

Experimental Psychopathology

Lecture 39

The Symptoms Are *Not* the Disease

- Vocabulary of the Medical Model
 - Symptoms
 - Superficial Manifestations of Underlying Pathology
 - Syndromes
 - Clusters of Symptoms that Tend to Co-Occur
 - Disease
 - Syndrome Whose Underlying Pathology is Known
- Underlying Pathology
 - Revealed by Laboratory Research

Scientific Medicine

Treats Pathology, Not Symptoms

Beyond Symptoms to Underlying Pathology

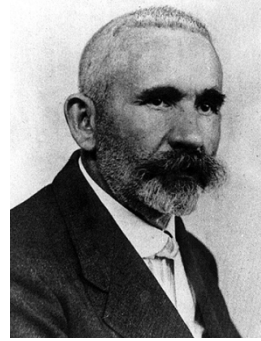
Medicine

- Anatomical Lesions
- Physiological Malfunction
- Infection
 - Virus, Bacteria, Fungi

Psychopathology

- Psychological Deficits
 - Mental Structures
 - Mental Processes
 - Neural Substrates?
- Maladaptive Mental Contents
 - Thoughts, Beliefs, Expectations
 - Feelings, Desires
 - Product of Social Learning

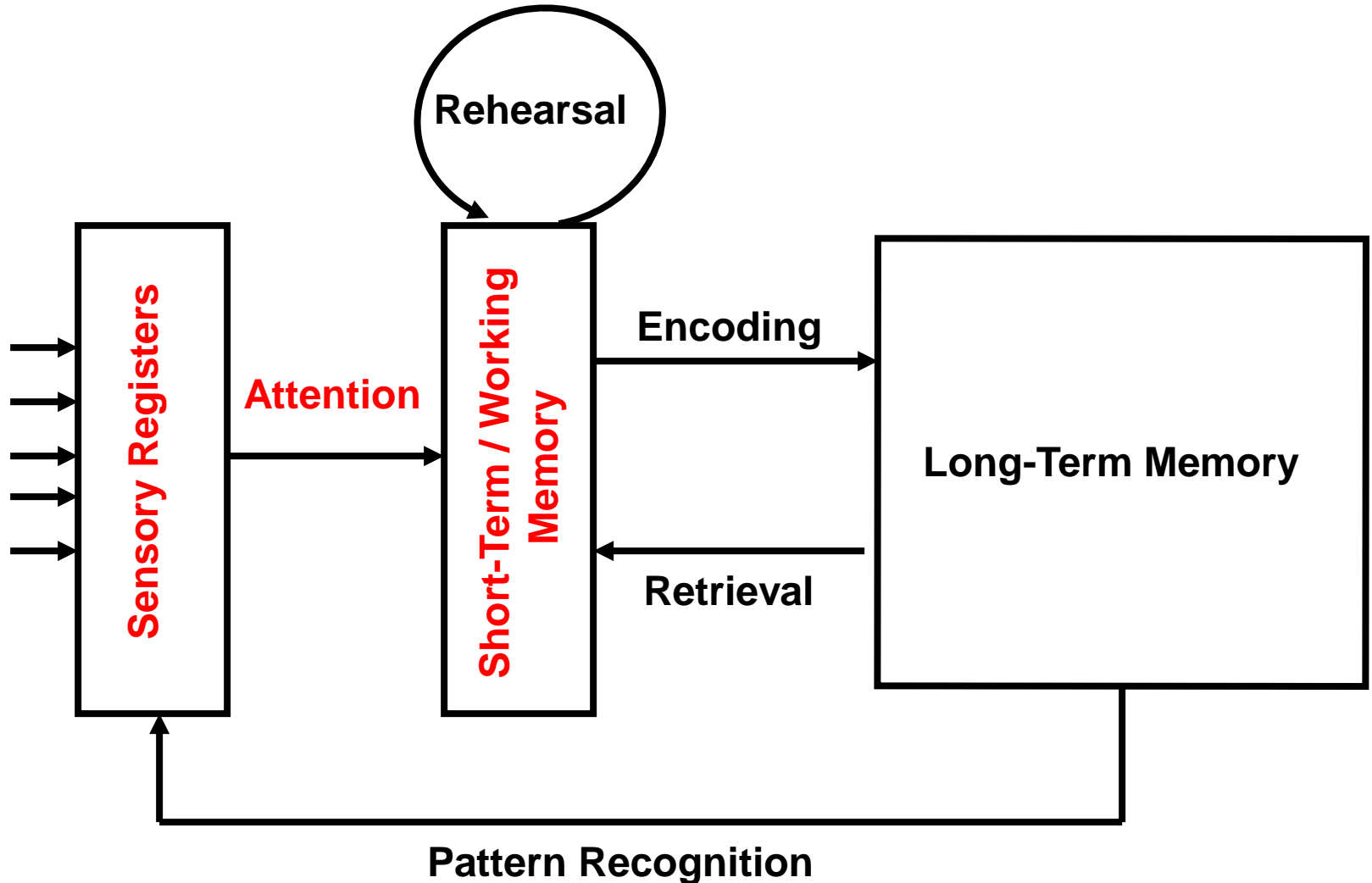
Laboratory Studies of Psychological Deficit



- Emil Kraepelin in Wundt's Laboratory
 - Donders's Reaction-Time Technique
- Attentional Deficit in Schizophrenia
 - Breakdown in Selective Attention
 - Distractibility
 - Inability to Filter Out Irrelevant Ideas
 - Consequences
 - Language Disorder
 - Social Withdrawal

