Senior Comprehensive Exam AU 2026

Study Guide

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Abnormal Psychology

Study Guide

Anxiety vs. Fear

- Anxiety: apprehension over an **anticipated problem** (*future threat*)
- Fear: reaction to **immediate danger** (*current threat*)
- Both:
    - Involve sympathetic nervous system activation
    - Can be adaptive
        - "Fight, Flight or Freeze" response
        - Tend and befriend
        - Helps in planning for the future

Anxiety is not a bad thing!

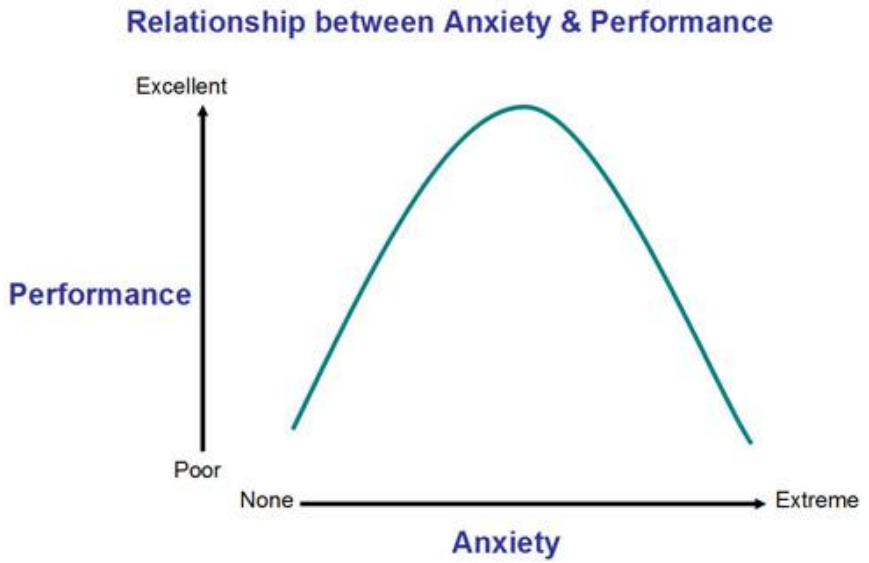
Examples:

Test-taking

Giving a presentation

Escaping from a dangerous situation

Taking medication properly



DSM-5 Anxiety Disorders

- Specific phobias
- Social anxiety disorder
- Panic disorder
- Agoraphobia
- Generalized anxiety disorder

How common are Anxiety Disorders?

- Most common psychiatric disorders
- 28% of US population reports anxiety symptoms (Kessler et al., 2005)
- Phobias most common
- Very costly to the *individual* and to *society*

Specific Phobias

- Disruptive fear of a particular object or situation
  - Fear out of proportion to actual threat
  - Awareness that fear is excessive or unreasonable
  - Goes to great lengths to avoid object/situation
  - Must be severe enough to cause *distress* or interfere with job or social life (*disability*)

Specific Phobias

"Jan is a 42-year-old woman who was offered a high-paying in Florida. She was considering turning the position down because it would force her to live in an area known for having snakes. Jan reports a litany of ways in which she avoids snakes. She steers clear of outdoor activities, TV programs on nature, and even her children's books on nature. Although she had been able to cope with her fears without too many negative consequences before, the idea of living in an area with snakes greatly increased her apprehension."

Specific Phobia

- Examples:
  - Claustrophobia = Fear of closed spaces
  - Acrophobia = Fear of heights
  - Chorophobia = Fear of dancing
  - Alliumphobia = Fear of garlic
  - Arachibutyrophobia = Fear of peanut butter sticking to the roof of your mouth
- Typically fears cluster around certain themes
  - **Animals** (snakes, insects, sea creatures)
  - **Natural environment** (storms, heights, water)
  - **Blood/Injection/Injury** (getting a shot)
  - **Situational** (bridges, tunnels)

DSM-5 Criteria for Specific Phobia

1. Marked and disproportionate fear consistently triggered by specific objects or situations
2. The object or situation is avoided or else endured with intense anxiety
3. Symptoms persist for at least 6 months

Specific Phobia Facts

- Age of onset varies by feared stimulus
  - Animals → **childhood**
  - Natural environment → **childhood**
  - Situational → **childhood to mid-twenties**

- Tends to persist without treatment, but with treatment prognosis is good

- High comorbidity among specific phobias!

Social Anxiety Disorder

- Referred to as Social Phobia in DSM-IV-TR

- Characterized by:
  - Persistent and intense fear of social situations
  - Driven by a fear of negative evaluation or scrutiny
  - Exposure to trigger leads to anxiety about being humiliated or embarrassed socially
  - Results in significant avoidance of feared situations

- Onset often adolescence
- More pervasive and severe than shyness
- Video

DSM-5 Criteria for Social Anxiety Disorder

1. Marked and disproportionate fear consistently triggered by exposure to potential social scrutiny
2. Exposure to the trigger leads to intense anxiety about being evaluated negatively
3. Trigger situations are avoided or else endured with intense anxiety
4. Symptoms persist for at least 6 months

Note:

The DSM-IV-TR, but not the DSM-5, specifies that the person recognizes the fear is unrealistic

DSM-IV-TR includes the duration criterion only for those under age 18

Panic Disorder

- Frequent, uncued panic attacks + worry about having more panic attacks OR changes in behavior

- Panic Attack: Sudden, intense episode of apprehension, terror, feelings of impending doom
  - Physiological symptoms
  - Depersonalization
  - Derealization
  - Fear of losing control, going crazy, dying
  - Rapid onset (peak within 10 minutes)
  - Very common → 25% lifetime rate

DSM-5 Criteria for Panic Disorder

- ***Recurrent, uncued*** panic attacks
  - Cued attacks triggered by specific situations
  - Uncued attacks occur unexpectedly

- At least 1 month of:
  - Concern about the possibility of more attacks
  - Worry about the consequences of an attack
  - Behavioral changes because of the attacks

Agoraphobia

- Anxiety about inability to flee anxiety- provoking situations
  - Ex: Crowds, stores, malls, churches, trains, bridges, tunnels, etc.
  - Causes significant impairment

DSM-5 Criteria for Agoraphobia

- Marked and disproportionate fear or anxiety about at least 2 situations where it would be difficult to escape or receive help in the event of incapacitation or panic-like symptoms
- These situations consistently provoke fear or anxiety
- These situations are avoided, require the presence of a companion, or are endured with intense fear or anxiety
- Symptoms last at least 6 months

Generalized Anxiety Disorder (GAD)

- What is the key feature = **Worry**
- What is worry?
  - Cognitive tendency to chew on a problem and be unable to let it go
  - Everyone worries! = GAD
  - In GAD worry is chronic, excessive or unreasonable

+ other symptoms = GAD

- Other symptoms:
  - Physical symptoms (Ex: restlessness, irritability, muscle tension)
  - Procrastination in decision-making, reassurance seeking, avoiding situations with potential negative outcomes

- Often begins in adolescence, but people often report being "worriers" all their lives

DSM-5 Criteria for Generalized Anxiety Disorder

1. Excessive anxiety and worry at least 50% of time about at least two life domains (e.g., family, health, finances, work, and school)
2. The worry is sustained for at least 6 months
3. The anxiety and worry are associated with at least three of the following:
   - Restlessness/feeling keyed up or on edge
   - Being easily fatigued
   - Difficulty concentrating or mind going blank
   - Irritability
   - Muscle tension
   - Sleep disturbance

DSM-5 Criteria for Generalized Anxiety Disorder

- Anxiety and worry associated with:
  - Avoidance of situations in which negative outcomes may occur
  - Marked time and effort preparing for situations that might have a negative outcome
  - Marked procrastination, difficulty making decisions due to worries, or repeatedly seeking reassurance due to worries

Comorbidity

- More than half of people with 1 anxiety disorder meet criteria for a 2nd disorder
  - GAD: 80% meet criteria for another anxiety disorder
- Why?
  - Symptom overlap
  - Etiological factors increase risk for anxiety disorders *as a group*
- 75% of individuals with an anxiety disorder meet the criteria for another disorder
  - 60% meet criteria for major depression
  - Substance abuse, personality disorders, medical conditions also common

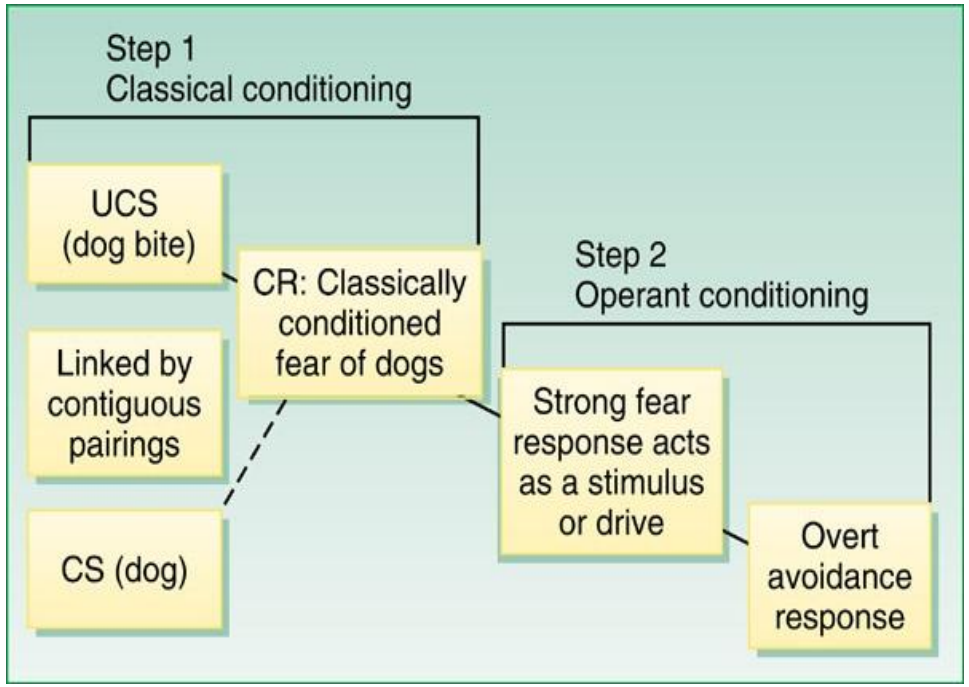
Gender Factors

- Women are 2x as likely as men to have an anxiety disorder
- Possible explanations?
  - Women more likely to report symptoms
  - Men more likely to be encouraged to face fears
  - Women more likely to experience life stressors (e.g., childhood sexual abuse)
  - Women show more biological stress reactivity

Cultural Factors

- Culture influences what people come to fear:
  - *Taijin kyofusho (Japan):* Fear of offending or embarrassing others
  - *Kayak-angst (Inuit)*: Intense fear, disorientation, and concerns with drowning seen in seal hunters
  - *Susto (Latin America)*: "Fright illness," belief that a strong fright can cause the soul to leave the body
- Prevalence of disorders varies across cultures
  - Lowest prevalence in Japan and Taiwan
    - May reflect mental health stigma

Mowrer's Two-Factor Model



- Fear Conditioning
  - STEP 1: Pairing of stimulus with aversive UCS leads to fear (*Classical Conditioning*)
  - STEP 2: Avoidance maintained though negative reinforcement (*Operant Conditioning*)

Mowrer's Two-Factor Model

- Can we come up with an example for a specific phobia of clowns?

Summary:

1) Fear association learned through classical conditioning
2) Avoidance is negatively reinforced (operant conditioning)
   - **Avoidance** prevents **extinction**

Extensions to the Two-Factor Model

- How does classical conditioning occur?
  - Direct contact with the feared stimulus
  - Modeling
    - Seeing another person harmed by the stimulus
  - Verbal instruction
    - Parent warning a child about danger

Genetic and Neurobiological Risk Factors

- Heritability
  - 20-40% for specific phobias, SAD, and GAD
  - 50% for PTSD
- Brain functioning
  - Fear circuit = amygdala, hippocampus, and the medial prefrontal cortex
  - Elevated fear circuit activity linked with anxiety
- Neurotransmitters
  - Poor functioning of serotonin and GABA
  - Higher levels of norepinephrine

Personality Risk Factors

- Behavioral inhibition
  - Tendency to be agitated, distressed, and to cry in unfamiliar or novel settings
    - Observed in infants as young as 4 months
    - May be inherited
  - Predicts anxiety in childhood and social anxiety in adolescence

- Neuroticism
  - As with depression, neuroticism predicts onset of anxiety disorders (2x as likely)

Cognitive Risk Factors

- Sustained negative beliefs about future
  - Bad things are likely to happen!
  - Leads to safety behaviors
  - Safety behaviors prevent **extinction**!

Cognitive Risk Factors

- Belief that one lacks control over environment
  - More vulnerable to developing anxiety disorder
    - Childhood trauma or punitive parenting may foster beliefs
    - Serious life events can threaten sense of control
- Attention to threat
  - Tendency to notice negative environmental cues
    - Selective attention to signs of threat
    - Examples: Stroop task, dot probe task

Etiology of Specific Phobias

- Two-factor model of behavioral conditioning
- Risk factors act as diatheses
  - Vulnerabilities influence development of phobias
- “Prepared learning”
  - Evolutionary preparation to fear certain stimuli
    - Potentially life-threatening (heights, snakes, etc.)

Etiology of Social Anxiety Disorder

- Two factor model
  - Unique safety behaviors
    - *Avoiding eye contact, disengaging from conversation, standing far away from others*
    - Can elicit unwanted responses from others
- Cognitive factors
  - Unrealistic negative beliefs about consequences of behavior
  - Unfairly harsh self-evaluations
  - Excessive attention to internal cues

Etiology of Panic Disorder

- Neurobiological factors
  - Locus ceruleus = major source of norepinephrine
    - A trigger for nervous system activity
  - Drugs that increase activity of locus ceruleus **trigger panic attacks**, while drugs that decrease activity in this area can **decrease the risk of panic attacks**

Etiology of Panic Disorder

- Behavioral factors
  - Interoceptive conditioning
    - Panic attacks often triggered by **internal bodily sensations**,
    - May occur in situations that induce anxiety (*public speaking*) or arousal (*exercise*)
- Cognitive facotors
  - Catastrophic interpretations of bodily symptoms
    - Interpreted as a sign of impending doom
    - “I must be having a heart attack!”
  - Beliefs increase anxiety and physiological arousal

Etiology of Agoraphobia

- We know relatively little because research has traditionally looked at agoraphobia in the context of panic disorder
- Fear-of-fear hypothesis
  - Negative thoughts about the consequences of *having panic attacks in public*
  - Spend time worrying about public places where panic attacks might occur
- Avoidance of social situations in social anxiety versus panic disorder?

Etiology of GAD

- GABA system deficits
- Borkovec's cognitive model:
  - Worry is *reinforcing* because it distracts from **negative emotions and images**
  - Worry is associated with a decrease in physiological arousal
  - Underlying anxiety never extinguishes because of *avoidance*

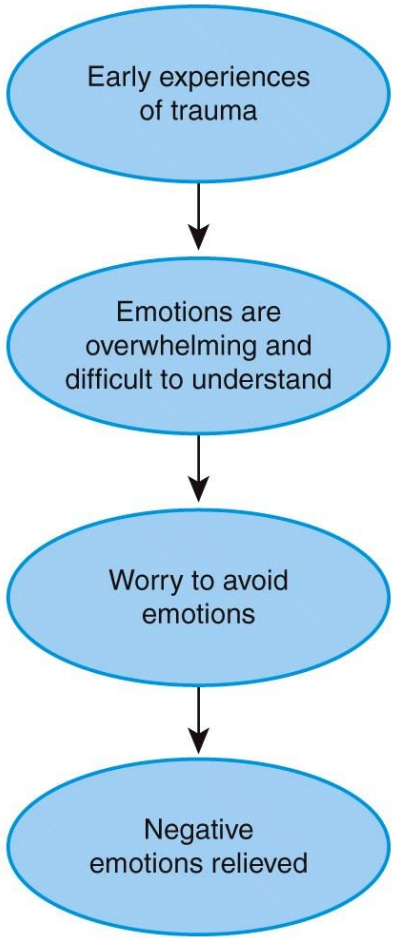


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Treatment of the Anxiety Disorders

- Psychological treatments emphasize…

Exposure

- Face the situation or object that triggers anxiety
  - Should include as many triggers as possible
  - Should be done in as many settings as possible
  - 70-90% effective

Example Exposure Hierarchy

1. Ask someone on the street to tell you what time it is
2. Approach **people** in conversation and ask one of them to tell you the time
3. Ask someone **familiar** at work to help you find a file
4. Ask someone **unfamiliar** at work to help you find a file
5. Ask someone **familiar** at work about their weekend
6. Ask someone **unfamiliar** at work about their weekend
7. Wear a crazy hat on the bus
8. Dress up as a pirate and go out to lunch in public

Treatment of the Anxiety Disorders

- Systematic desensitization
  - Relaxation plus imaginal exposure
    - Relaxation may not be needed!
- Cognitive approaches
  - Increase belief in client's ability to cope with the anxiety trigger
  - Challenge expectations about negative outcomes

Medications that Reduce Anxiety

- Sedatives/minor tranquilizers/anxiolytics
- Two types:
  - Benzodiazepines (Valium, Xanax)
  - Antidepressants (SSRIs)
- Problems
  - Significant side effects, withdrawal symptoms, relapse upon stopping
  - Adding ***anxiolytics*** to psychological treatment → worse outcomes

Trauma-Related Disorders

- **Posttraumatic stress disorder (PTSD)**
- **Acute stress disorder (ASD)**

- Unique because they can only be diagnosed after a person has experienced a traumatic event
  - Only class of disorders where the CAUSE is an inherent part of the diagnosis
- Though we've known about trauma responses for a long time (e.g., "shell shock"), PTSD only developed after the Vietnam War

Posttraumatic Stress Disorder

- Extreme response to severe stressor
  - Anxiety, avoidance of stimuli associated with trauma, emotional numbing, increased arousal
- Symptoms are grouped into 4 major categories:
  1. Reexperiencing (e.g., intrusive thoughts, nightmares)
  2. Avoidance (e.g., thought suppression)
  3. Mood and Thought change (e.g., inability to feel positive emotions)
  4. Hyperarousal (e.g., exaggerated startle response, arousal or reactivety)

Types of Traumas

- Must be a severe trauma

Traditional concept: *Experienced or witnessed events that involve actual or threatened death, serious injury, or sexual violation*

- Examples
  - Combat
  - Sexual Assault
  - Car accident
- Vicarious trauma
  - Secondary experience of event.

