case example

- Reported symptoms:
  - Largely denied current cognitive symptoms, though he described possible language difficulties in terms of “trying to dialogue a speech protagonist,” noting, “I’m hesitant to use English when I’m jumbled in my mind.”
  - Attributed to “lack of oxygen to different regions of the brain” caused by medication side effects
  - Sensory, motor symptoms denied
  - Independent in ADLs when living in the community
    - Holding a job
    - Living with parents, paying rent

Case example

- Medical history: largely unremarkable; taking antipsychotic and antianxiety medication while inpatient
- Sleep: highly variable (30m to 8h per night)
- Substance use: daily tobacco and cannabis; “dipped and dabbled” in numerous substances, but no use for past 5 years
- Developmental: no problems with gestation, birth, or development. No learning problems but had speech therapy in childhood. Graduated from high school, attempted junior college but discontinued after six months of failed classes
- Behavioral observations: highly disorganized thought processes, difficult to follow during unstructured conversation or in response to complex or abstract test items. Flat affect. Otherwise unremarkable.

Cognitive profile

- Intellectual functioning: average to high average. FSIQ = 98
- Learning and memory:
  - extremely low verbal learning, borderline/low average verbal memory
  - Average visual learning and memory
- Attention/processing speed: low average to high average
- Executive functions: average to superior, except for novel problem solving
- Language: low average to average expressive, but extremely low comprehension
- Visuospatial: average

Conclusions

- Disorganized speech and lack of insight likely attributable to schizophrenia, rather than a neurocognitive disorder
  - Verbal learning and memory deficits are common
- Expressive language WNL with structure (i.e., not aphasic)

Recommendations

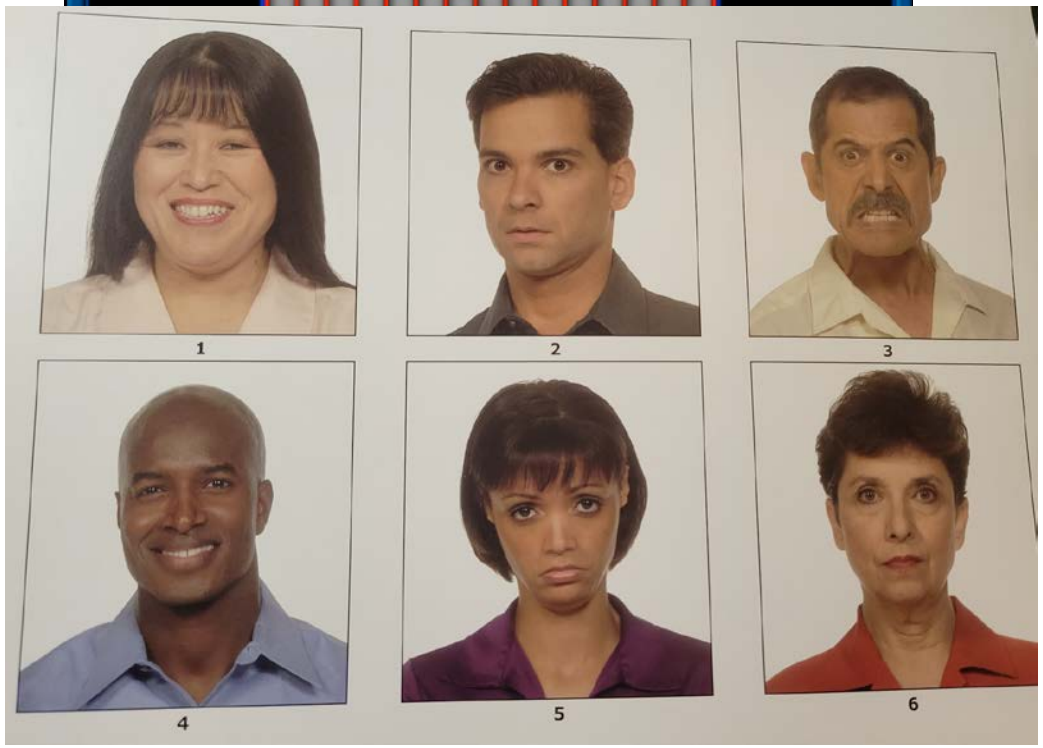
- Continued involvement in psychiatry treatment
- Abstain from substance use
- Improve sleep hygiene
- Use visual aids when learning
- For providers and family: increase structure when needing a verbal response
  - Yes/no, provide response options, have him paraphrase information
  - Provide important information in written format for comprehension and reference

Intervention – Cognitive Remediation

- Research has demonstrated benefit for cognitive remediation training in schizophrenia
  - Improvement in global cognition and overall functioning
  - Adopted in clinical practice guidelines for schizophrenia

Intervention – Cognitive Remediation

- Computer based cognitive remediation
- Social cognition training
  - Mentalizing, detection of sarcasm, emotion recognition
- Metacognitive training
- Compensatory strategy training



Intervention – Cognitive Remediation

- Four critical treatment characteristics
  - Active and trained therapist
  - Repeated practice of cognitive exercise
  - Structured development of cognitive strategies
  - Integration with psychosocial rehabilitation

Thank you!

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