The Multi-Store Model of Memory

After Waugh & Norman (1965); Atkinson & Shiffrin (1968)

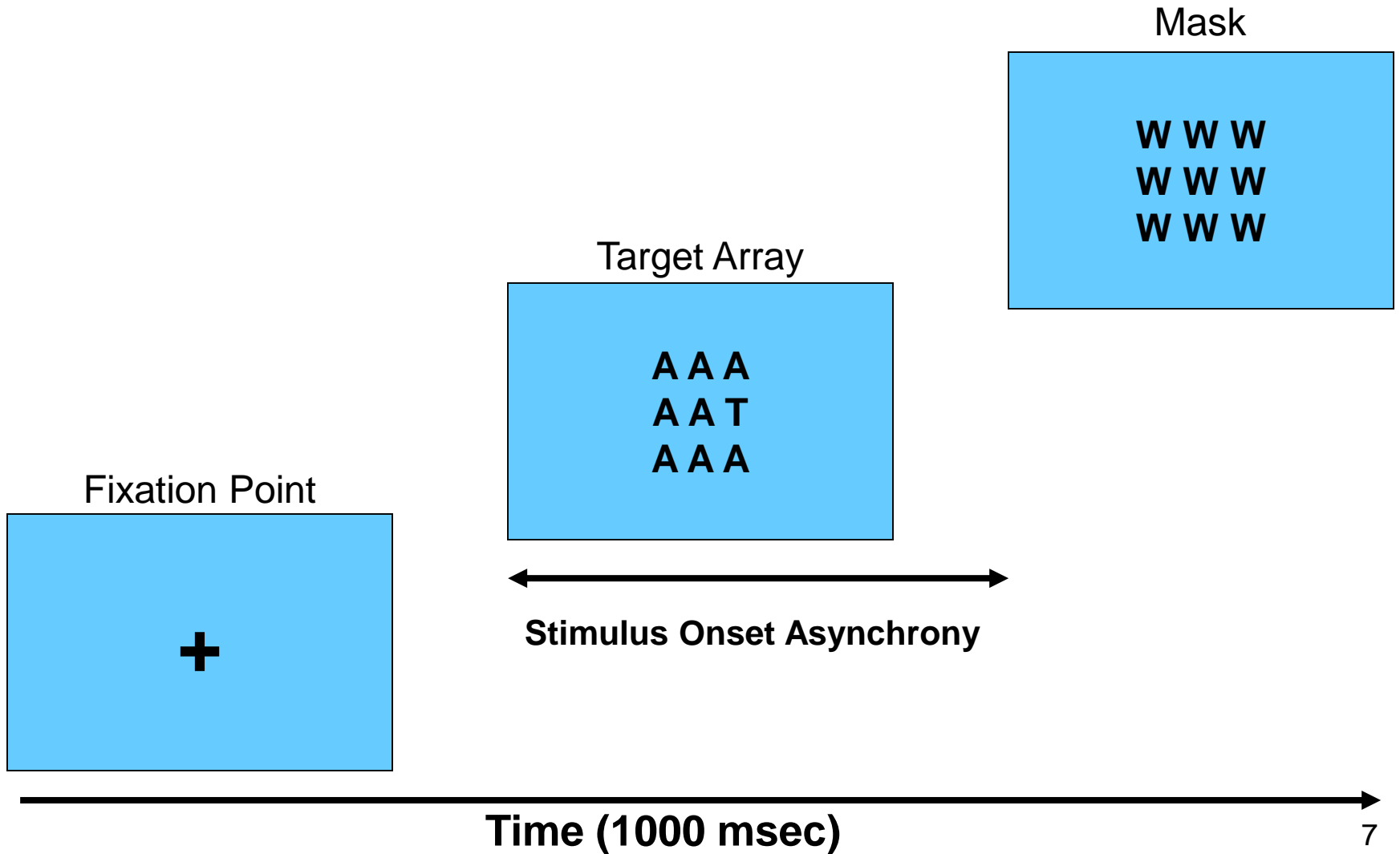


Iconic Memory in Schizophrenia

- Iconic Memory
 - Very-Short-Term Sensory Store
 - Prelude to Storage in Short-Term or Working Memory
 - Available for Further Processing
- Sperling Paradigm
 - Decays < 1 Second
 - Displacement $\ll 1$ Second
- Mask Displaces Iconic Trace
 - Stimulus Onset Asynchrony
 - Between Onset of Target and Onset of Mask