Category	Description
Life threat to self	Personal exposure to the threat of death or actual threatened serious injury
Life threat to others	Personal exposure to the actual or threatened death of others
Aftermath of violence	Personal exposure to grotesque or haunting images, sounds, or smells of dead or severely injured humans or animals
Traumatic loss	Witnessed or learned about the death of a family member, friend, or unit member
Moral injury by self	Committing an act of that is perceived to be a gross violation of moral or ethical standards (e.g., killing others)
Moral injury by others	Witnessing or being victim of an act that is perceived to be a gross violation of moral or ethical standards

Facts about PTSD

- Symptoms are chronic
  - ½ experience symptoms 1 year later
- Suicidal ideation is common
- Highly comorbid
  - Anxiety, depression, substance abuse, conduct disorder
- Women 2x as likely as men to develop PTSD
  - BUT...
    - After controlling for early life circumstances (e.g., childhood sexual abuse), men = women
- Some cultural groups (e.g., immigrants) are at elevated risk of PTSD due to high frequency of trauma

DSM-5 Criteria for PTSD

A. The person was exposed to death or threatened death, actual or threatened serious injury, or actual or threatened sexual violation, in one or more of the following ways: experiencing the event personally, witnessing the event, learning that a violent or accidental death or threat of death occurred to a close other, or experiencing repeated or extreme exposure to aversive details of the event(s) (e.g., first responders collecting body parts; police officers repeatedly exposed to details of child abuse)
B. At least 1 of the following intrusion symptoms:
• Recurrent, involuntary, and intrusive distressing memories of the trauma, or in children, repetitive play regarding the trauma themes
• Recurrent distressing dreams related to the event(s)
• Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the trauma(s) were recurring
• Intense or prolonged distress or physiological reactivity in response to reminders of the trauma(s)
C. At least 1 of the following avoidance symptoms:
• Avoids internal reminders (thoughts, feelings, or physical sensations) that arouse recollections of the trauma(s)
• Avoids external reminders (people, places, conversations, activities, objects, situations) that arouse recollections of the trauma(s).

DSM-5 Criteria for PTSD

D. At least 3 (or 2 in children) negative alterations in cognitions and mood that began or worsened after the trauma(s):
• Inability to remember an important aspect of the trauma(s)
• Persistent and exaggerated negative expectations about one's self, others, or the world
• Persistently excessive blame of self or others about the trauma(s)
• Pervasive negative emotional state
• Markedly diminished interest or participation in significant activities.
• Feeling of detachment or estrangement from others
• Persistent inability to experience positive emotions (e.g., unable to have loving feelings, psychic numbing)
E. At least 3 (or 2 in children) of the following alterations in arousal and reactivity that began or worsened after the trauma(s):
• Irritable or aggressive behavior
• Reckless or self-destructive behavior
• Hypervigilance
• Exaggerated startle response
• Problems with concentration
• Sleep disturbance -- for example, difficulty falling or staying asleep, or restless sleep
F. The symptoms began or worsened after the trauma(s) and continued for at least one month

Acute Stress Disorder

- Symptoms similar to PTSD
- Shorter duration!
  - Symptoms occur between **3 days** and **1 month** after trauma
- Controversial diagnosis
  - **May stigmatize common short term reactions**
    - As many as 90% of rape victims experience PTS symptoms
  - **Most people do not go on to develop PTSD**
- However, ASD does predict higher risk of PTSD within 2 years
- 30%-50% percent.

DSM-5 Criteria for ASD

A. The person was exposed to death or threatened death, actual or threatened serious injury, or actual or threatened sexual violation, in one or more of the following ways: *experiencing the event personally, witnessing the event, learning that a violent or accidental death or threat of death occurred to a close other, or experiencing repeated or extreme exposure to aversive details of the event(s) (e.g., first responders collecting body parts; police officers repeatedly exposed to details of child abuse)*

B. At least 8 of the following symptoms began or worsened since the trauma and lasted 3 to 31 days:

- **Recurrent, involuntary, and intrusive distressing memories of the traumatic event**
- **Recurrent distressing dreams related to the traumatic event**
- **Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event were recurring**
- **Intense or prolonged psychological distress or physiological reactivity at exposure to reminders of the traumatic event**
- **A subjective sense of numbing, detachment from others, or reduced responsiveness to events**
- **An altered sense of the reality of one's surroundings or oneself (e.g., seeing oneself from another's perspective, being in a daze, time slowing)**
- **Inability to remember at least one important aspect of the traumatic event**
- **Avoids internal reminders that arouse recollections of the trauma(s)**
- **Avoids external reminders that arouse recollections of the trauma(s).**
- **Sleep disturbance**
- **Hypervigilance**
- **Irritable or aggressive behavior**
- **Exaggerated startle response**
- **Agitation or restlessness**

Etiology of PTSD

- Shares many risk factors with other anxiety disorders
  - Genetic predisposition
  - Increased activity in the fear-circuit
  - Childhood exposure to trauma
  - Selective attention to threat
  - Neuroticism

- Two-factor model of conditioning

  (1) Fear is paired with the stimuli

  (2) Avoidance behavior reduces anxiety and reinforces fear
  - Example?

Unique Etiological Factors

- Nature of trauma
  - Highest risk for most *severe trauma*
    - 20% of fighters in Vietnam versus 50% of POWs
  - Traumas caused by humans are more likely to cause PTSD than natural disasters
- Neurobiological
  - Smaller hippocampal volume linked to PTSD
- Avoidance coping, dissociation, memory suppression
- Intelligence, social support, and ability to grow from the experience enhance coping

Posttraumatic Growth

- What is posttraumatic growth?
  - Refers to positive psychological change experienced as a result of the struggle with highly challenging life experiences
  - May involve greater appreciation of life, altered priorities, more intimate relationships, greater personal strength
- Can coexist with negative psychological adjustment
- ReSolve: A Guide to Posttraumatic Growth

Medical Treatment of PTSD and Acute Stress Disorder

- SSRIs effective for the treatment for PTSD
- However...
  - Relapse is common when medication is discontinued

Psychological Treatment of PTSD

- **Exposure Therapy**
  - Focuses on *memories* and *reminders* of the trauma
  - Types of exposure
    - In vivo
    - Imaginal (includes writing a trauma narrative)
    - Virtual reality
  - More effective than meds or supportive therapy
  - Can be difficult at first

- **Cognitive Therapy**
  - Bolster beliefs in ability to cope
  - Dispute unhelpful beliefs (Ex: self-blame)

Obsessive-Compulsive and Related Disorders

- Obsessive-Compulsive Disorder (OCD)
  - Repetitive thoughts and urges
  - Repetitive behaviors and mental acts

- Body Dysmorphic Disorder
  - Repetitive thoughts and urges about personal appearance

- Hoarding Disorder
  - Repetitive thoughts about possessions

Obsessive-Compulsive Disorder

- Obsessions = **Intrusive, persistent**, and **uncontrollable** thoughts or urges
  - Usually experienced as *irrational*
  - Most common foci:
    - Contamination, sexual and aggressive impulses, body problems, religion, and symmetry/order

Obsessive-Compulsive Disorder

- Compulsions = Repetitive behaviors or mental acts that are done **impulsively** to **neutralize anxiety**
  - Ex: cleaning, counting, touching, checking
- Extremely difficult to resist the impulse
- May involve elaborate behavioral rituals
- Compulsive gambling, eating, NOT considered compulsions, since often pleasurable

DSM-5 Criteria for Obsessive-Compulsive Disorder

Obsessions (recurrent, intrusive, persistent, *unwanted* thoughts, *urges*, or images *that the person tries to ignore, suppress, or neutralize)*

OR

Compulsions (repetitive behaviors or thoughts that a person feels compelled to perform to prevent distress or a dreaded event or *that a person feels driven to perform in response to an obsession*)

The obsessions or compulsions are time consuming *(e.g., require at least 1 hour per day)*, or cause clinically significant distress or impairment

Facts about OCD

- Two modal ages of onset:
  - Before age 10
  - Late adolescence/early adulthood
- Slightly more common in women (1.5x) than men
- Often chronic
  - Only 20% complete recovery 40 years later
- Highly comorbid
  - 75% have comorbid anxiety disorder
  - 66% have major depression
  - 33% have hoarding symptoms
  - Substance abuse is common

Body Dysmorphic Disorder

- Preoccupation with an *imagined* or *exaggerated* defect in appearance
  - Perceive themselves to be ugly or "monstrous"
  - Spend 3-8 hours/day thinking about appearance

- Engage in compulsive behaviors
  - Check appearance in mirrors
  - Camouflage their appearance (tanning, makeup, plastic surgery)

- High levels of shame, anxiety, and depression

Body Dysmorphic Disorder

- Symptoms are extremely distressing
  - Many report delusions (“people are laughing at me”)
  - 25% receive plastic surgery to “fix” flaws
  - 20% report suicidal ideation

- Symptoms are interfering
  - May avoid social interactions
  - Person may become housebound
  - 40% cannot work

DSM-5 Criteria for Body Dysmorphic Disorder

- Preoccupation with a *perceived* defect or markedly excessive concern over a slight defect in appearance
- The person has performed repetitive behaviors or mental acts (e.g., mirror checking, seeking reassurance, or excessive grooming) in response to the appearance concerns
- Preoccupation is not restricted to concerns about weight or fat

Facts about BDD

- Occurs slightly more often in women
- 2% prevalence rate; 5-7% for women seeking plastic surgery
- Average onset = late adolescence
- Nearly all have another comorbid disorder
- Many social/cultural factors
  - Body dissatisfaction more common in US than Europe
  - Focus of dissatisfaction may reflect cultural norms about what is beautiful
    - Ex: Japanese may focus on appearance of eyelids

Hoarding Disorder

- Characterized by:
  - Need to acquire possessions
  - Distress about parting with possessions
  - Cluttered living space

- Many have poor insight
  - 2/3 don’t see behaviors as problematic

Consequences of Hoarding Disorder

- Overwhelms person's home
  - Squalid living conditions
  - Overpowering odors
  - Inability to use part(s) of home
- Problems with physical health
  - Respiratory problems, poor hygiene, poor nutrition
- Interpersonal problems
- Financial problems
  - Many unable to work
  - Excessive acquiring can lead to debt

DSM-5 Criteria for Hoarding Disorder

- Persistent difficulty discarding or parting with possessions, regardless of the value others may attribute to these possessions
- Strong urges to save items and/or distress associated with discarding
- The symptoms result in the accumulation of a large number of possessions that clutter key areas of the home or workplace to the extent that their intended use is no longer possible unless others intervene.

Etiology Across OC Related Disorders: Neurobiological Factors

- Heritability
  - 30-50%
- Hyperactive regions of the brain:
  - Orbitofrontal cortex
  - Caudate nucleus
  - Anterior cingulate

Etiology of OCD

- Behavioral factors
  - Operant conditioning
    - Compulsions *negatively reinforced* by reducing anxiety
- Cognitive factors
  - Yedasentience*:* Subjective feeling of knowing
    - Intuitive sense that you've done something enough
    - Individuals with OCD have a *yedasentience deficit*
  - Attempts to suppress intrusive thoughts
    - Trying to suppress thoughts may make matters worse
  - Thought-action fusion
    - People with OCD may believe "If you think a bad thing will happen, it will happen"

Etiology of BDD

- CB model focuses on what happens when someone with BDD looks in mirror
  - No actual distortion of physical features
  - Overly attend to physical attractiveness
  - Focus on small details, rather than whole picture
  - Become engrossed in small flaws
  - Believe in an exaggerated importance of appearance

Etiology of Hoarding Disorder

- Evolutionary perspective
  - Adaptive to stockpile vital resources
  - Why does this basic instinct get out of hand for some people?

- Cognitive-behavioral factors
  - Poor organizational abilities
  - Unusual beliefs about possessions
  - Avoidance behaviors

Treatment for OC and Related Disorders

- Similar across disorders
- Medications
  - SRIs (Serotonin reuptake inhibitors)
    - 50% reduction in OCD symptoms
    - 50-75% response rate in BDD
    - Currently no pharmacological treatment studies looking at hoarding

Psychological Treatments

- Exposure and response prevention (ERP or EX/RP)
  - Not performing the ritual exposes the person to the full force of the anxiety provoked by the stimulus
  - The exposure results in the extinction of the conditioned response (the anxiety)
- Pros
  - Highly effective (more than meds)
  - Effective for children and adults
- Cons
  - Unpleasant in short term
  - Time intensive
  - 25% of people refuse EX/RP treatment

Psychological Treatments

- EX/RP for BDD
  - Tailor exposures to be relevant
    - Ex: Interact with people who will be critical of their looks
  - Avoid activities they use to reassure themselves
- EX/RP for hoarding disorder
  - Exposure = getting rid of objects
  - Response prevention = avoiding behaviors used to reduce anxiety (e.g., counting possessions)
  - Build insight
  - Help family to regain trust and rebuild relationships

Cognitive Psychology

Review Questions and Study Guide

Cognitive Area Example Questions

1. Which of the following describes when a person believes in a strong relationship between two events or characteristics when no relationship (or only a weak relationship) actually exists?

   A. reframing

   B. illusory correlation

   C. illicit conversion

   D. certainty bias

2. Which of the following is the part of sensory memory devoted to storing auditory information?

   A. iconic memory

   B. echoic memory

   C. semantic memory

   D. symbolic memory

3. According to the multicomponent model of working memory, which memory system would be responsible for people's ability to remember a list of nonsense syllables heard during a memory recall test?

   A. Visuospatial sketch pad

   B. Embedded memory

   C. Phonological loop

   D. Sensory memory

4. Researchers have found that even a very brief presentation of a stimulus can affect how a subsequent stimulus is processed. This is referred to as:

   A. priming

   B. semantic filtering

   C. mental effort

   D. selective attention

5. According to the 3-store model of memory, the process of transferring information from short-term memory to long-term memory is referred to as:

   A. storage

   B. slippage

   C. retrieval

   D. encoding

Cognitive Area Review

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Sensation vs. Perception

Sensation

- Process of receiving, converting, and transmitting raw sensory info from the external and internal environments to the brain.

Perception

- Process of selecting, organizing, and interpreting sensory information
- Construction of a mental representation of the external environment
- Influenced by experience-based expectations from memory

Sensation vs. Perception

Perception is the experience that results from interpreting sensory information; it requires two sources information:

Bottom-up

- Encoding of features in the environment via sensory receptors
- Information directly from sensory input

Top-down

- Directs attention in the environment based on expectations
- Conceptually driven interpretation from knowledge and experience

Perceptual Processes

How do we identify objects and actions in the environment?

Most theories of perception assume that sensory input is used in conjunction with top-down knowledge.

- How is top-down knowledge matched with sensory input and at what stage of perception?
- How strongly does top-down information impact the interpretation of bottom-up information?
- How does context influence how top-down and bottom-up information is used?

Perception

Phonemic restoration effect

Warren (1970)

- Subjects hear a sentence with a single phoneme masked by noise
- Subjects report hearing the masked phoneme as well as the masking noise, but cannot report the correct position of masking noise.
- This "filling in" demonstrates top-down influences on speech perception



● **FIGURE 11.1** Phonemic restoration effect. In the sound stimulus presented to the listener, the sound of the *s* in *legislatures* is masked by a cough sound. What the person hears is indicated below. Although the person hears the cough, he also hears the *s*.

Perception

Tulving et al., 1964

Word recognition speed is improved by:

- Meaningful sentence context
  - Top-down
- Increased exposure duration
  - Bottom-up

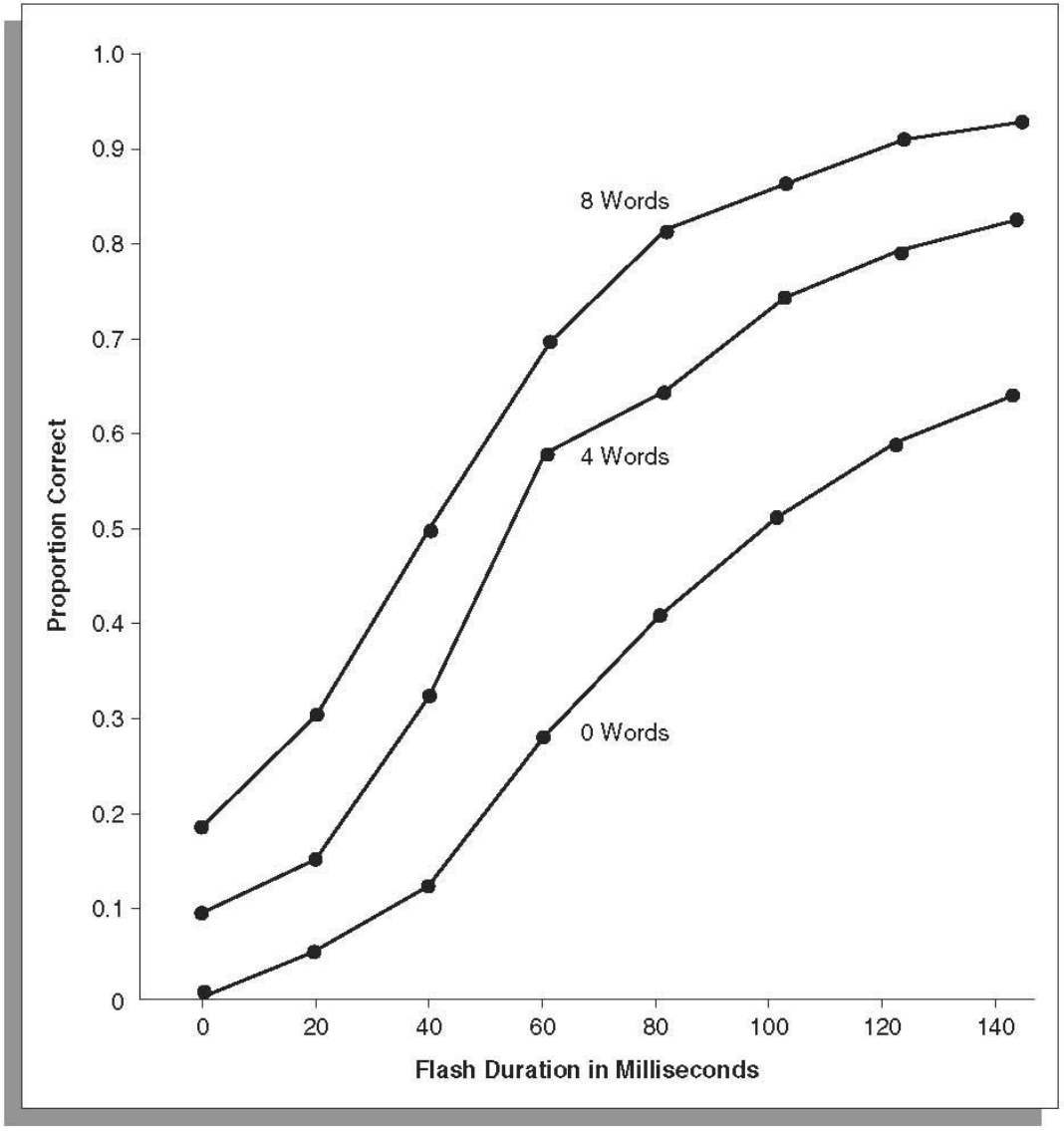


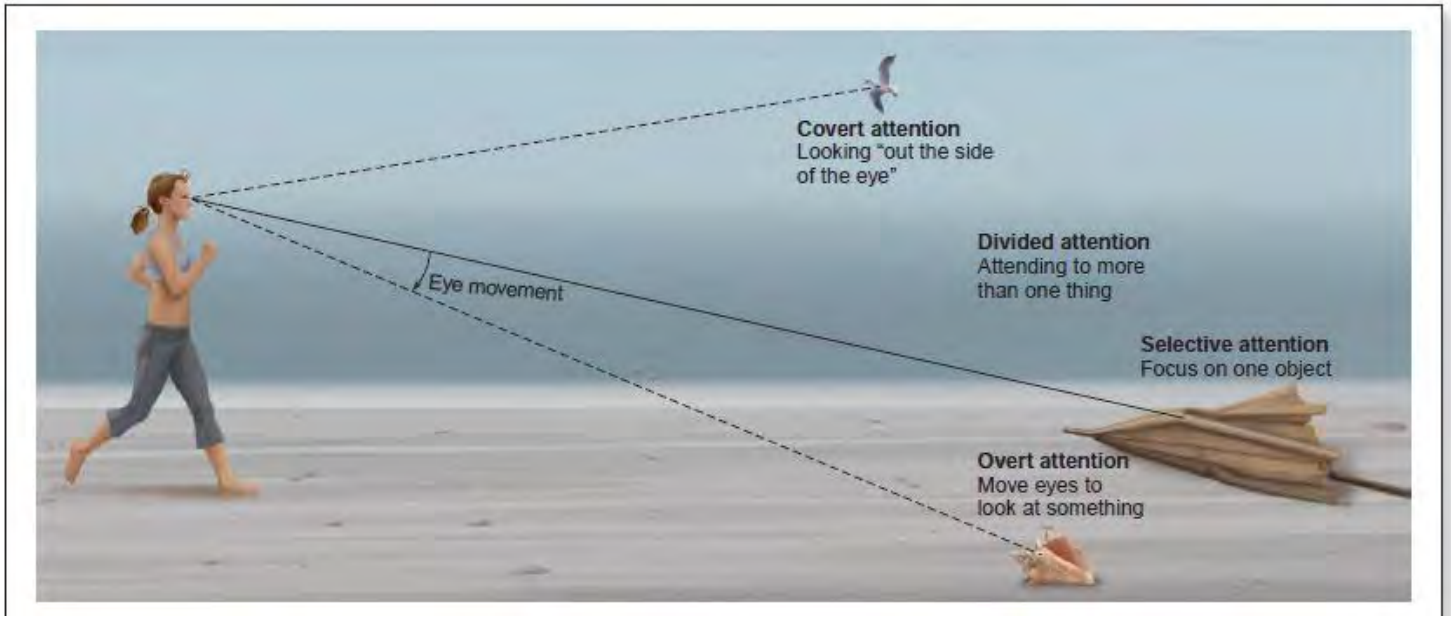
Figure 2.7 Word recognition varies with the amount of context provided.