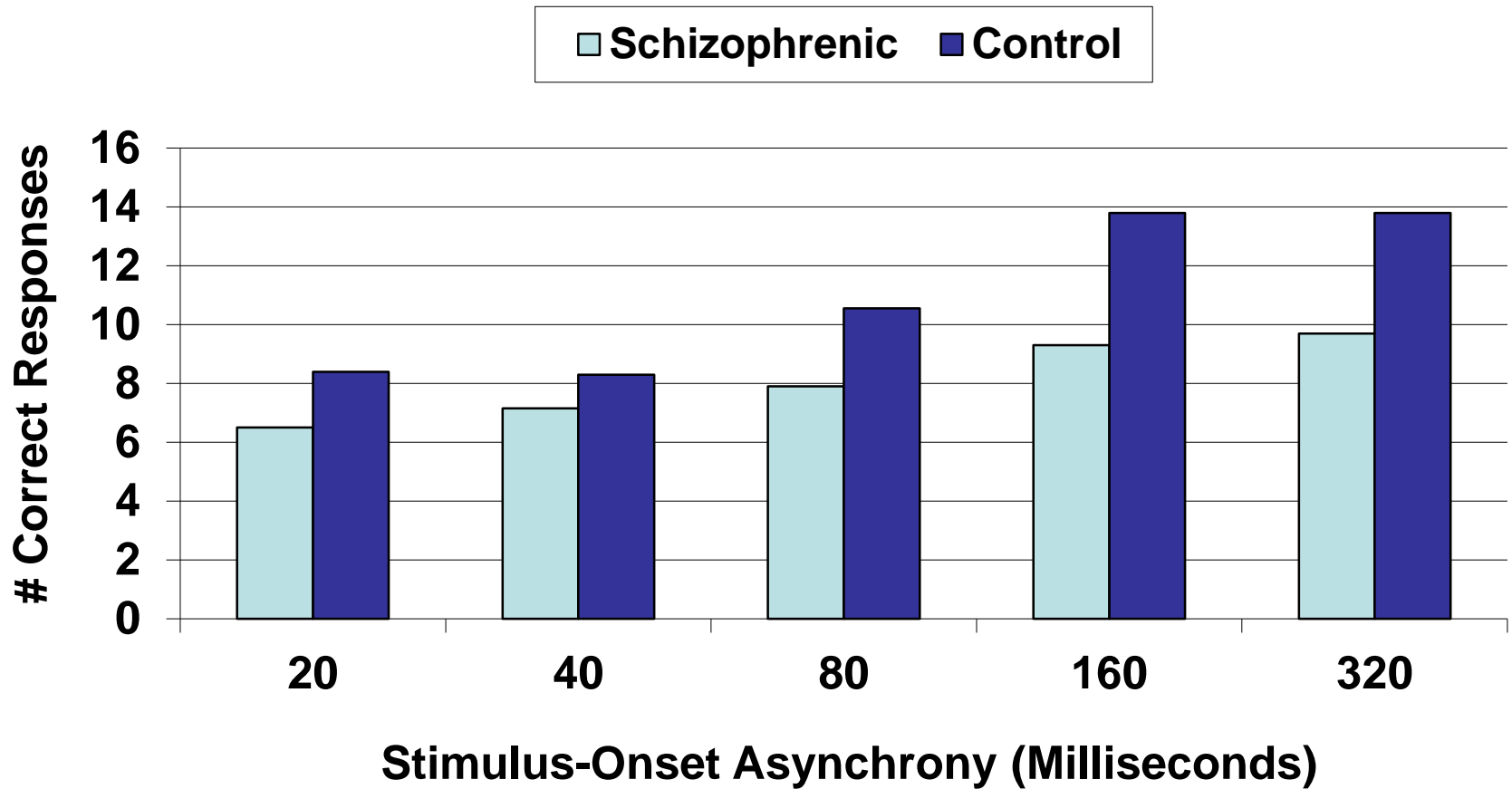
Backward Masking

Is there a "T"?



Retrieval from Iconic Memory

Saccuzzo & Schubert (1981)





Working Memory in Schizophrenia

Goldman-Rakic (1994); Barch (2003)

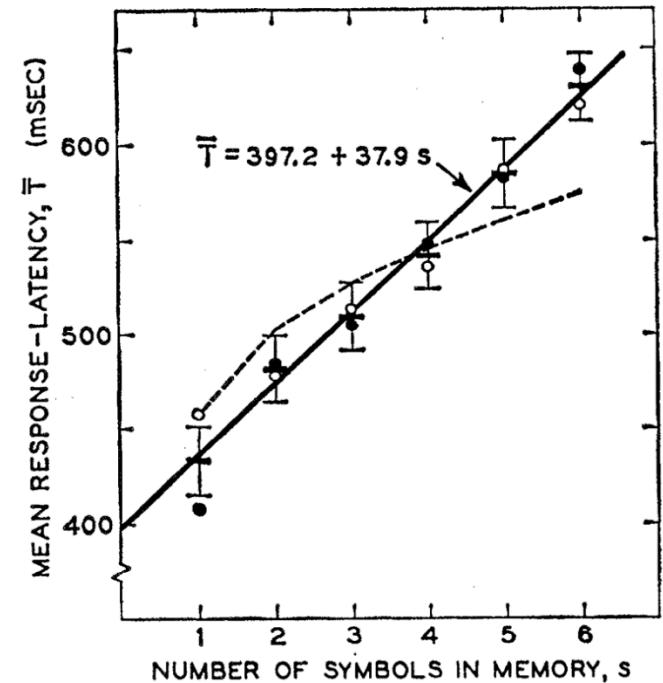


- Maintains Information in an Active State
 - Permits Further Information Processing
 - Critical for Selective Attention
 - Focusing on Task-Relevant Information
 - Inhibition of Task-Irrelevant Information
- Critical for “Higher” Cognitive Functions
 - Memory Encoding and Retrieval
 - Reasoning and Problem-solving
 - Language

Working Memory in Schizophrenia

Metzak et al. (2012)

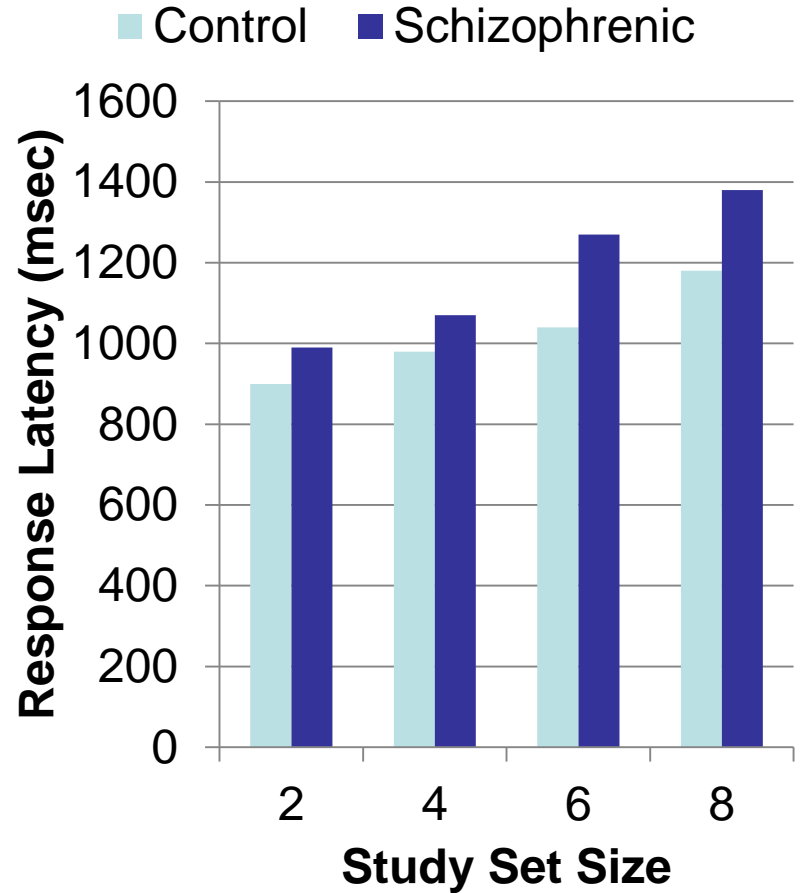
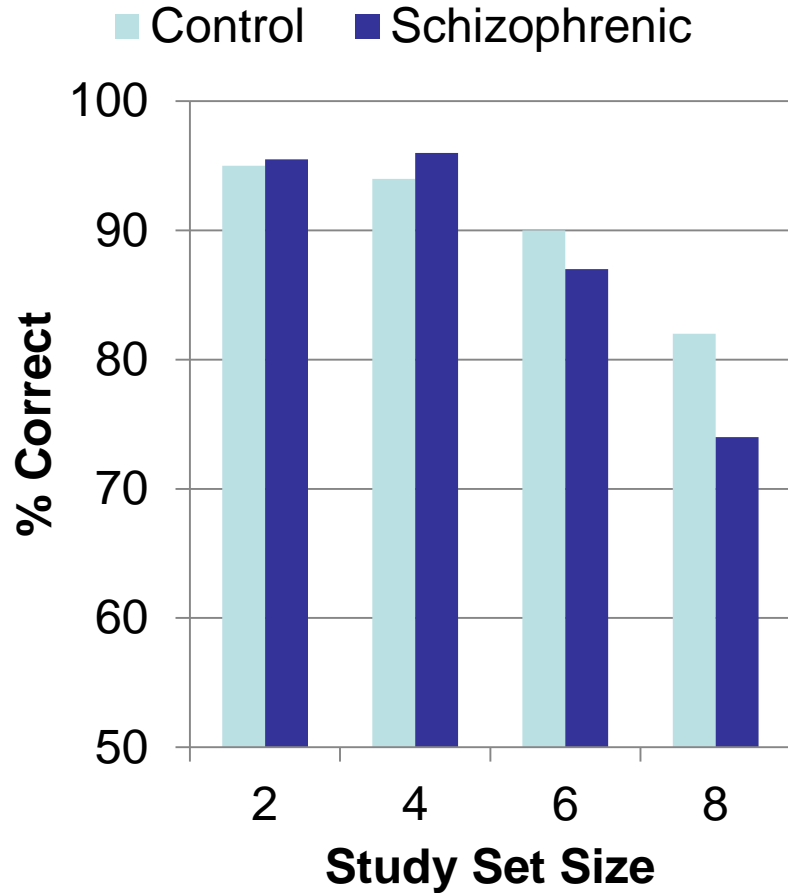
- Sternberg Paradigm
 - Memorize Study Set
 - Varies from 2-8 Letters
 - Find Target
 - Accuracy, Response Latency



- Schizophrenics vs. Normals
 - Matched for Demographic Variables
 - Patients Taking Medication

Working Memory in Schizophrenia

Metzack et al. (2012)





Working Memory in Schizophrenia

Goldman-Rakic (1994); Barch (2003)