SOURCE: From Tulving, E., Mandler, G., & Baumel, R., Interaction of two sources of information in tachistoscopic word recognition, in *Canadian Journal of Psychology, 18,* © 1964. Reprinted with permission.

Attention Basics

Selective attention - Ability to perceive a stimulus of interest while ignoring numerous other stimuli

Divided attention – Ability to allocate cognitive resources to two or more things simultaneously (objects, actions, events, thoughts, tasks, etc.)



Attention Basics

Distraction –one stimulus interfering with the processing of another stimulus.

Attentional capture – rapid and involuntary shifting of attention towards an unattended stimulus based on its sensory characteristics (e.g. loud noise, bright light, etc.)



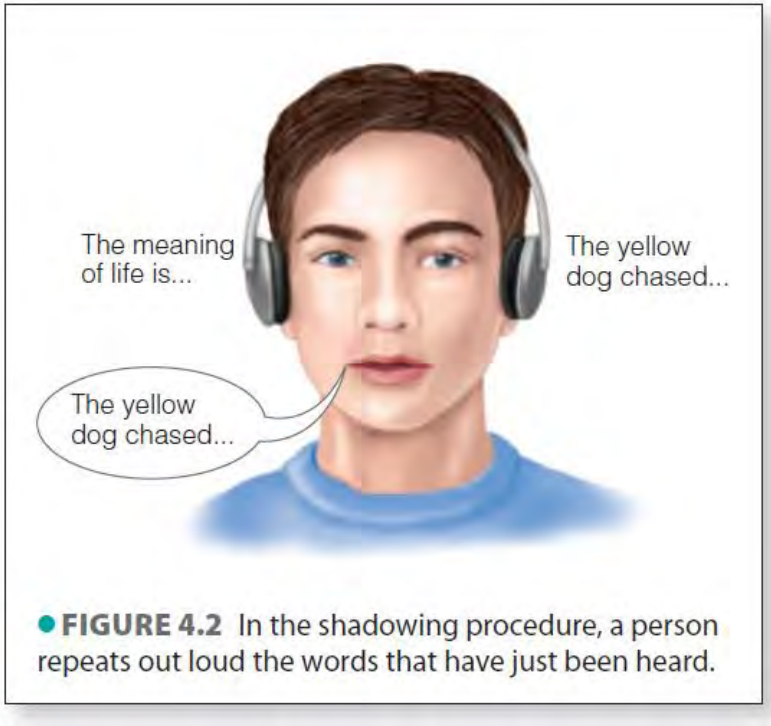


Studying Attention

Shadowing experiments - Cherry (1953)

- Each ear receives different speech input
- Subjects repeat (i.e. shadow) only what they hear in one ear

- Subjects could not report what was said in unattended ear
- They didn't even notice if the unattended language switched (e.g. English to German)
- They did notice if physical properties of the unattended speech changed (e.g. male to female voice)



● **FIGURE 4.2** In the shadowing procedure, a person repeats out loud the words that have just been heard.

Filter Theories – Early Selection

Early selection model of attention - Broadbent (1958)

- The filter limits the amount of information that can be processed (i.e. selective attention)
- Filter uses physical characteristics (e.g. pitch, location, volume, etc.) to identify and ignore unattended messages before they can be processed further

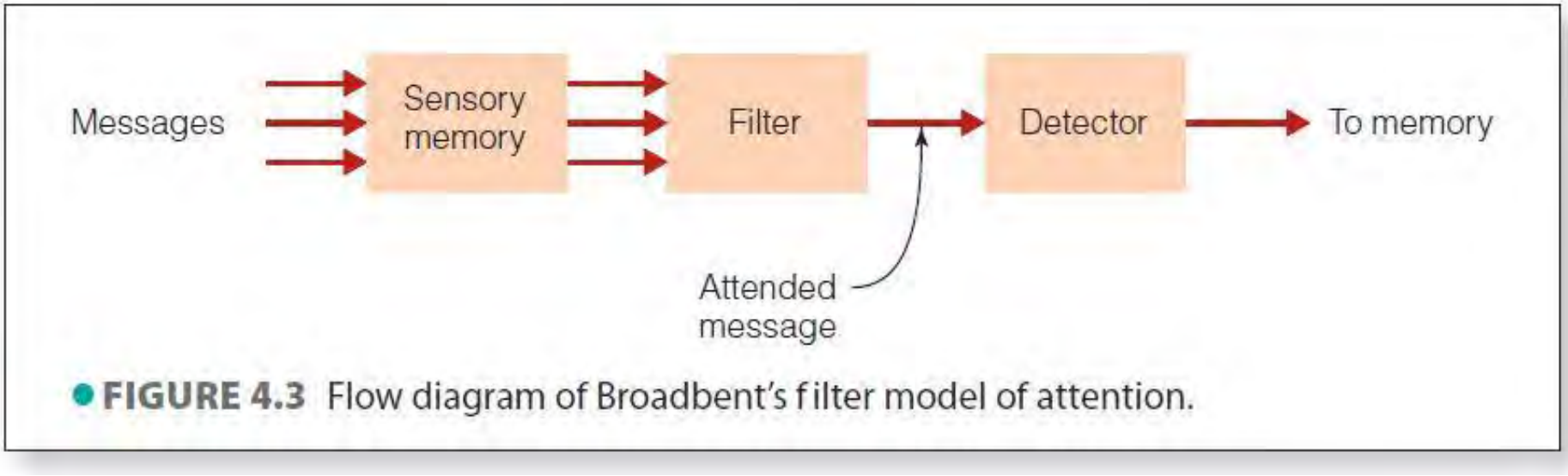


FIGURE 4.3 Flow diagram of Broadbent's filter model of attention.

Problems for early selection model

Cocktail Party Effect

- You can ignore other voices and sounds in a crowded room to focus on a single speaker

- The ability to "tune out" surrounding noise, focusing on one signal shows the effects of selective attention

- Yet, you can hear someone else say your name even though you weren't "paying attention"

- How much do we process unattended information?



Problems for early selection model

- Subjects reliably hear *their own* name in unattended ear (Moray, 1959).
- Subject errors show that some amount of meaning is accessed for unattended words (Gray & Wedderburn, 1960)
  - Incorrect "Dear Aunt Jane" instead of correct "Dear 7 Jane"

Early selection models predict that these effects *should not* occur since unattended messages are not supposed to be processed!

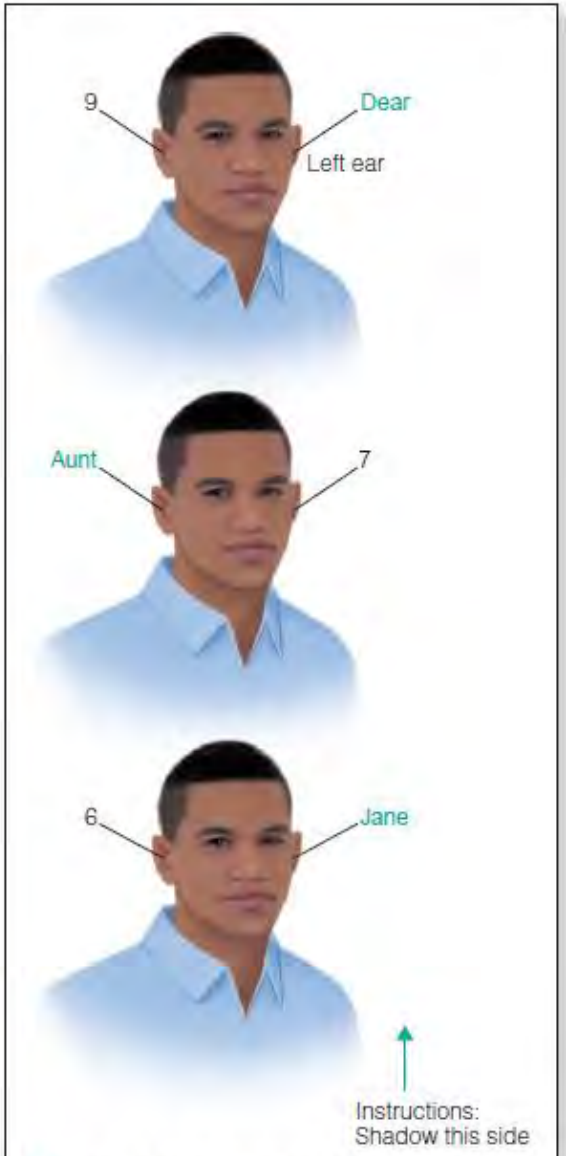


FIGURE 4.4 In Gray and Weddeburn's (1960) "Dear Aunt Jane" experiment, participants were told to shadow the message presented to the left ear. But they reported hearing the message "Dear Aunt Jane," which starts in the left ear, jumps to the right ear, and then goes back to the left.

Attenuation Model

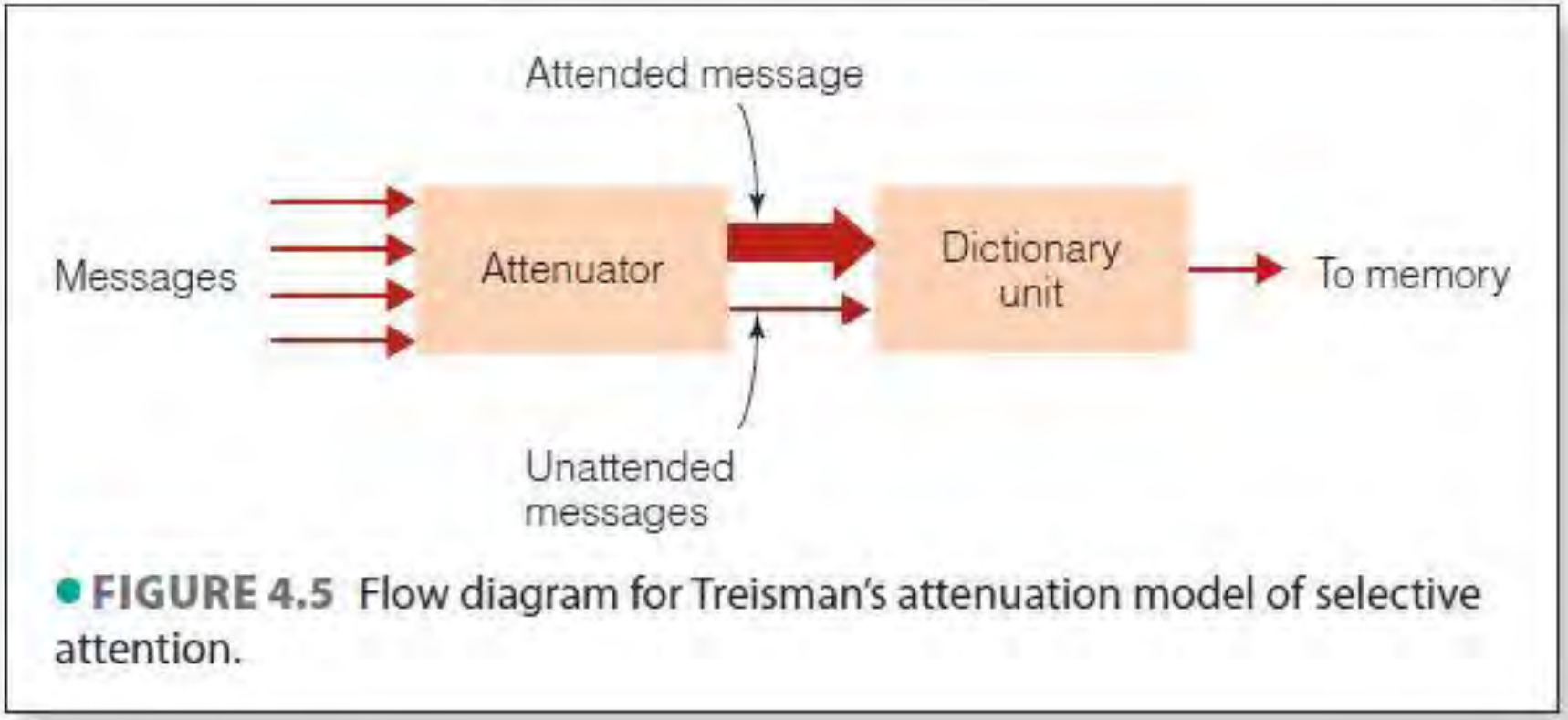
Attenuation model (aka leaky filter) – Treisman (1960)

Replaces filter with Attenuator that processes all incoming messages based on:

1. Physical characteristics
   - Sensory level - e.g. pitch, speed, loudness, direction
2. Whether sounds can be grouped into syllables and words
   - If words are detected – what is the meaning of words being heard?
   - Spoken language processed by *Dictionary Unit*

Unattended information is occasionally processed

Attenuation Model



● **FIGURE 4.5** Flow diagram for Treisman's attenuation model of selective attention.

- The attenuator transmits attended messages at full strength
- Unattended messages are attenuated but not completely blocked as in early selection theory.

Filter Theories

Early selection model of attention - Broadbent (1958)

- The filter limits the amount of information that can be processed (i.e. selective attention)
- Filter uses physical characteristics from sensory information to identify and ignore unattended messages before they can be processed further

Attenuation model (aka leaky filter) – Treisman (1960)

- The attenuator transmits attended messages at full strength
- Unattended messages are attenuated but not completely blocked as in early selection theory

Early Selection vs. Attenuation

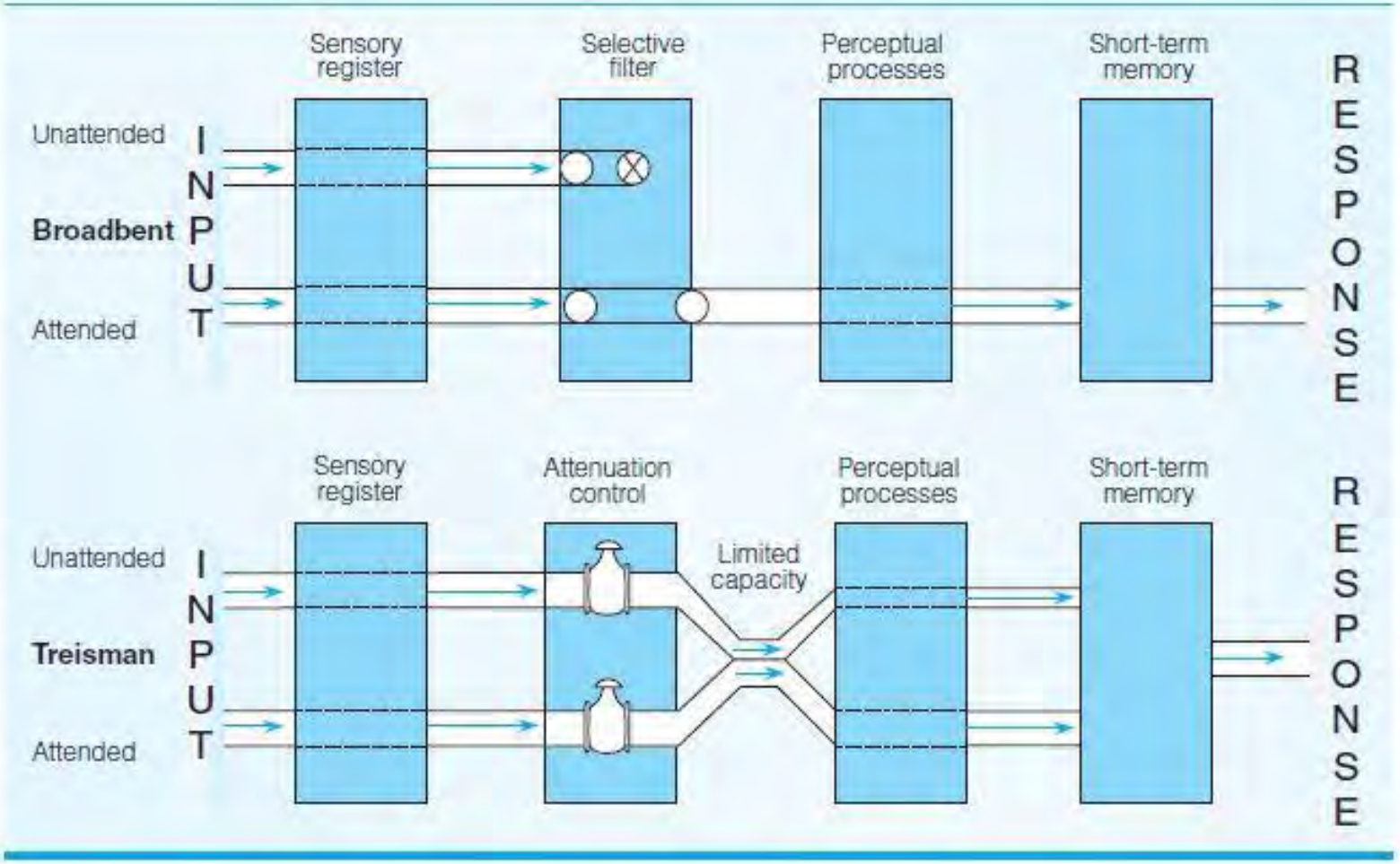


Figure 4.9 **Broadbent and Treisman's Models of Attention.**

Various mechanisms have been proposed suggesting a means by which incoming sensory information passes through the attentional system to reach high-level perceptual processes.

Capacity theories of attention

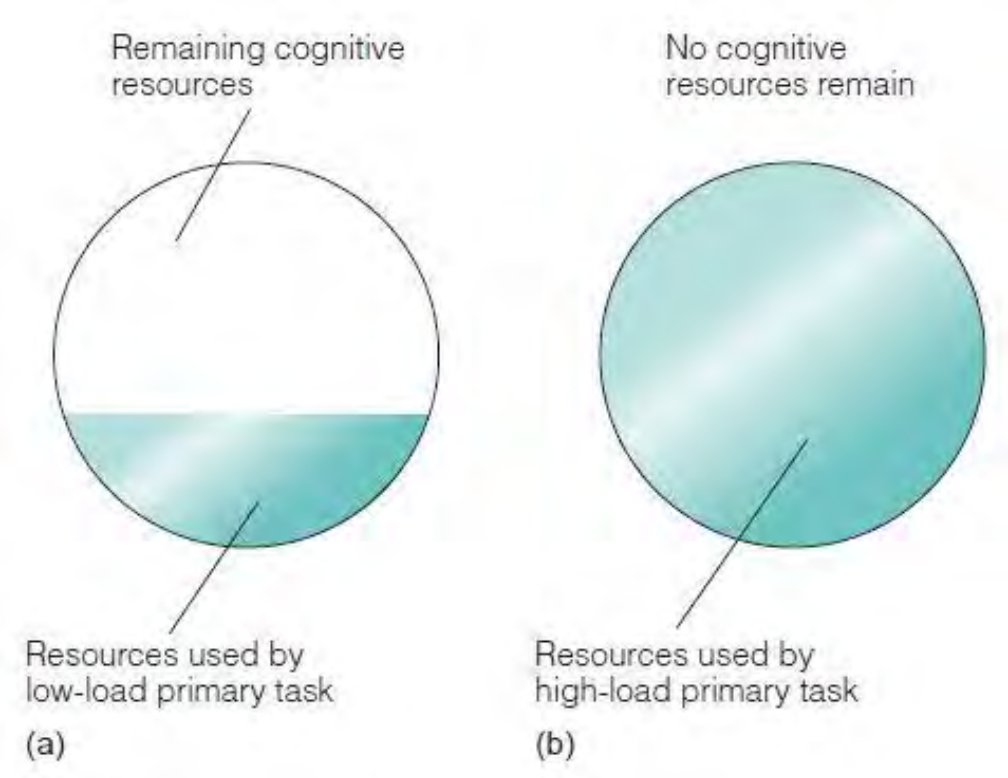
What are the limits of attention across tasks?

How many stimuli and/or tasks can be attended at any one time?

Capacity Theories of Attention

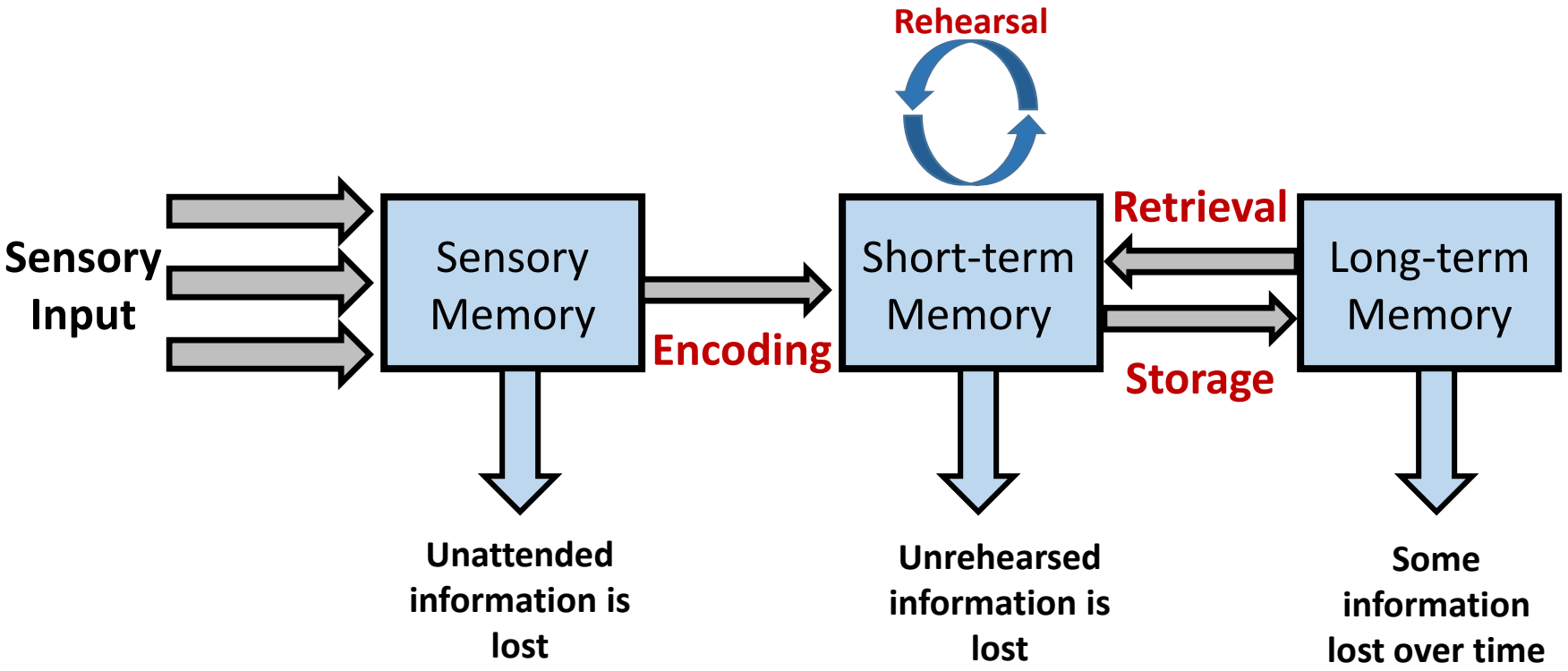
- There are limits to a person's capacity to perform mental work.
- With these limited cognitive resources we can perform various tasks, each of which carries some cognitive load.

- High-load tasks require take more resources than low-load tasks.
- Even this very simple model makes predictions…



Memory

Three-store model - Atkinson and Shiffrin (1968)



Memory Decay

Memory

Sensory memory (SM) – holds relatively large amount of information for less than a second

Short-term memory (STM) – holds relatively small amount of information for seconds

Long-term memory (LTM) – holds vast amount of information indefinitely (months, years, decades…)

Memory

Encoding

- Transferring information from sensory memory into short-term memory (requires attention and perception)

SM → STM

Storage

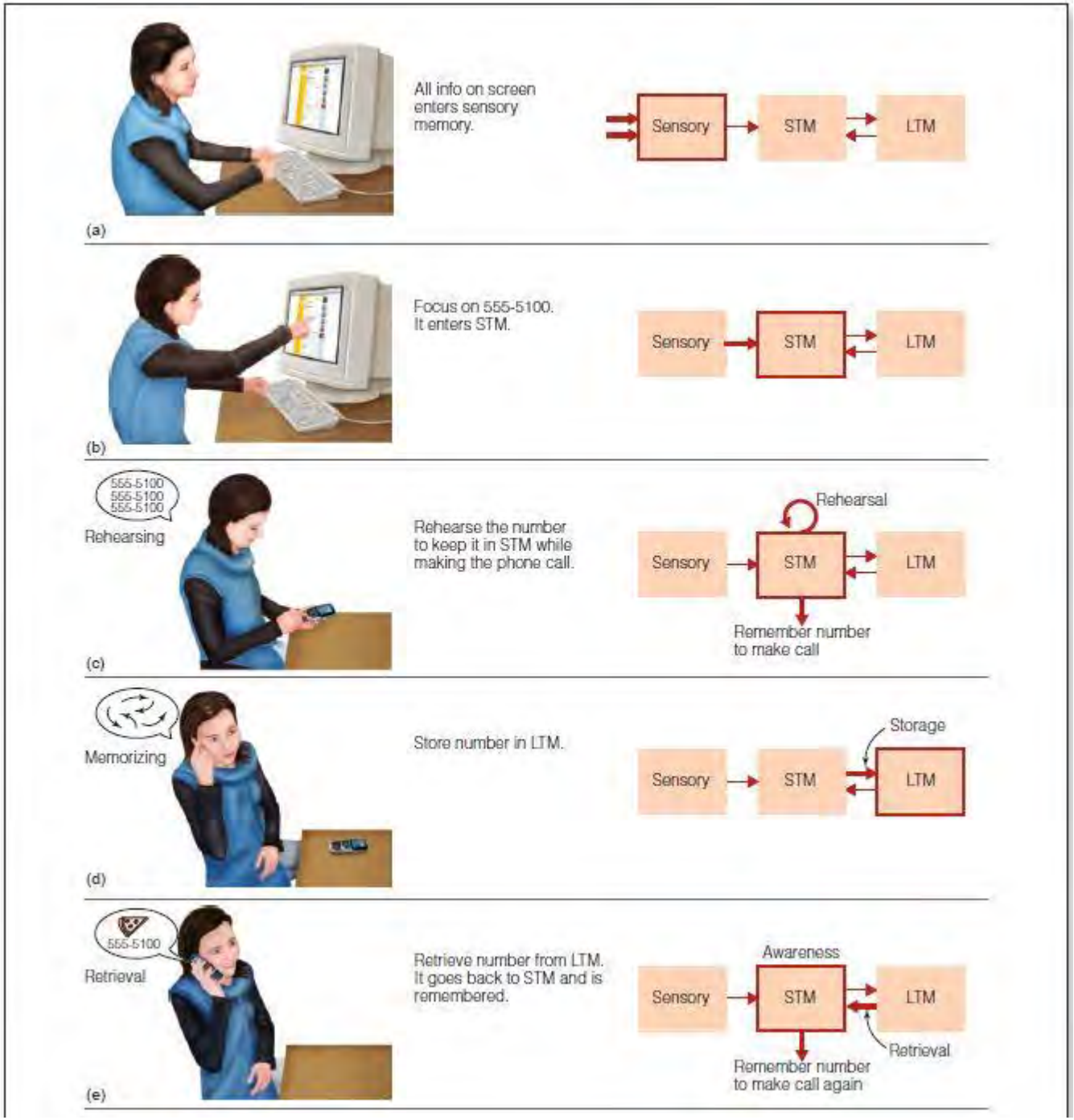
- Maintaining information in long-term memory

STM → LTM

Retrieval

- Moving information from long to short-term memory

LTM → STM



Attention used to encode into STM

Keep number in STM by rehearsal

Memorize number [storage in LTM]

Retrieve from LTM into STM later

Short-term memory

- STM capacity is about 4 items but can be increased to 7 or more with strategies like chunking
- STM duration is about 20 – 30 seconds for information that is not rehearsed.
- But not just because information **decays** over time…
- **Interference** also limits STM duration and capacity
- **Interference** also influences retrieval from LTM

Interference and Decay

Memory systems limited by both **Interference** and **Decay**

Decay – gradual loss of information in memory over time

- Sensory memory decays after 200 – 300 ms
- STM decays after ~ 20 seconds without rehearsal
- LTM decay is very difficult to establish experimentally

Proactive Interference

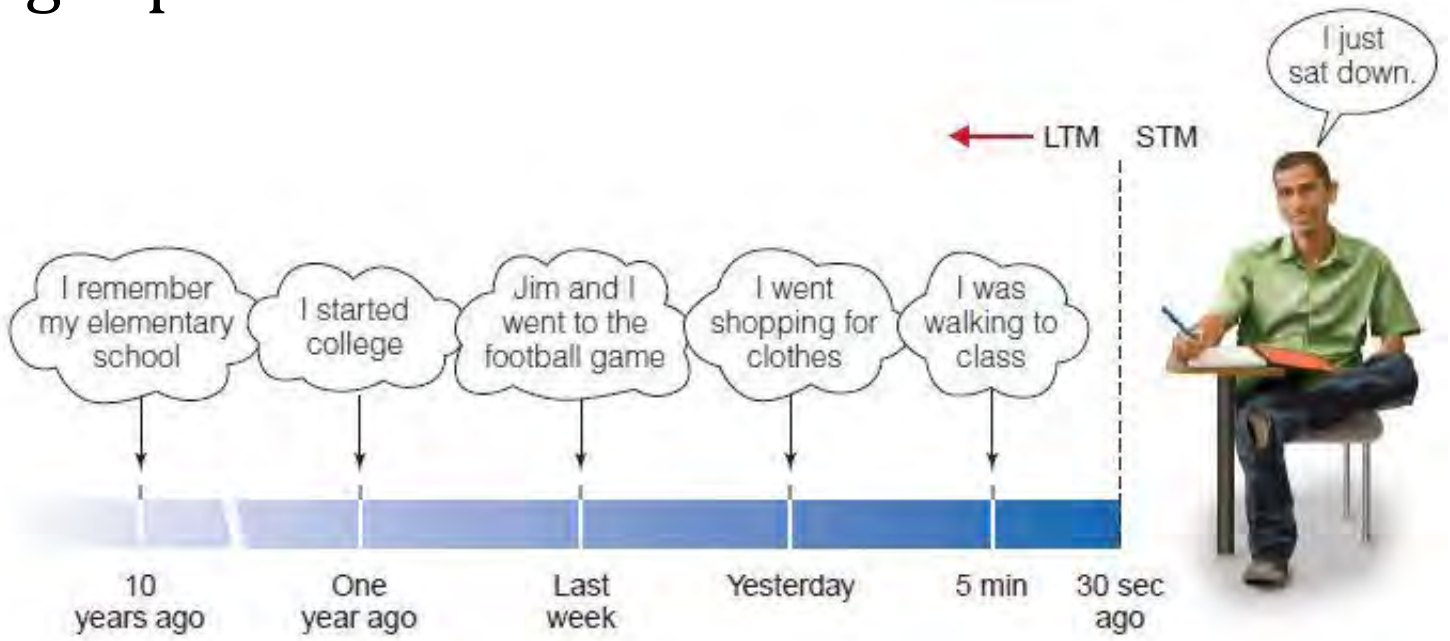
- When information that is already in memory prevents the recall of newer information

Retroactive Interference

- When new information in memory prevents the recall of older information

Distinguishing STM and LTM

The three-store model is just that – a model. What evidence is there for/against STM and LTM actually being separate?



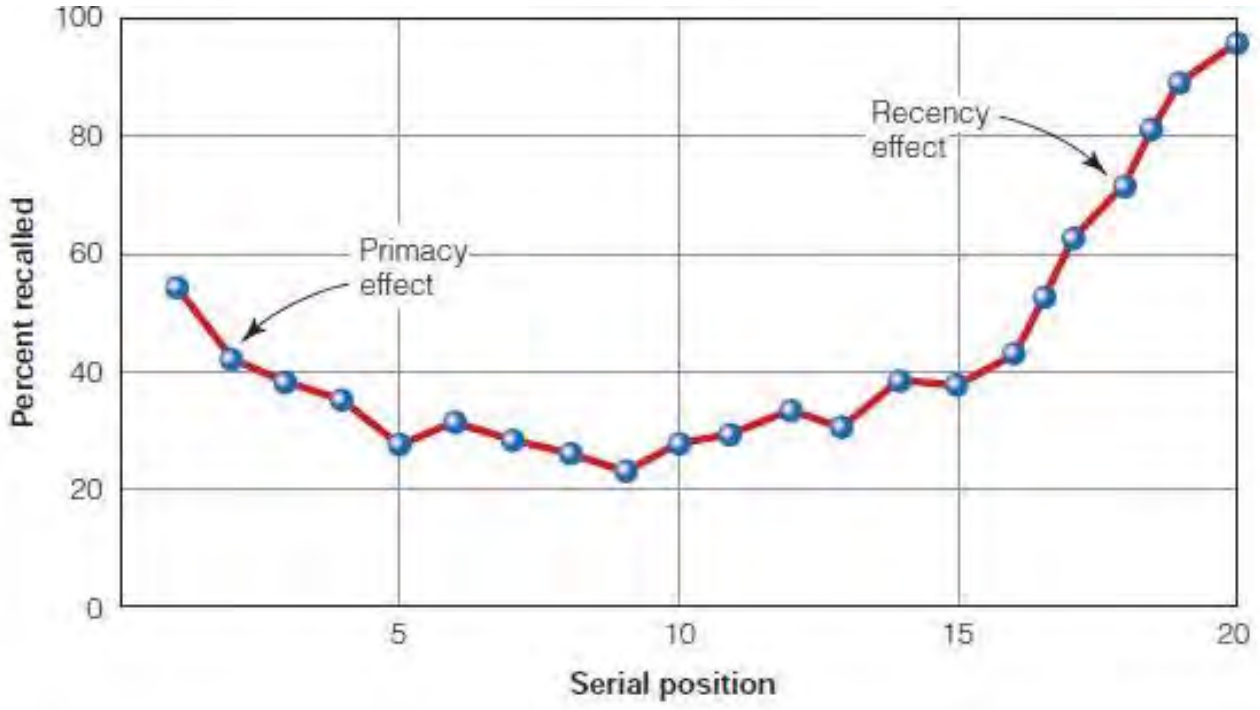
What happens when we want to remember a list of words?