- **Components**

- **Modality-Specific Buffers**

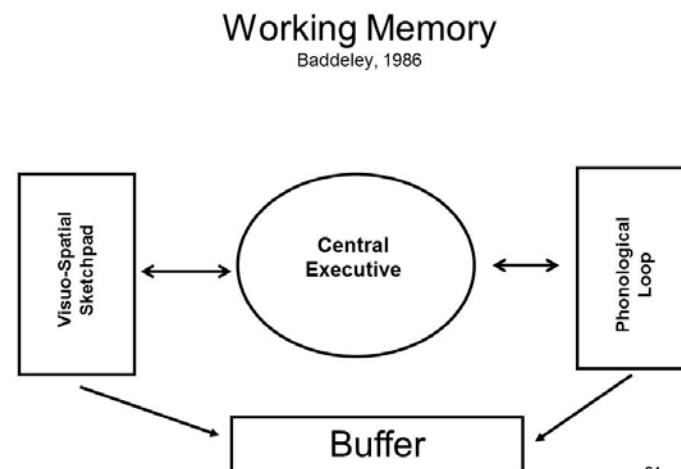
- Support Rehearsal
 - Hold Information in Active State
- Inferior/Posterior Prefrontal Cortex

- **Central Executive**

- Guides Information-Processing
 - Manipulation/Transformation of Information
- Dorsolateral Prefrontal Cortex
 - Supported by Dopamine System?

- **Represent, Maintain Contextual Information**

- Relevant to Current Tasks



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Eye-Tracking and Attention

Holzman et al. (1981)



- Follow swinging pendulum with eyes
 - Smooth Pursuit Eye Movements
- Eye-Tracking Dysfunctions
 - Interruptions of SPEMs
 - Saccadic Tracking
 - Saccadic Intrusions
- Eye-Tracking and Attention
 - Peripheral, Psychophysiological Index

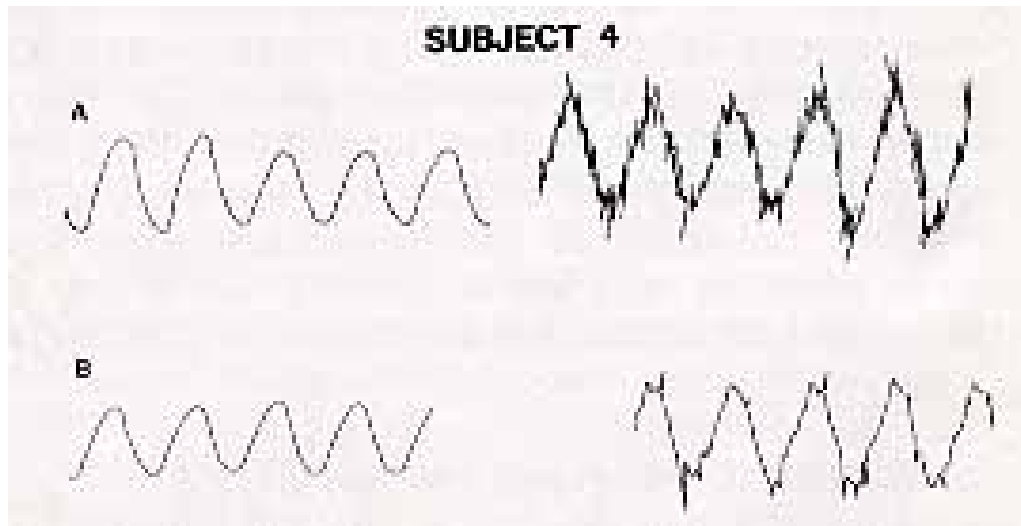
Smooth Pursuit Eye Movements

Holzman et al. (1981)

Normal Subject

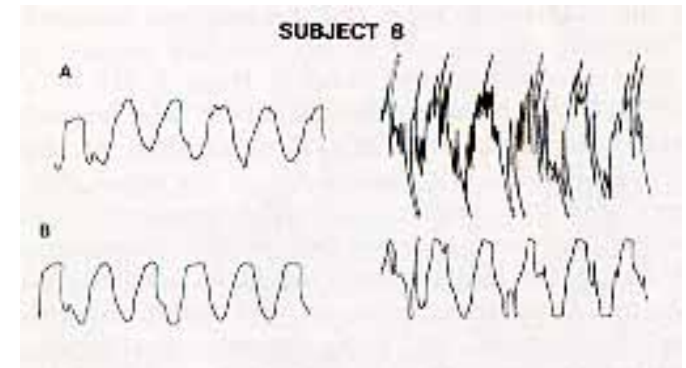
Direct

Derivative



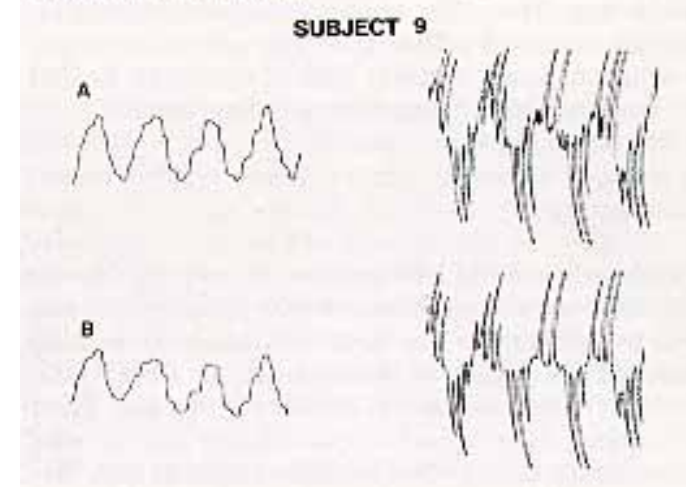
A = Standard EOG; B = Infrared Reflection