Serial position curve

Serial position curve describes the typical pattern of results for free recall of lists

Primacy effect
- Improved recall for items at the beginning of a list

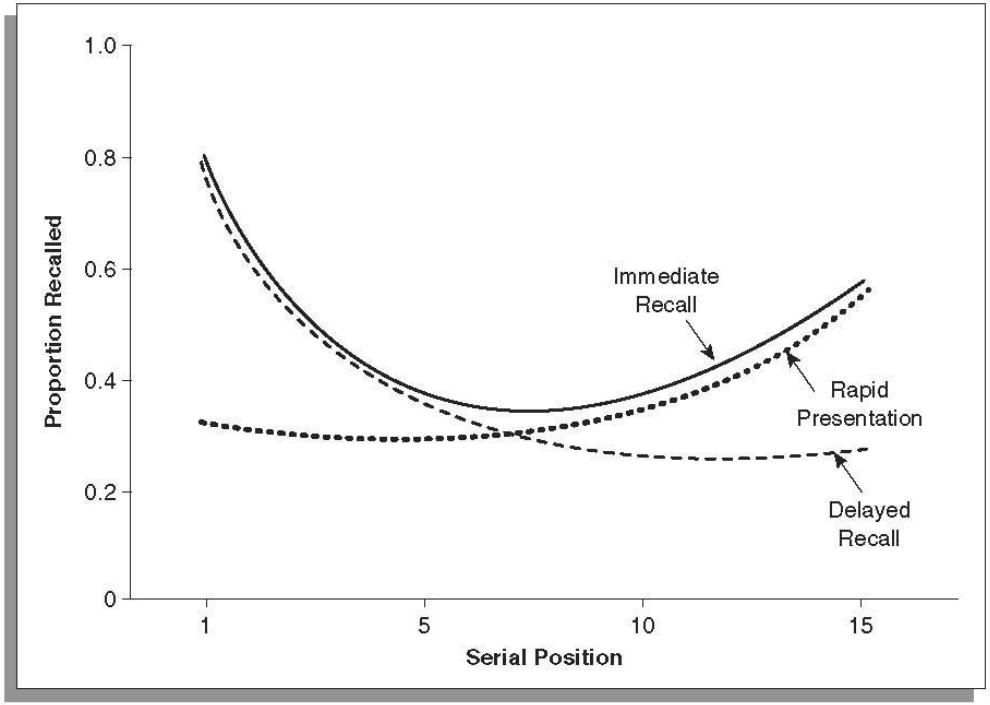
Recency effect
- Improved recall for items at the end of a list



Serial position curve

Primacy effect

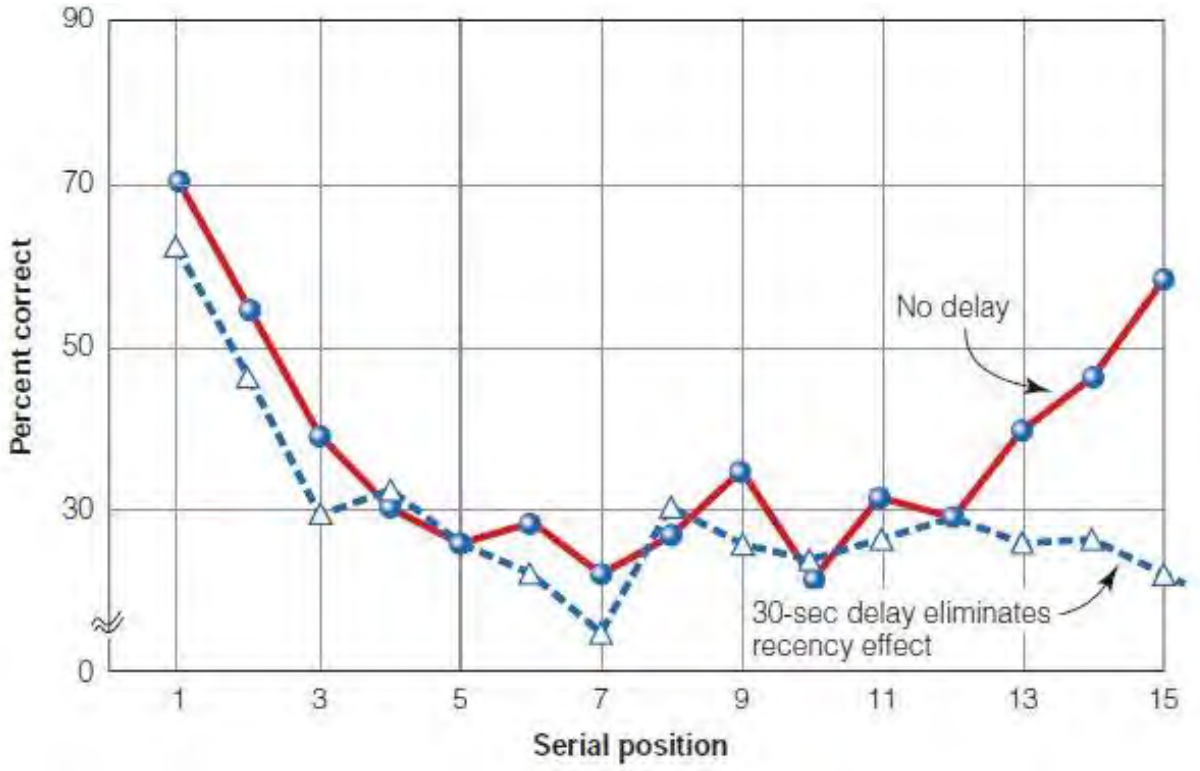
- All the words in the list *except* the last few must be stored in LTM for recall
- With words presented in rapid succession, subjects don't have time for rehearsal
- Primacy effect eliminated – early items cannot be rehearsed while new items are being rapidly encoded



Serial position curve

Recency effect

- The last few items can be stored in STM for recall
- Delaying recall allows for more time fore decay and interference
- After delay last items no longer in STM
  - As shown by dashed blue line



Serial position effects

Conclusions from the serial position curve:

- Primacy effect caused by retrieval of rehearsed items stored in long-term memory
  - Rapid presentation eliminates primacy effect but preserves recency effect
- Recency effect caused by retrieval from short-term store prior to memory decay or interference
  - Delayed recall (30 s) eliminates recency effect but preserves primacy effect

Results suggest that STM is separate from LTM

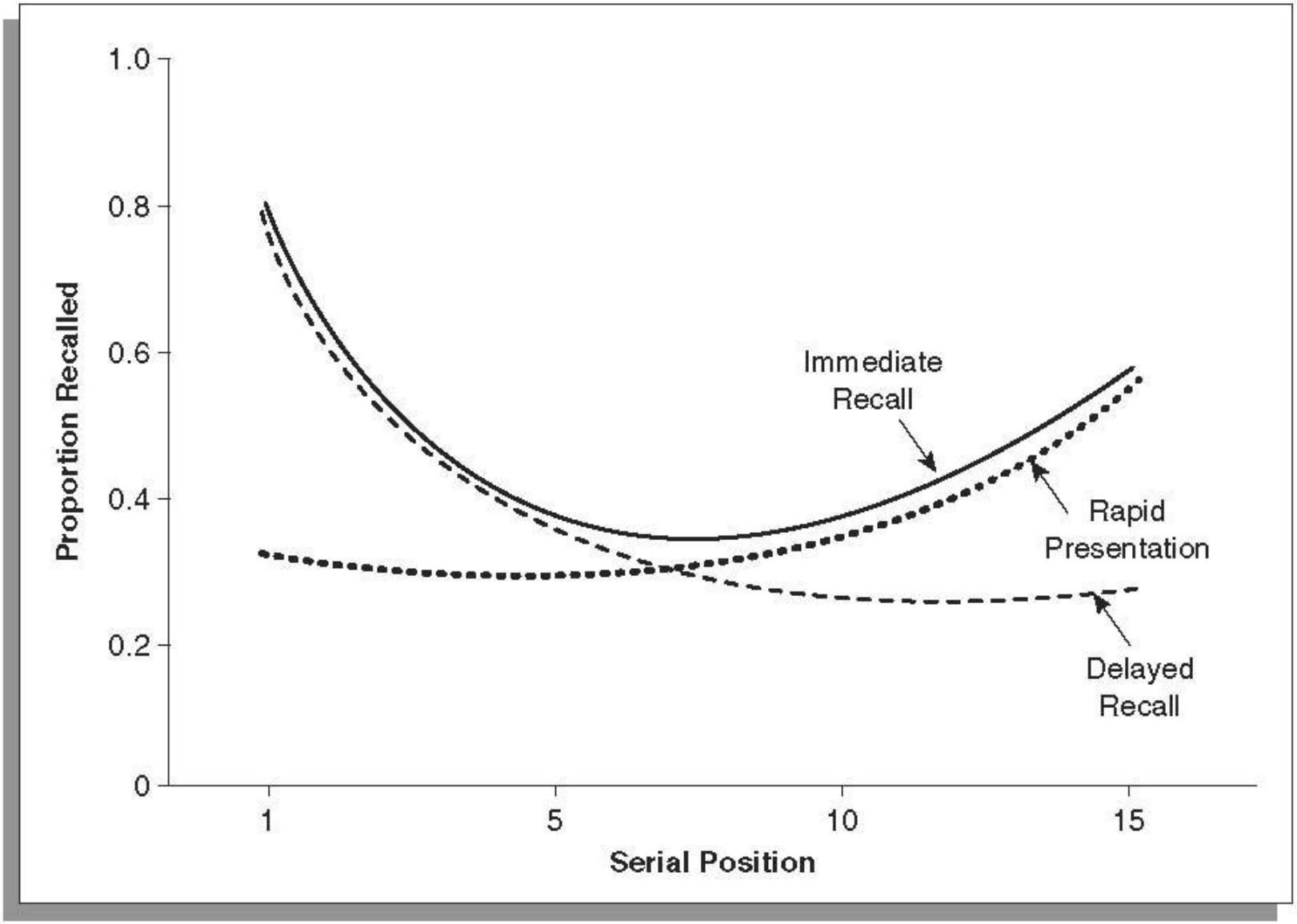


Figure 4.4 Serial position effects and the distinction between short-term and long-term memory.

Working Memory Theories

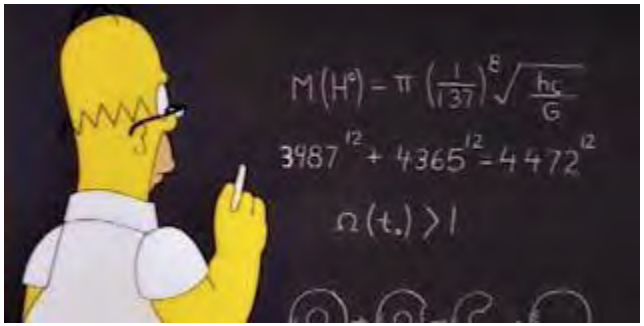
We do more than just STORE information in short-term memory. We also need to USE it to accomplish everyday cognitive tasks:

- Understanding and/or planning speech
- Walking or driving to work
- Making choices or solving problems

Working memory is a theory to describe how information is manipulated/transformed/processed when in short-term memory







Multicomponent Model of Working Memory

Baddeley & Hitch (1974)

1. Short-term storage of a limited amount of information.
   - the same function as STM in the 3-store model

2. Conscious manipulation of information while engaged in cognitive tasks
   - e.g. reasoning, language comprehension, motor action, deciding what you want to eat when reading a restaurant menu, etc.

WM differs from STM:

- STM is a single memory store, WM consists of multiple stores
- STM only describes how information is stored, WM is concerned with the use of information that occurs during cognition

Multicomponent Model of Working Memory

(Baddeley & Hitch, 1974)

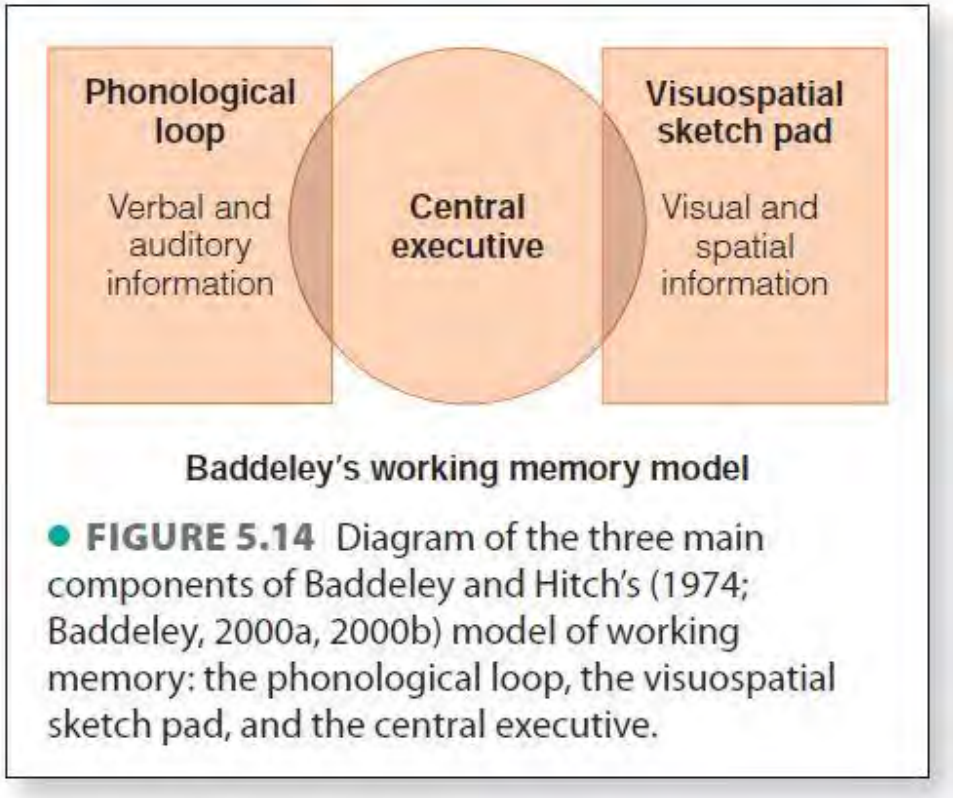
Phonological loop

- Holds and manipulates verbal or auditory information

Visuospatial sketch pad

- Holds and manipulates visual and spatial information

Both "buffers" hold information in storage using rehearsal



Baddeley's working memory model

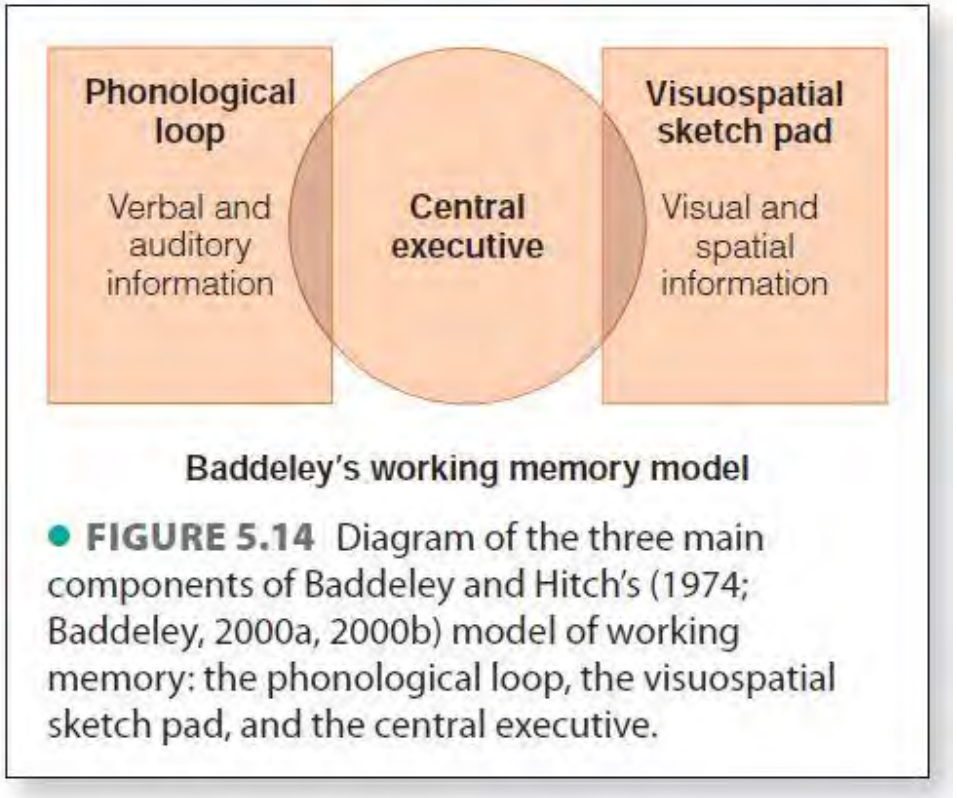
FIGURE 5.14 Diagram of the three main components of Baddeley and Hitch's (1974; Baddeley, 2000a, 2000b) model of working memory: the phonological loop, the visuospatial sketch pad, and the central executive.

Multicomponent Model of Working Memory

(Baddeley & Hitch, 1974)

Central executive

- Coordinates activity between phonological loop and visuospatial sketch pad
- Retrieves information from LTM for use
- Controls how attention is focused, divided, or switched
- Controls the suppression of irrelevant information



Baddeley's working memory model

FIGURE 5.14 Diagram of the three main components of Baddeley and Hitch's (1974; Baddeley, 2000a, 2000b) model of working memory: the phonological loop, the visuospatial sketch pad, and the central executive.

Later addition to Working Memory Model

(Baddeley, 1986)

Episodic buffer

- Temporary store for integrated memory of events including multiple senses
  - e.g. combination of sounds, sights, smells, feelings, etc.
- Large storage capacity and long duration compared to PL or VSSP

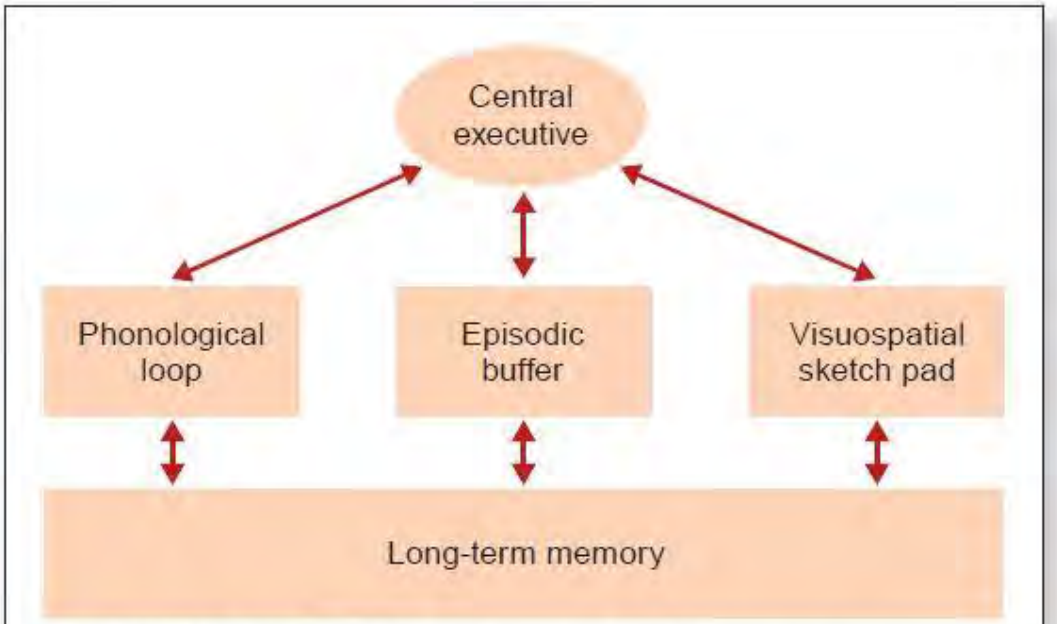
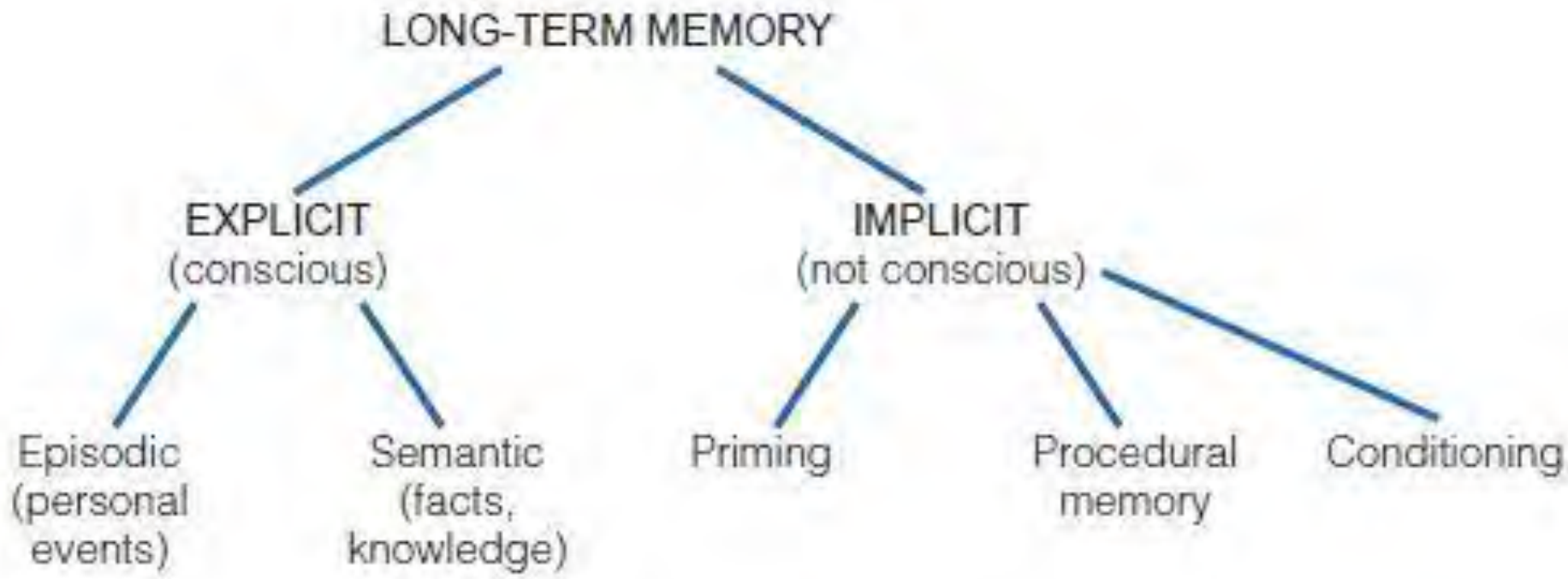


FIGURE 5.22 Baddeley's revised working memory model, which contains the original three components plus the episodic buffer.