Schizophrenics



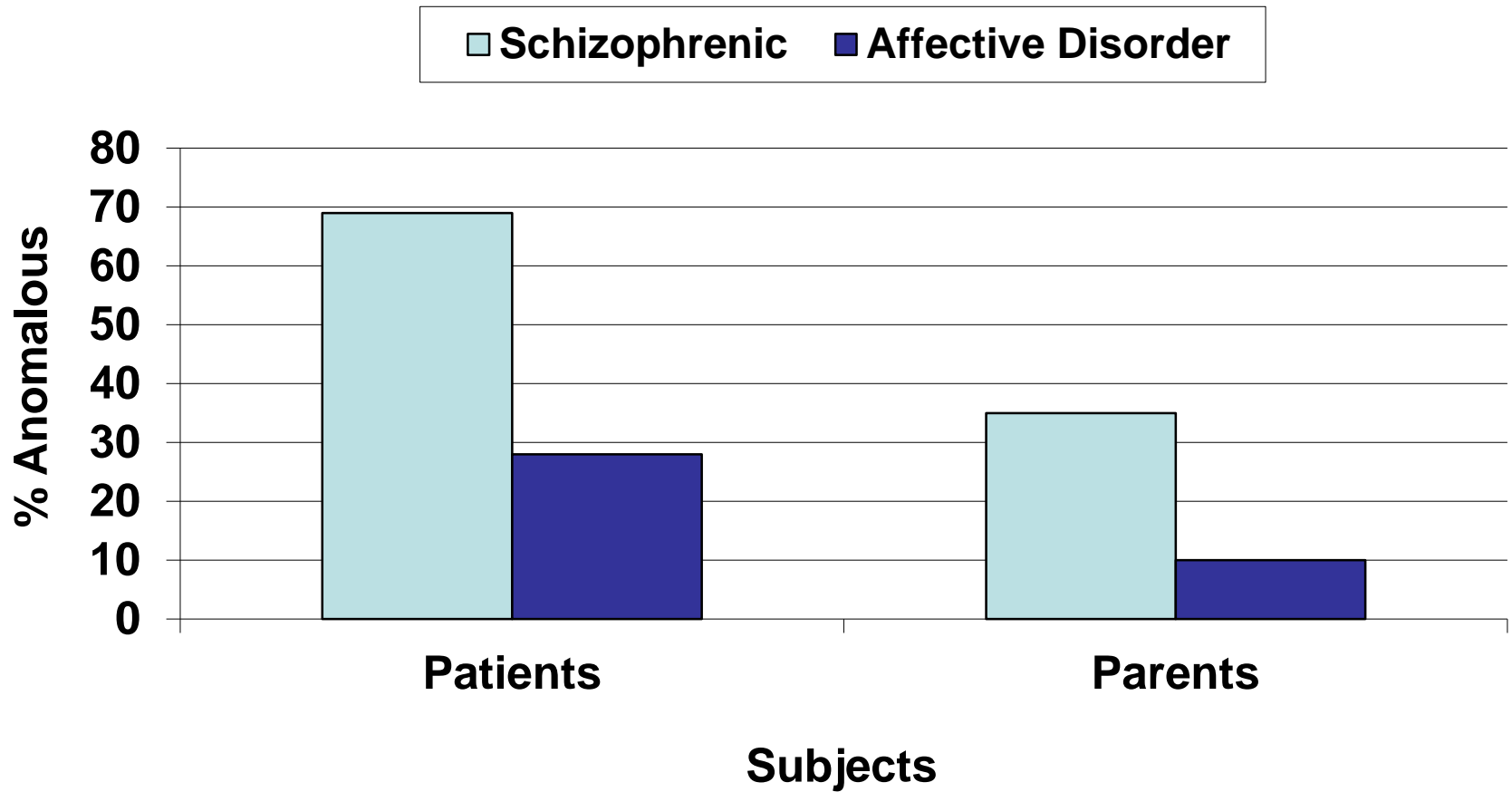
DIRECT EYE MOVEMENT

DERIVATIVE



Eye-Tracking in Psychosis

Holzman et al. (1981)





Components of Emotion in Schizophrenia

Kring & Neale (1998)

- Anhedonia
 - Flat/Blunted Affect
 - Inappropriate Affect
- Emotional Films
 - Positive, Negative, Neutral
- Components of Emotion
 - Subjective: Self-Rating
 - Overt Behavior: Facial Expressions
 - Covert Physiological: Skin Conductance

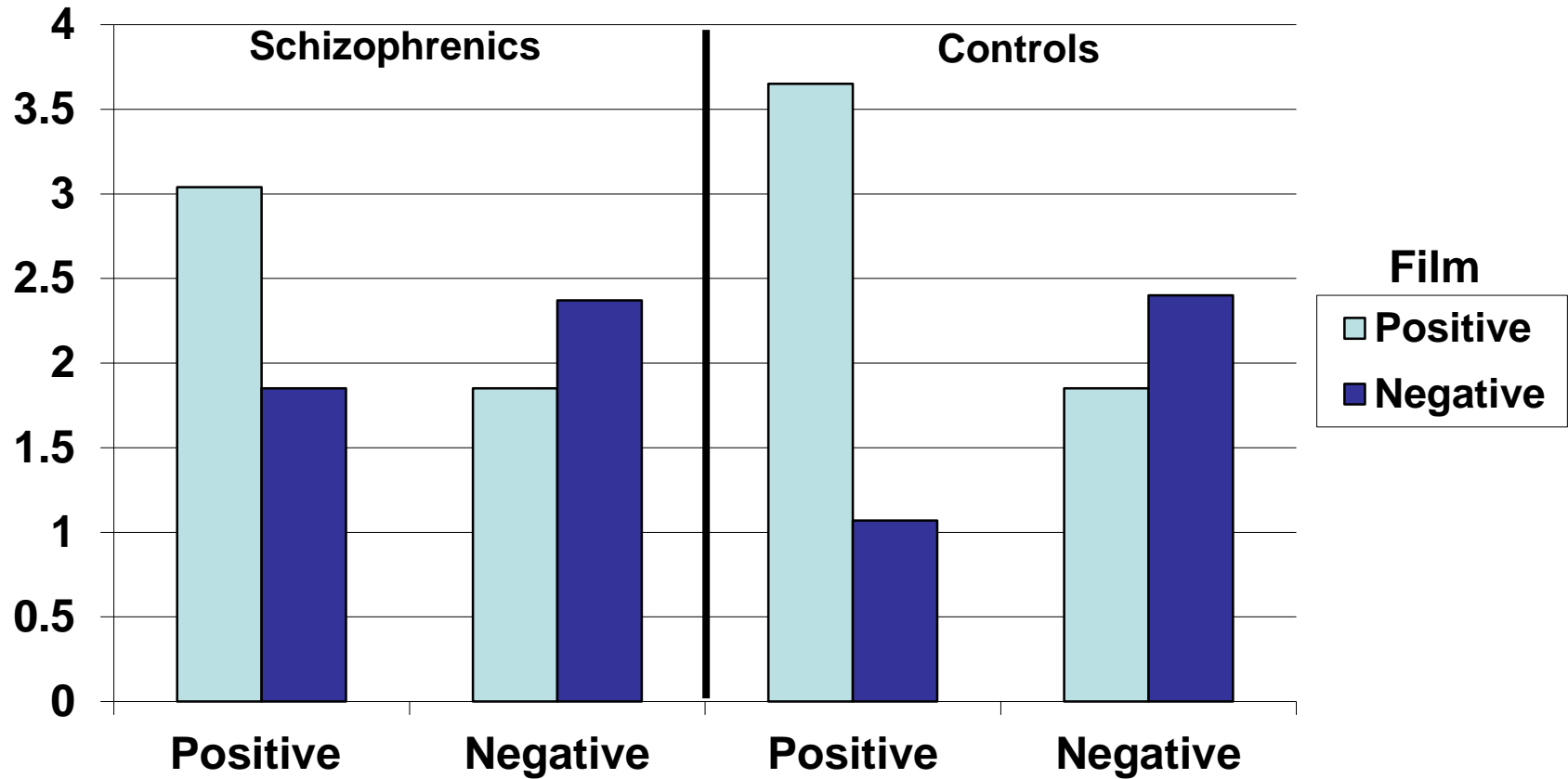
Facial Expressions of Emotion

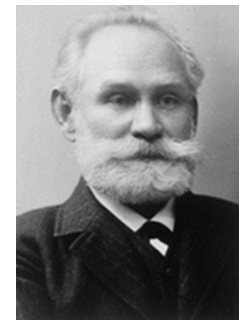
Kring & Neale (1998)

	<u>Schizophrenics</u>	<u>Controls</u>
Facial Expression		
Frequency	1.30	4.90
Intensity	0.50	0.92
Duration	5.65	27.74
Skin Conductance		
Reactivity	2.27	0.32

Self Reports of Emotional Experience

Kring & Neale (1998)





Experimental Neurosis in Animals

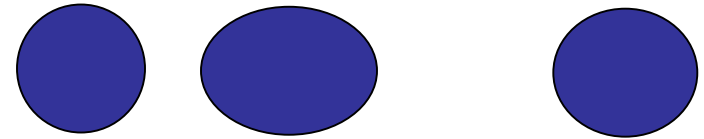
Shenger-Kristovnikova (c. 1927); Pavlov (1941); Gantt (1944)
Mineka & Kihlstrom (1978)



- Discrimination Learning

- Salivary Conditioning

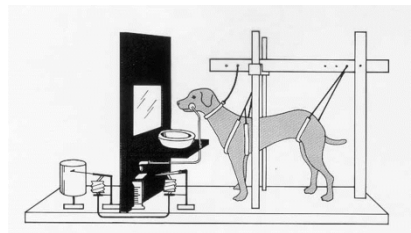
- CS+ (Circle/Ellipse)
 - CS- (Ellipse/Circle)



- Test Stimulus: 9:8 Ratio

- Response to Difficult Discrimination

- Agitation
 - Loss of Discriminative CR
 - Impaired Savings in Relearning



Conditioning Models of Phobias, Obsessions, and Compulsions

Wolpe (1952, 1958)

- Phobias as Conditioned Fear Responses
 - Observational Learning vs. Direct Experience
 - Preparedness
- Obsessions as Generalized Fear Responses
 - Similar Behavior During Conditioning Experience
- Compulsions as Avoidance Behaviors
 - Reduce Conditioned Fear
 - Resistance to Extinction



Laboratory Models as Theories of Psychopathology

Maser & Seligman (1977)

- **Symptoms**
 - Phobia as Conditioned Fear
- **Causes**
 - But Often No Conditioning Experience!
 - Observational/Vicarious Learning
- **Cures**
 - Systematic Desensitization as Extinction
- **Prevention**
 - Prevent Fearful Encounter/Social Learning
- **Biological Substrates**
 - Heart-Rate Acceleration as a Measure of Fear Response