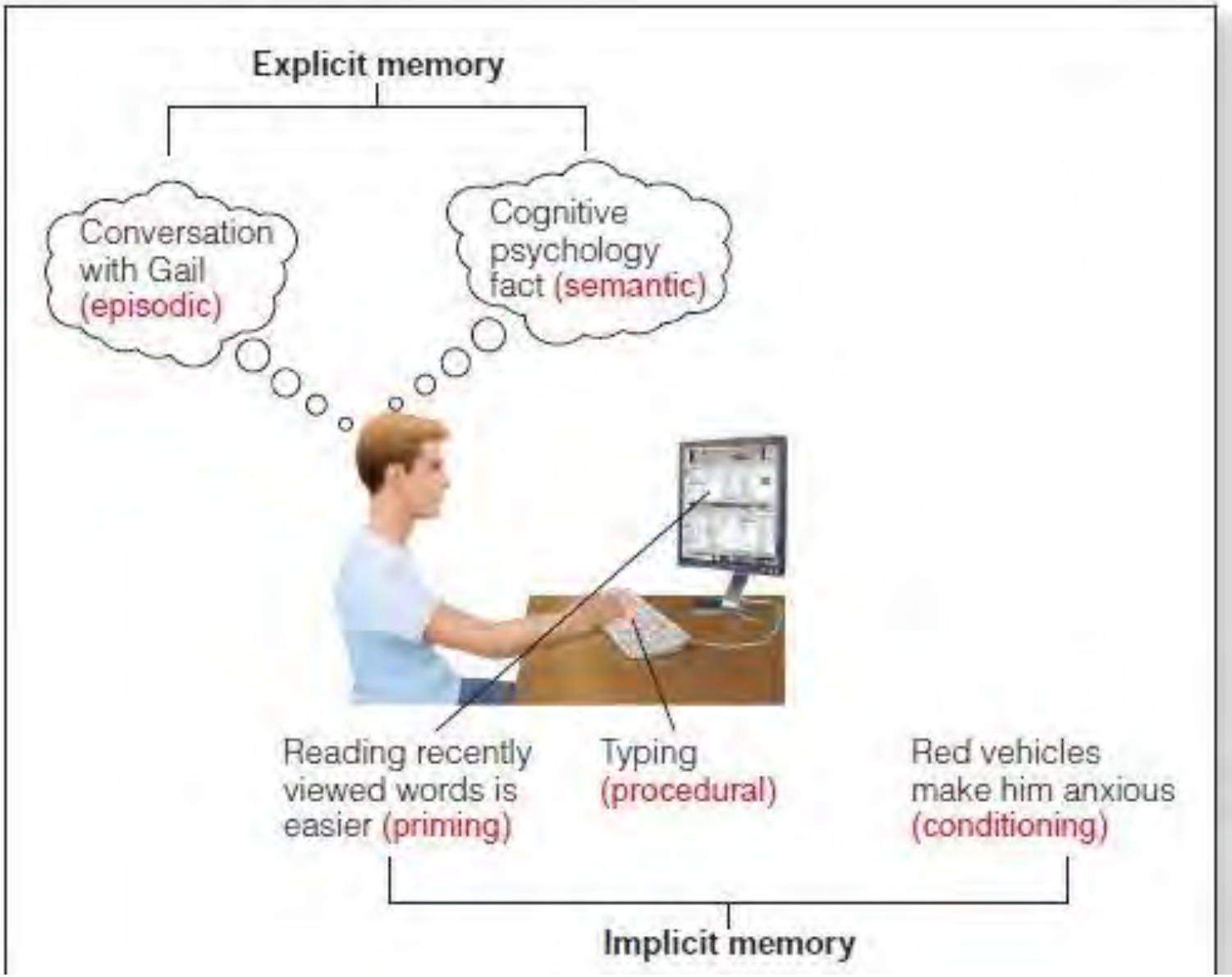
- Each short-term store is connected to long-term memory with interactions coordinated by central executive

Long-term Memory Systems

Declarative (explicit) and Non-declarative (implicit) LTM



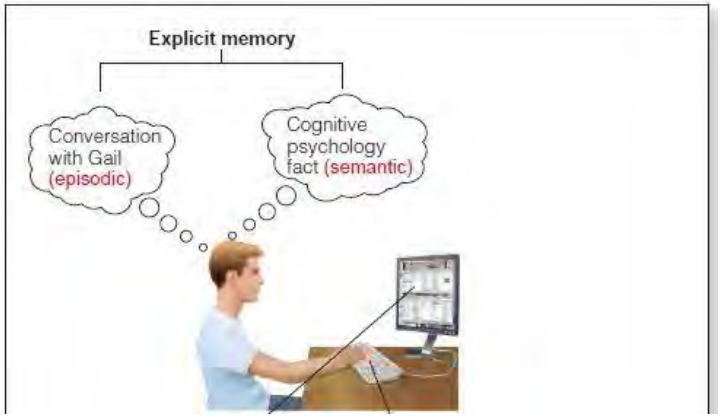
Long-term Memory Systems

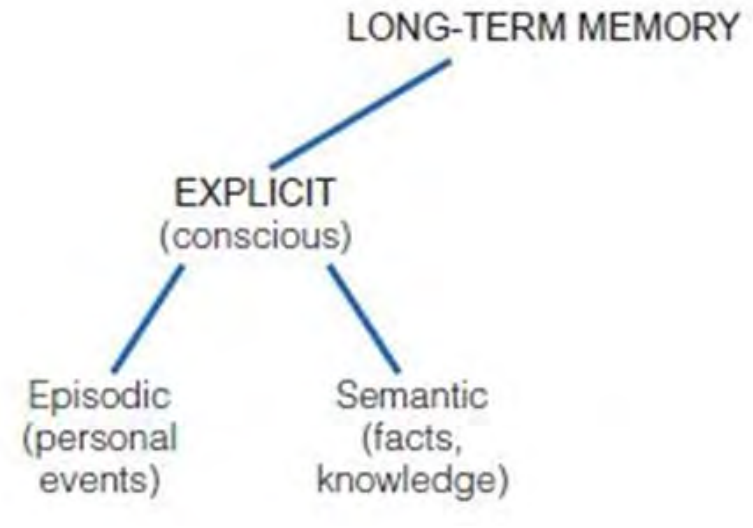


Explicit Memory

Knowledge of events, facts, and concepts

- Possible to access memories consciously (i.e. declarative) – *knowledge that can be stated*
- Two subsystems:
  - **Semantic memory** containing concepts and facts
    - Water is wet and most cars have four wheels
  - **Episodic memory** containing personal events and experiences
    - e.g. your memory of eating breakfast today





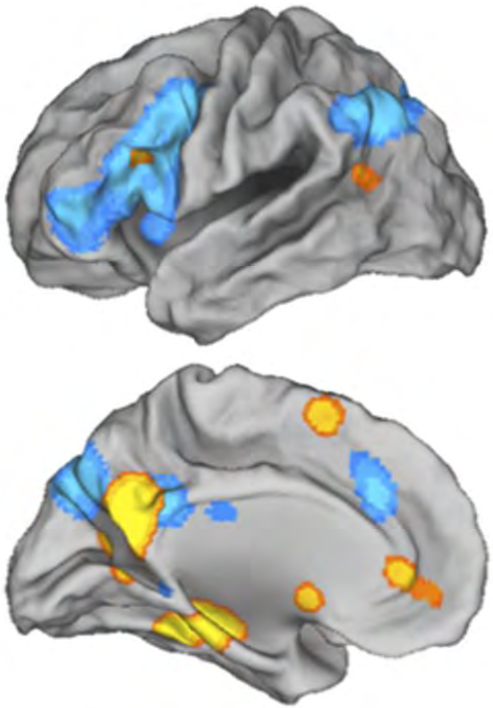
Explicit Memory

Semantic Memory

- Declarative knowledge that can be consciously retrieved
- Knowledge not necessarily tied to a specific time or place
- Semantic memory is more flexible other types of memory
  - Can be combined, adjusted, and manipulated more easily

"Remember – Know distinction"

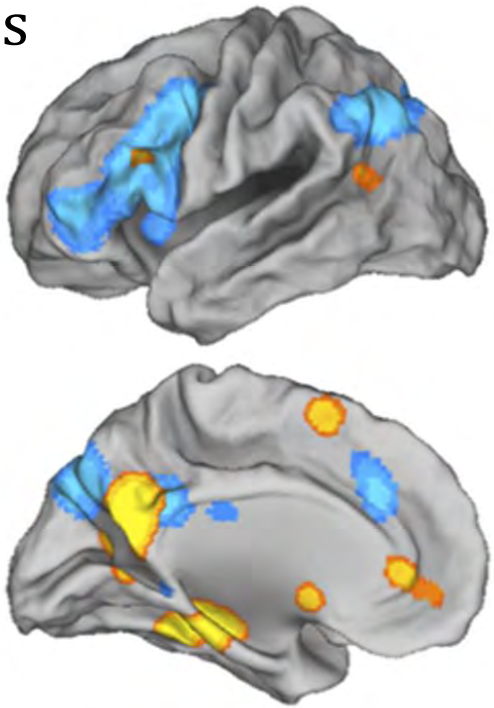
- I *remember* parking my car in a particular spot in the parking deck this morning.
- I *know* that the address of the parking deck and how to get there from home.



Explicit Memory

Episodic Memory

- Conscious recollection of specific past events from one's own experience
- *Always based on single exposure - inherently tied to spatial and temporal context (i.e. place and time)*
- Involves "mental time travel" and perceptual features
- Requires a sense of self and consciousness



"Remember – Know distinction"

- I *remember* parking my car in a particular spot in the parking deck this morning.
- I *know* that the address of the parking deck and how to get there from home.

Implicit Memory

Knowledge of ***how*** to do things – *Knowledge to be implemented*

- **Procedural memory**
  - Motor skills (hitting a baseball/typing on keyboard)
  - Perceptual skills (detecting a tumor in an x-ray image)
  - Cognitive skills (knowing grammar of native language)
  - Accessed unconsciously
  - Cannot be conveyed in words (i.e. non-declarative)
    - *You can't learn how walk or ride a bike from a book*
  - Describing how to run and actual running require different types of knowledge

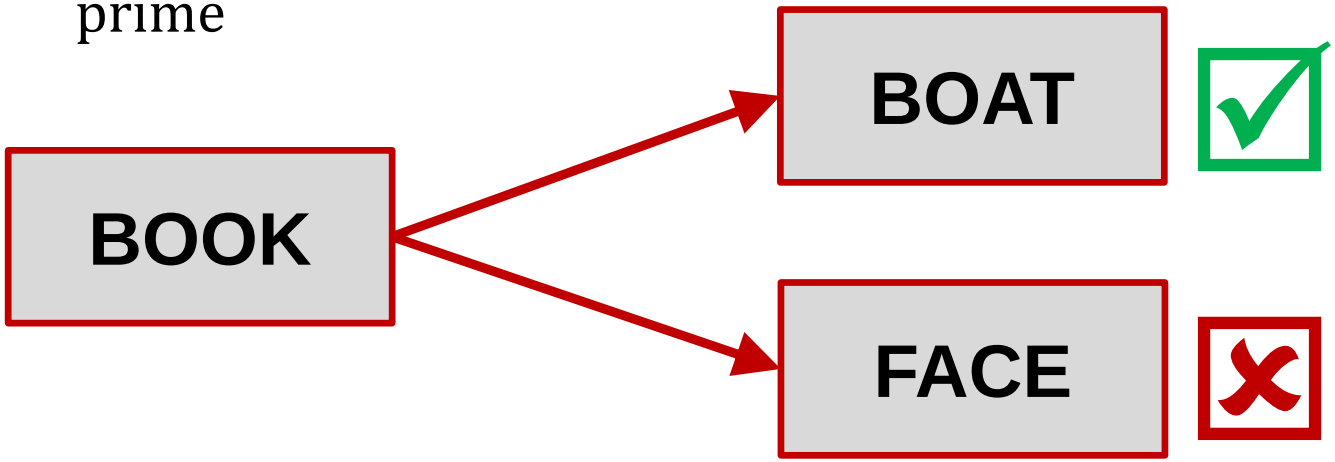




Implicit Memory

Priming

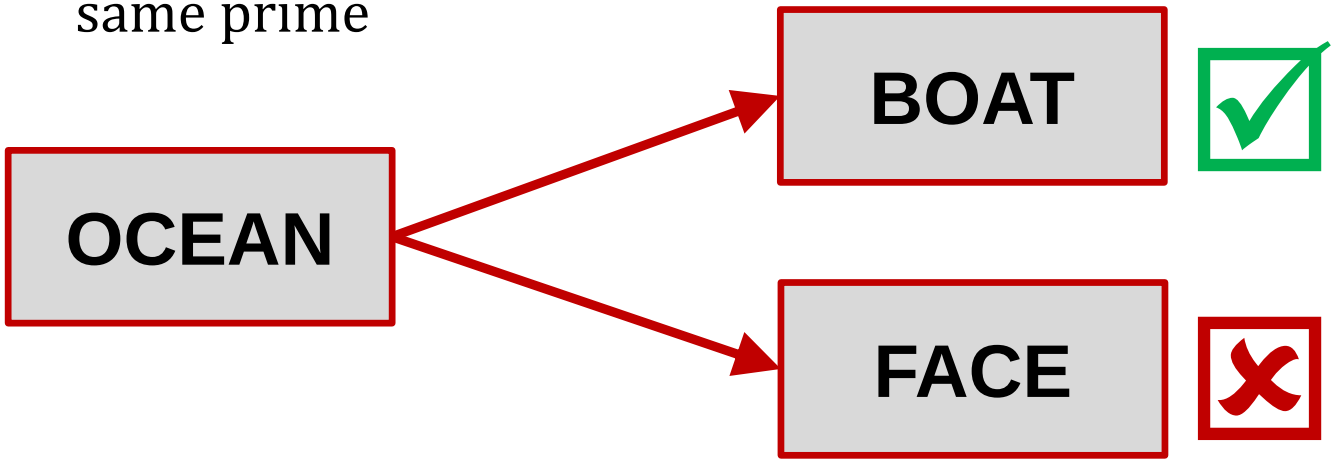
- When one stimulus *automatically* influences the processing of another stimulus
- Priming can influence perception even when a person is unaware of the priming stimulus
- Priming can act at many levels of representation
  - Response time faster if prime is perceptually similar to target, e.g. 'boat' primed with 'book' is faster than 'face' with same prime



Implicit Memory

Priming

- When one stimulus *automatically* influences the processing of another stimulus
- Priming can influence perception even when a person is unaware of the priming stimulus
- Priming can act at many levels of representation
  - Response time faster if prime is semantically related to target, e.g. 'boat' primed with 'ocean' is faster than 'face' with same prime

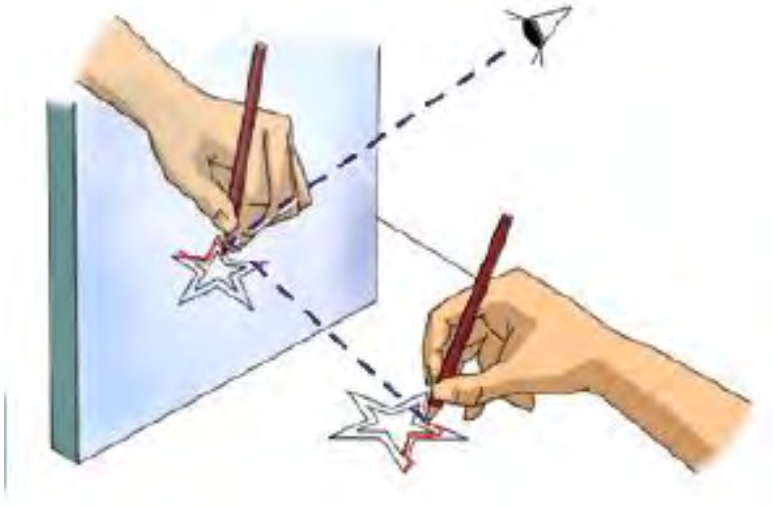


Long-term memory

Independence of implicit and explicit memory

- Amnesia patients with damaged explicit memory still show priming effects
- Amnesia patient C.W. can improve over time when playing a new piece of music without explicit recall
- H.M. was able to learn a mirror tracing task and improve over time without explicit recall





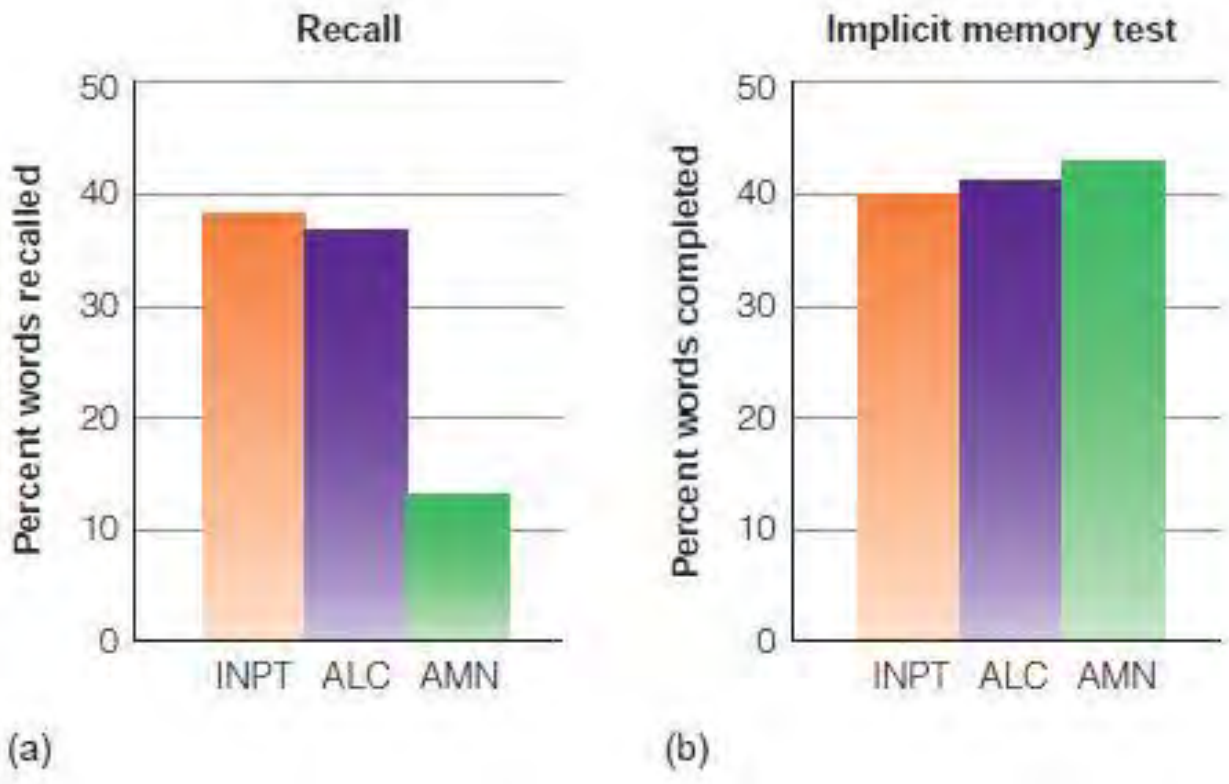
Long-term memory

Independence of implicit and explicit memory

- Implicit/explicit separation for amnesia patients
- Amnesia patients

Amnesic patients showed poor recall in memory study

Same subjects showed priming effects similar to controls



Graf, Shimamura, & Squire, 1985

Types of long-term memory

Comparing and Contrasting Episodic and Semantic Memory

Episodic Memory	Semantic Memory
Autobiographical: "I remember"	Factual: "I know"
Can be communicated flexibly—in a format other than that in which it was acquired	Can be communicated flexibly—in a format other than that in which it was acquired
Consciously accessible (you know that you know)	Consciously accessible (you know that you know)
Tagged with spatial and temporal context	Not necessarily tagged with a context
Learned in a single exposure	Can be learned in a single exposure, but can also be strengthened by repetition

Comparison of Memories for Skills, Events, and Facts

Skill Memory	Memory for Events and Facts
1. Is difficult to convey to others	1. Can be communicated flexibly
2. May be acquired without awareness	2. Has content that is consciously accessible
3. Requires several repetitions	3. Can be acquired in a single exposure

Hierarchical Semantic Organization

- Concepts are organized into categories. We use this knowledge to categorize newly encountered objects and events
- *But how are these concepts organized in long-term memory?*
- Hierarchical organization - early theories assumed information in memory is stored hierarchically.
    - Larger, more general categories (superordinate) are divided into smaller more specific categories (subordinate) creating multiple levels of categories

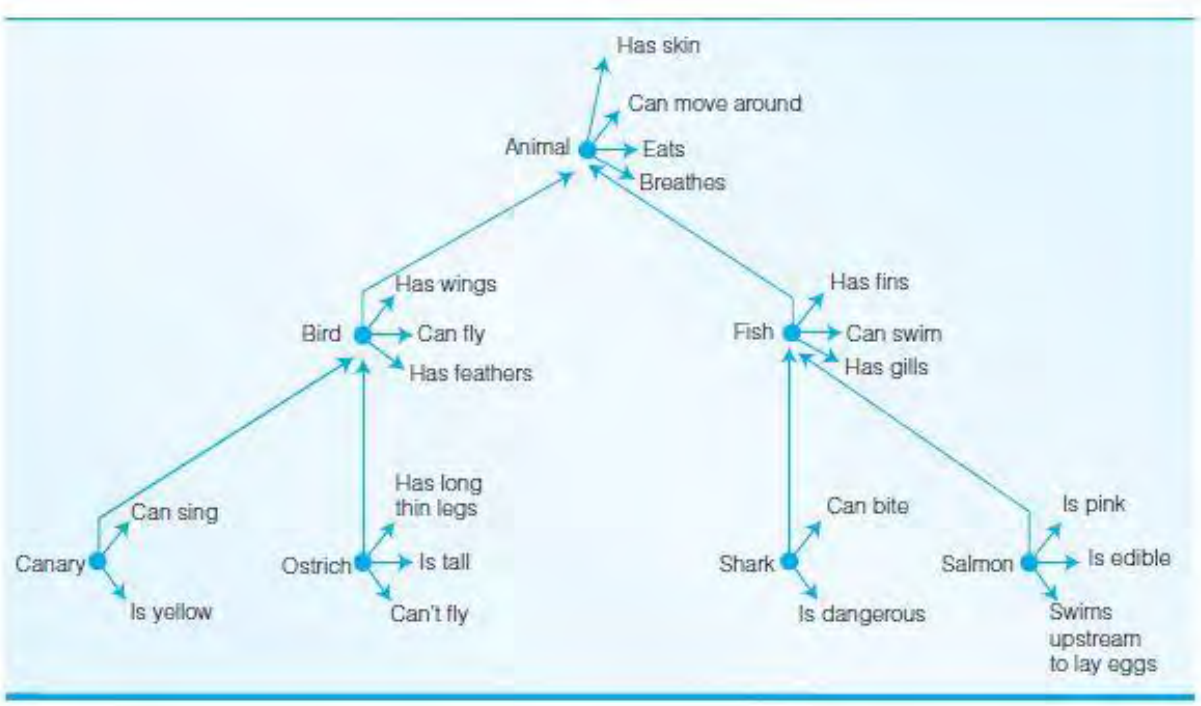


Hierarchical Semantic Organization

Hierarchical semantic network model

- Concepts and categories are organized hierarchically and arranged based on shared features
- Network of elements (called nodes) that correspond to concepts and their features

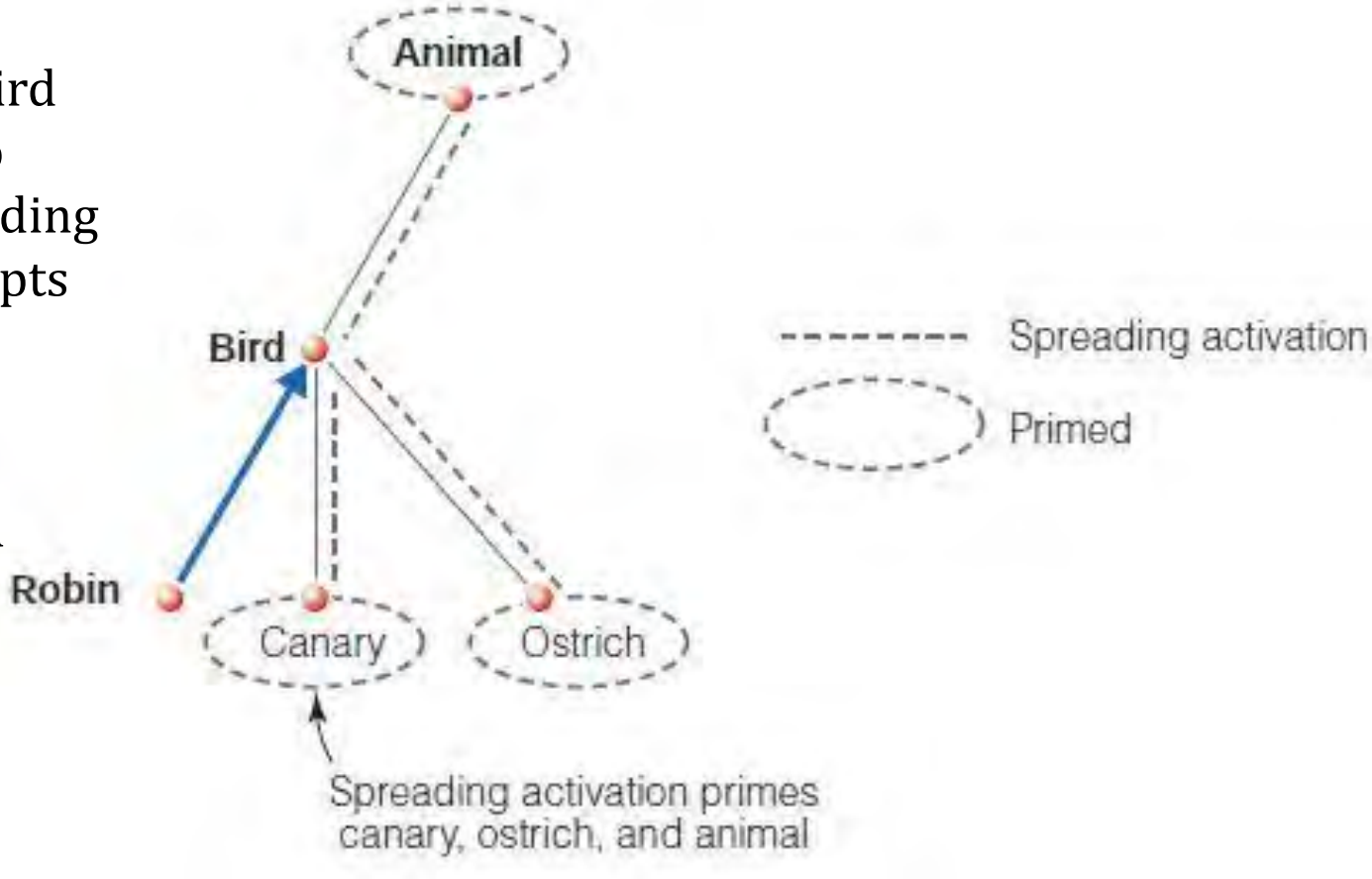
- Categories that share many semantic features are closer to one another



Hierarchical Semantic Organization

The activation of a concept in the semantic network should lead to "spreading activation" of similar concepts and semantic features.

- Activating the bird concept leads to activation spreading to related concepts (i.e. priming)
- Primed concepts should be retrieved from memory more quickly and easily



Errors in Judgment

Confirmation Bias

- Tendency to selectively look for information that conforms to our hypothesis and to overlook contrasting information
- Bias towards any information that confirms specific opinions, attitudes, hypotheses over alternatives.
- This type of bias affects how we interpret and gather evidence
- Can narrow focus only on confirming information rather than information that might falsify a theory, hypothesis, opinion or attitude.

Confirmation Bias

Wason's digit sequence task (1960)

- Your job is to find out which rule for the generation of number sequences the experimenter is thinking of.
- You will tell the experimenter a sequence and they will tell you whether it fits the rule. One example of a sequence that fits the rule is "2, 4, 6"
- Which sequence would you try next?
- Most subjects try sequences like *4,6,8* or *5,7,9* (increasing by *2*s), but tended not to try sequences that would disconfirm their initial hypothesis
- The actual rule is "**increasing numbers**" so any increasing list - "*1, 2, 3*" or "*700, 800, 999*" - would fit the rule just as well

Judgment Heuristics

Heuristics

- When reasoning or choosing among options, we can't consider every bit of relevant information
- To deal with these limitations we use strategies and mental shortcuts to lighten the cognitive load of reasoning and making judgments
- Heuristics can provide quick and easy solutions to many types of problems - "Fast and Frugal Heuristics" -Gigerenzer & Todd, 1999
- Heuristics also have broader influences on our reasoning – often they are very helpful, but they can also lead us to fallacies in reasoning

Availability Heuristic

- Events that are easily remembered are judged as being more probable
- People estimate probabilities based on how easily they can retrieve examples from memory
- *There is a long fantasy novel written for young adults (600 pages).*
- *Estimate how many words in the novel have 7 letters with the 6th letter being "n"*

____ ____ ____ ____ ____ *N* ____

Availability Heuristic

- Events that are easily remembered are judged as being more probable
- People estimate probabilities based on how easily they can retrieve examples from memory
- *There is a long fantasy novel written for young adults (600 pages).*
- *Estimate how many words in the novel have 7 letters with the last 3 letters being "ing"*

____ ____ ____ ____ I N G

Availability Heuristic

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- People estimate probabilities based on how easily they can retrieve examples from memory
- *There is a long fantasy novel written for young adults (600 pages).*
- *Estimate how many words in the novel have 7 letters with the last 3 letters being "ing"*

____ ____ ____ ____ I N G

Words ending in '-ing' are much easier to retrieve from memory than 7-letter words with the letter 'n'
but there **cannot** be more "____ing" than "_____n_" words

Which cause of death is more likely?

	More likely cause on left		Subjects accuracy selecting more likely cause of death
20x more likely	Homicide	Appendicitis	91%
5x more likely	Drowning	Train collision	66%
20x more likely	Asthma	Tornado	42%
920x more likely	Asthma	Botulism	59%
2x more likely	Appendicitis	Pregnancy	17%

Lichtenstein et al., 1978

Availability Heuristic

- Events that are easily remembered are judged as being more probable
- Rare or strange events can capture our attention and stand out in memory. The likelihood of such events will tend to be overestimated
- People estimate probabilities based on how easily they can retrieve examples from memory
    - *Diabetes and heart disease deaths are not uncommon, but neither are they widely publicized*…
    - *The true probability of a plane crash is overestimated*

Availability Heuristic

Illusory correlation

- Belief in a strong relationship between two events or characteristics, when no correlation exists
- Strong correlation between two events *appears to exist*, but in reality there is *no correlation*, or it is *weaker than it appears*
  - I wore this shirt and they won the game, this is my lucky shirt.
  - I don't get pulled over when I drive in the right lane.
  - I met an *X* and she was very mean… now I don't like *X*s.
- When we expect two things to be related, illusory correlations are more likely to be perceived
- This type of bias is particularly strong when characteristics determine social categories

Developmental Psychology Comprehensive Exam: Study Guide and Practice Questions

What the exam covers

The developmental psychology section has 20 multiple-choice questions drawn from three class periods. Most questions describe a short scenario and ask you to apply a concept, so knowing definitions is not enough. Practice recognizing each idea in a real-life example.

Class period	Topics
1. Prenatal development and the developing brain	Teratogens, critical periods, synaptic pruning, adverse childhood experiences and trauma
2. Cognitive development in context	Piaget, Vygotsky, Bronfenbrenner's ecological systems
3. Socioemotional development	Erikson's identity stage, Marcia's identity statuses, attachment theory

How to study

- Review the class slides alongside this guide.
- For each key term, write your own everyday example.
- Try the five practice questions before checking the answers.
- Explain each theory out loud to a classmate in two sentences.

Prenatal development and the developing brain

Stages of prenatal development

Stage	Timing	What happens
Germinal	Conception to week 2	Zygote divides and implants in the uterine wall
Embryonic	Weeks 3–8	Neural tube, heart, and major organs form; most vulnerable period for structural defects
Fetal	Week 9 to birth	Organs mature and the body grows rapidly; the brain keeps developing throughout

Teratogens

- **Teratogen:** any agent that can harm prenatal development, such as alcohol, nicotine, opioids, some medications, infections (rubella, Zika), toxins (lead), and chronic maternal stress.
- **Effects depend on** timing, dose, and genetic susceptibility.
- **Alcohol:** no amount is known to be safe at any point in pregnancy. It can cause fetal alcohol spectrum disorders (FASD).

The developing brain

- **Synaptogenesis:** rapid growth of connections between neurons in the first years of life.
- **Synaptic pruning:** unused connections are removed and used ones are strengthened ("use it or lose it"). This makes the brain more efficient.
- **Enriched environments:** rats raised with toys and companions grew more cortex than rats raised alone, showing that experience shapes the brain.

Adverse childhood experiences (ACEs) and trauma

- **ACEs** include abuse, neglect, household violence, parental incarceration, and household substance use or mental illness.
- **Toxic stress:** prolonged stress without a supportive adult to buffer it can disrupt brain areas for attention, memory, and emotion regulation.
- **Dose-response:** more ACEs are linked to higher risk of later physical and mental health problems.
- **Not destiny:** caring adults, stable routines, and community support protect children and change outcomes.

Cognitive development in context

Piaget's building blocks

- **Schema:** a mental framework for organizing knowledge.
- **Assimilation:** fitting new experiences into an existing schema (a toddler calls a cow "doggie").
- **Accommodation:** changing a schema to fit new information (the toddler learns "cow").

Piaget's four stages

Stage	Approx. age	Key achievements and limits
Sensorimotor	Birth–2	Learns through senses and actions; develops object permanence
Preoperational	2–7	Uses symbols and pretend play; egocentric; lacks conservation
Concrete operational	7–11	Thinks logically about concrete events; masters conservation
Formal operational	12+	Reasons abstractly and about hypothetical situations

Vygotsky's sociocultural theory

- **Zone of proximal development (ZPD):** tasks a child can do with help but not yet alone.
- **Scaffolding:** support from a more skilled person that fades as the child gains skill.
- **Private speech:** children talk to themselves to guide their actions; it later becomes inner thought.
- **Culture and community** (parents, siblings, elders, teachers) shape how children think.

Bronfenbrenner's ecological systems theory

System	Definition	Example
Microsystem	Direct, face-to-face settings	Family, classroom, church, friends
Mesosystem	Connections between microsystems	Parent-teacher conferences
Exosystem	Settings that affect the child indirectly	A parent's workplace
Macrosystem	Culture, laws, values, economic systems	Structural racism, housing policy
Chronosystem	Change over time	A pandemic, a divorce, historical events

Tip: ask "Is the child directly in this setting?" If not, it is probably the exosystem or macrosystem.

Socioemotional development

Erikson's identity stage

- Erikson proposed eight psychosocial stages, each centered on a conflict.
- **Identity vs. role confusion (about ages 12–18):** adolescents explore values, roles, and goals to build a stable sense of self. Trying on different styles, friends, and interests is a normal part of this stage.
- A positive resolution leads to **fidelity**, being true to oneself and one's commitments.

Marcia's identity statuses (exploration × commitment)

Status	Explored?	Committed?	Example
Identity achievement	Yes	Yes	Explored several careers, then chose one
Moratorium	Yes, actively	Not yet	Taking classes in three majors, still deciding
Foreclosure	No	Yes	Follows the family's plan without considering others
Diffusion	No	No	Not exploring and not committed to anything

Attachment theory

- **Harlow:** infant monkeys preferred a soft cloth "mother" over a wire one that gave milk. Comfort, not food, drives attachment.
- **Bowlby:** attachment is an evolved system; a caregiver serves as a **secure base** for exploring.
- **Ainsworth's Strange Situation** measures attachment through separations and reunions:

Style	What you see at reunion
Secure	Seeks the caregiver and is quickly comforted
Avoidant	Ignores or avoids the caregiver

Style	What you see at reunion
Resistant (ambivalent)	Seeks contact but resists it; hard to soothe
Disorganized	Confused or frozen behavior; linked to frightening or maltreating care

Culture matters: in many families, including many Black families, grandparents and extended kin share caregiving. Children can form secure attachments to several caregivers.

Five practice questions

These questions match the style of the exam. Try them before checking the answers below.

1. A child who lived in an orphanage with very little interaction for her first two years shows delays in language and social skills. Which concept best explains why early experience matters so much?

A. Assimilation
B. Foreclosure
C. Synaptic pruning
D. The germinal period

2. A 7-month-old watches a toy get covered by a blanket and immediately reaches under the blanket to find it. This shows the infant has developed:

A. Object permanence
B. Conservation
C. Formal operations
D. Private speech

3. Children who were 8 years old during the COVID-19 school closures may show different long-term effects than children who were 16. In Bronfenbrenner's model, this reflects the:

A. Microsystem
B. Mesosystem
C. Exosystem
D. Chronosystem

4. Tyler, 19, has not thought about a career or his values and says, "I don't really care; whatever happens, happens." In Marcia's model, Tyler is in:

A. Identity achievement
B. Identity diffusion
C. Identity moratorium
D. Identity foreclosure

5. In the Strange Situation, an infant shows little distress when the caregiver leaves and turns away when the caregiver returns. This infant shows which attachment style?