Parallels Between Learned Helplessness and Depression

Seligman (1975)

- Symptoms
 - Passivity, Negative Expectations
 - Lack of Aggression
 - Loss of Appetite, Sexual Interest
- Life history
- Treatment
 - Change Expectations
 - Antidepressant Drugs
- Prevention
 - Mastery Experiences
- Biological Substrates
 - Norepinephrine Depletion





Revising the Helplessness Theory of Depression



Abramson, Seligman, & Teasdale (1978); Abramson, Metalsky & Alloy (1989)

- Exposure to Uncontrollable Aversive Events
 - But Often Angry, Not Depressed
- Dimensions of Causal Attribution
 - **Internal** vs. External
 - **Stable** vs. Variable
 - **Global** vs. Specific



Hopelessness Theory of Depression



Abramson, Seligman, & Teasdale (1978); Abramson, Metalsky & Alloy (1989)

- Depression as Hopelessness
 - Uncontrollable Aversive Events
 - “Depressogenic” Causal Attributions
 - Internal, Stable, Global
- “Illusion of Control”
 - Depressive Realism
- “Hopelessness” Subtype of Depression
 - Attributional Style as Risk Factor
 - Other Subtypes Have Other Causes

Dopamine Hypothesis of Schizophrenia

- Excess Activity of Dopamine
 - Neurotransmitter
 - Active in Dorso-Lateral Prefrontal Cortex
 - Causes Attentional Deficit, Symptoms
- Phenothiazine Treatment of Schizophrenia
 - Blocks Neural Receptors for Dopamine
 - Impairs Uptake by Post-Synaptic Neurons
- Post-Mortem Data, Brain-Imaging
 - Increased Brain Dopamine?
 - Increased Dopamine Receptors?

Amphetamine Psychosis

A Laboratory Model of Schizophrenia?

Snyder (1972, 1976)

- Amphetamines
 - Benzedrine (Amphetamine)
 - Dexedrine (Dextroamphetamine)
 - Methedrine (Methamphetamine)
- Amphetamine Psychosis
 - Habitual, Heavy Use
 - Hallucinations
 - Thought Disorder
 - Paranoid Symptoms

Psychopathy:

Linking Laboratory Models to Psychological Deficits

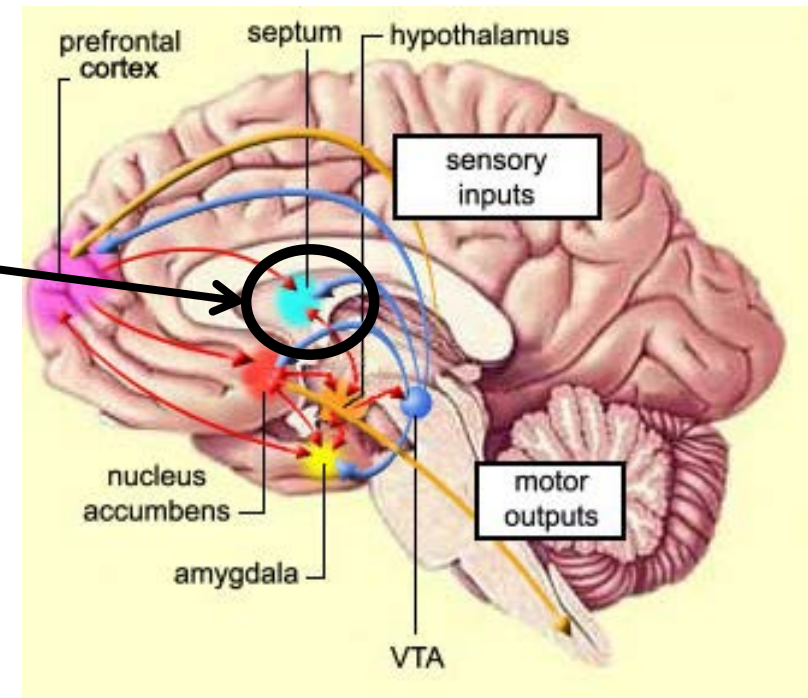
Gorenstein & Newman (1980)

- **Response to Aversive Stimulation**

- Failure of Avoidance Learning
- No Response to Punishment

- **Septal Lesions in Rats**

- Freezing When Punished
- Passive Avoidance
- Delay of Gratification



Failure to Suppress Habitual Responses in Order to Avoid Aversive Consequences

Hypnosis and “Hysteria”

Kihlstrom (1979)

- Suggested Alterations in Consciousness
 - Perception
 - Hypnotic Blindness, Deafness, Analgesia
 - Parallel Symptoms of Conversion Disorders
 - Memory
 - Posthypnotic Amnesia
 - Parallels Symptoms of Dissociative Disorders
- Dissociations in Hypnosis and “Hysteria”
 - Explicit and Implicit Perception, Memory
 - Parallel Findings in Dissociative, Conversion Disorders

Connecting the Clinic to the Lab

Maier (1966); Kihlstrom & McGlynn (1991)

- **Beyond Symptoms to Pathology**
 - Underlying Causes
 - Correlated Biological Processes
- **New Ways of Formulating Theory**
 - Working Laboratory Simulations
- **New Diagnostic Tools**
 - Laboratory Tests, Not Symptom Checklists