A. Avoidant
B. Secure
C. Resistant (ambivalent)
D. Disorganized

Practice answers with explanations

#	Answer	Why
1	C	The brain overproduces connections early, then prunes those that aren't used. Severe deprivation during sensitive periods means important connections are lost.
2	A	Searching for a hidden toy shows the infant knows objects still exist when out of sight, a sensorimotor milestone.
3	D	The chronosystem captures how the timing of events, such as a pandemic at different ages, shapes development.
4	B	Tyler is neither exploring nor committed, which is identity diffusion.
5	A	Little distress at separation and avoiding the caregiver at reunion define avoidant attachment.

Neuropsychology

Study Guide

Prefrontal Cortex and Executive Functions

WHAT IS PREFRONTAL CORTEX?

- Prefrontal cortex is cortical region targeted by the medial-dorsal thalamic nucleus.
- Located in the anterior portion of frontal lobes; anterior to primary and secondary motor areas
- It is association cortex because it does not receive a direct connection from sensory and motor nuclei in the thalamus
- Responsible for executive functions (EF)
- EF use perceptions, knowledge, and goals to bias behavior from a multitude of possibilities
- EFs allow to override habitual responses.
- EF involve decision making, planning, reasoning, creativity, self-monitoring and goal-directed behavior (inhibition and activation)

Prefrontal control systems

- **Lateral prefrontal cortex-** supports goal-oriented behavior: initiating, inhibiting and shifting behavior; simulating consequences; anticipation; working memory-system that actively holds multiple pieces of transitory information in the mind, where they can be manipulated; form abstract concepts, rules and principles
- **Orbital and medial prefrontal cortex-** supports guiding and monitoring behavior; The orbital and medial prefrontal cortex links emotional experience with rational evaluation. This integration:

• Reduces impulsive behavior

• Favors long-term goals over short-term rewards

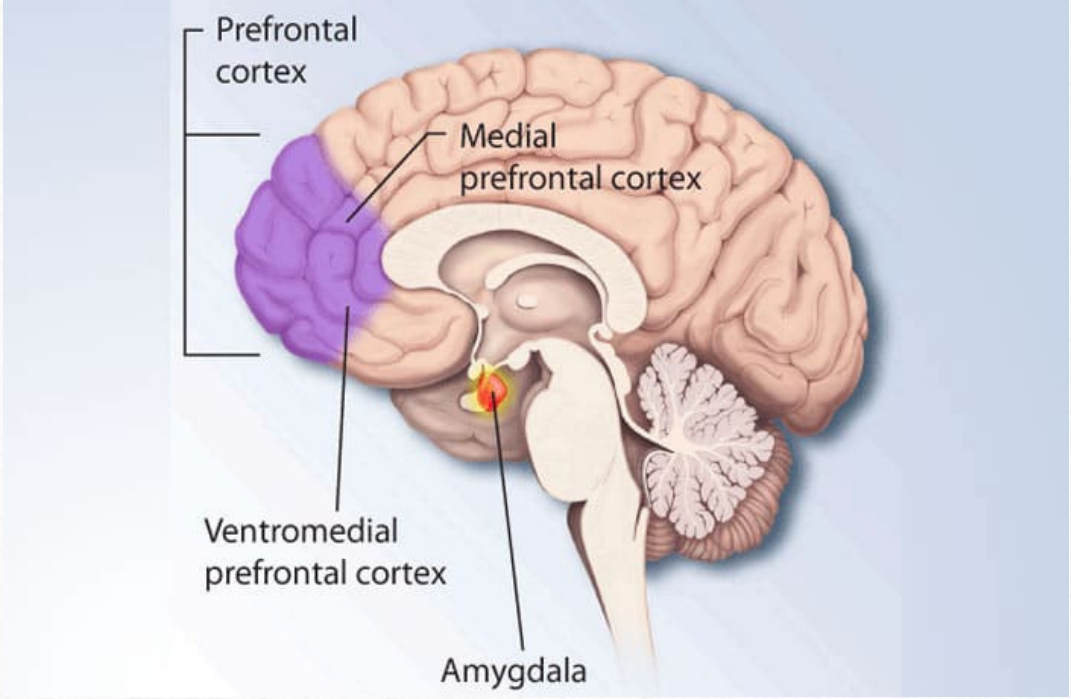
• Improves decisions under risk and uncertainty

• Supports future-oriented planning

Subdivisions of Prefrontal Cortex

- Four subdivisions: lateral prefrontal cortex, ventromedial, frontal pole, and medial frontal cortex

Medial Prefrontal Cortex



Prefrontal Cortex: Lateral, Medial and Ventral View

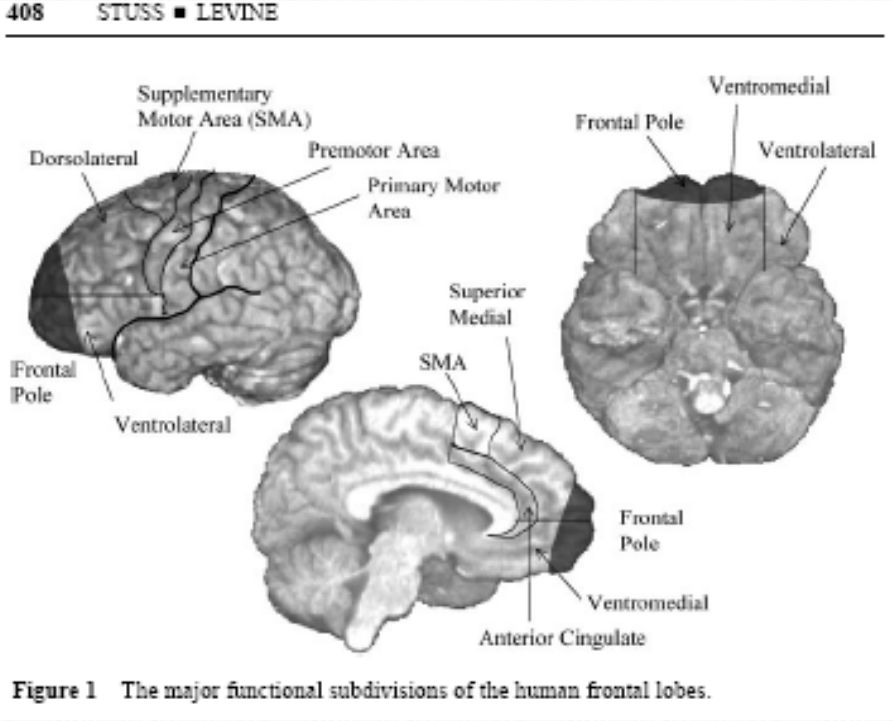


Figure 1 The major functional subdivisions of the human frontal lobes.

Prefrontal Cortex: Input and Output Pathways

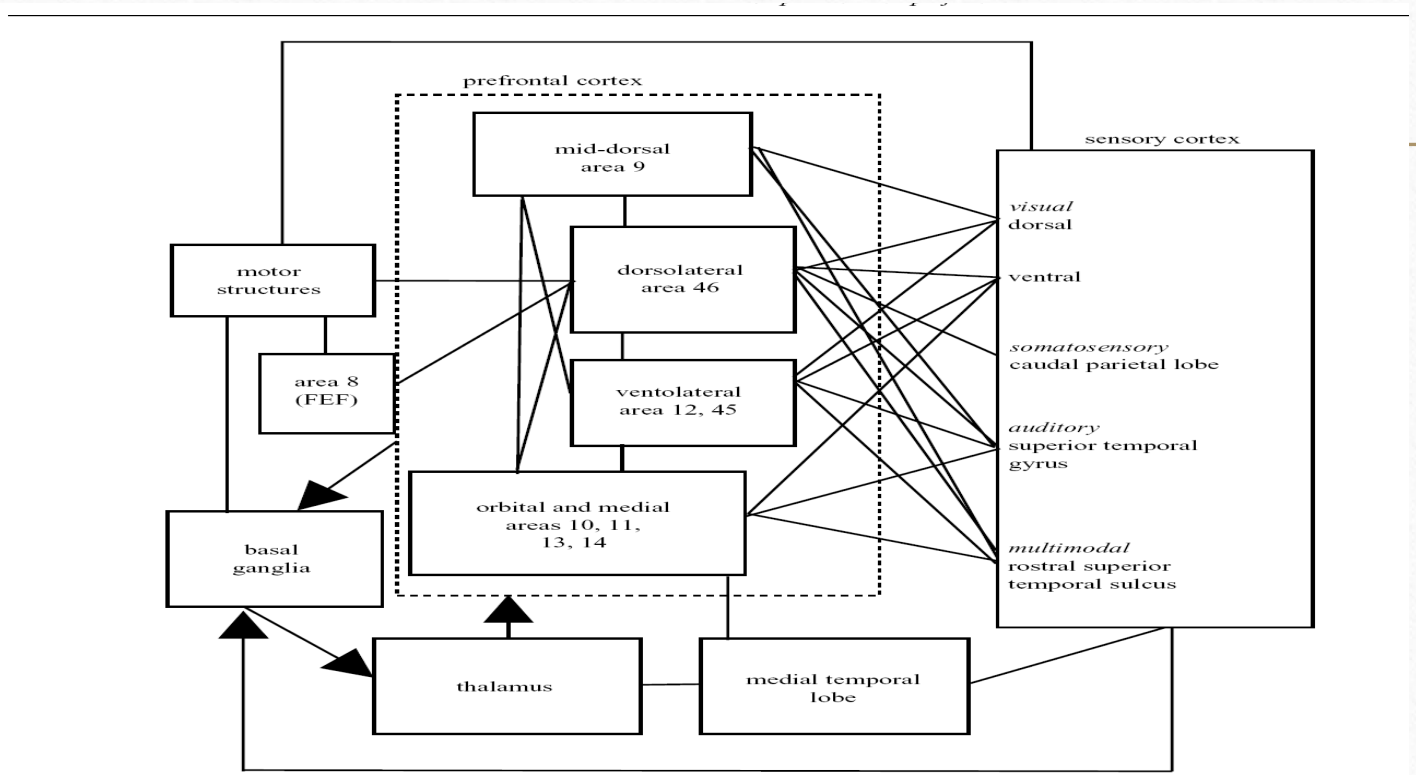


Figure 2. Schematic diagram of extrinsic and intrinsic connections of the PFC. Most connections are reciprocal; the exceptions are noted by arrows. From Miller & Cohen (2001).

Bottom-Up Processing

- Automatic behaviors can be thought of as relying primarily on "bottom-up" processing
- Old habits of thought or action (conditioned responses), and/or exogenous stimuli in the environment that pull us this way or that, automatic, stimulus-driven, or involuntary attention and is driven by properties of stimuli themselves
- Determined largely by the nature of the sensory stimuli and well-established neural pathways that connect these with corresponding responses.

Prefrontal Cortex and Top-Down Processing

- PFC is important when "top-down" processing is needed
- When behavior must be guided by internal states or intentions,
- The PFC is critical in situations when the mappings between sensory inputs, thoughts, and actions either are weakly established relative to other existing ones or are rapidly changing.
- This is when we need to use the "rules of the game," internal representations of goals and the means to achieve them.
- Another aspect of interference control is suppressing prepotent mental representations (cognitive inhibition).

Social Psychology

Practice Questions and Study Guide

Social Psychology Practice Questions (correct answer is in bold):

1. In the Rosenthal and Jacobson (1968) Pygmalion study, the self-fulfilling prophecy occurred because:
   A. Students changed their own intelligence levels through sheer willpower.
   B. Teachers' expectations led them to act in ways that made those expectations come true.
   C. The schemas of the teachers were entirely disregarded by the students and administrators.
   D. Random assignment failed to create equal groups of students at the start of the study.

2. According to research by Miller (1984), at what age do cultural differences in attributional styles typically begin to emerge?
   A. Around 5 years old.
   B. Around 10 years old.
   C. Around 15 years old.
   D. Around 25 years old.

3. Schemas provide structure in ambiguous settings. How does the active schema influence the interpretation of an individual being unhappy with the amount of alcohol at a party?
   A. A rock star schema leads to an interpretation of disappointment, while a nun schema leads to an interpretation of disapproval.
   B. Both schemas lead to an interpretation of a personal lack of self-control.
   C. The behavior is only noticed if the observer has a collectivist cultural background.
   D. The schema ensures that the observer ignores the behavior entirely to save mental effort.

4. In the scenario involving Melissa Jones at Company Orange, many people predict she is an office worker despite the high probability she is a programmer. This occurs because they:
   A. Ignore the base rate and rely on the representativeness heuristic.
   B. Use the availability heuristic based on highly publicized news reports.
   C. Make a situational attribution for her touch-typing behavior.
   D. Engage in a highly effortful and controlled correction process.

CH04 PERCEIVING PERSONS: SOCIAL COGNITION

DEFINITIONS

Cognition
how people perceive, remember and interpret information.

Social Cognition
how people perceive, remember and interpret information *about people.*

DIFFERENCES BETWEEN COGNITION

&

SOCIAL COGNITION?







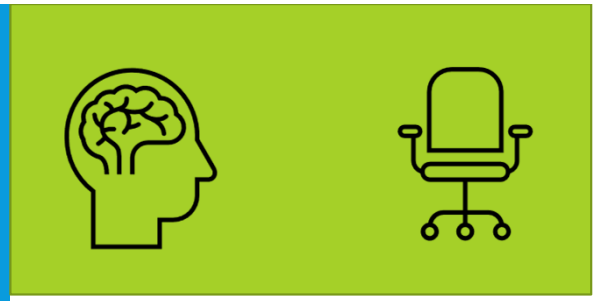




DIFFERENCES BETWEEN COGNITION

&

SOCIAL COGNITION?





1. People perceive back
2. People react to being perceived
3. People are likely to change over time
4. People are more complex than objects
5. People's crucial features are usually unobservable

SOURCES OF INFORMATION ABOUT OTHERS?

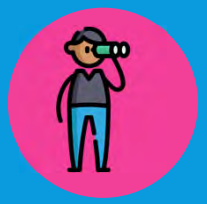
SOURCES OF INFORMATION ABOUT OTHERS?



NON-VERBAL BEHAVIOR



VERBAL BEHAVIOR



APPEARANCE



GROUP IDENTITIES

flaticon.com

DEFINITION

Schemas: Mental structures people use to organize their knowledge.

Schemas impact perception, attention, and memory.

TYPES OF SCHEMAS

Self-schemas: contain information about the self (books in your self-concept library).

Person Schemas: contain understanding of attributes of particular individuals (stereotypes, roles, personality types…).

Event Schemas: contain information about what happens in a particular setting or situation (scripts).

SCRIPT OF A PLAYGROUND FIGHT?



1st

2nd

3rd

4th

5th

6th

7th

8th

SCRIPT OF DINNER DATE?



1st

2nd

3rd

4th

5th

6th

7th

8th

SCHEMAS INFLUENCE PERCEPTION



SCHEMAS INFLUENCE PERCEPTION



bird

SCHEMAS INFLUENCE PERCEPTION





bird

What traits are in the schema?

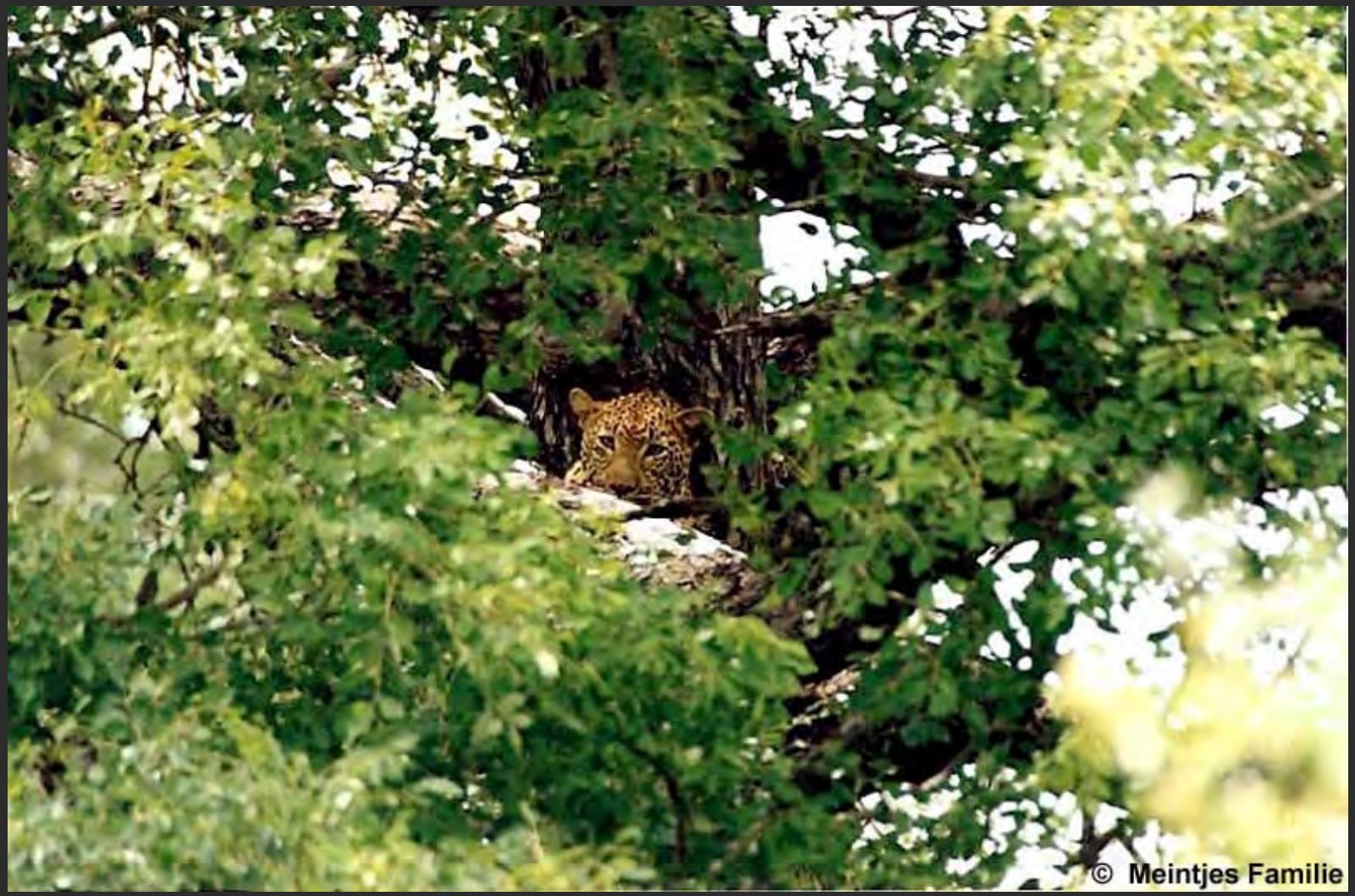








SCHEMAS INFLUENCE ATTENTION


© Meintjes Familie



https://susielovesphotography.com/

IMPACT OF SCHEMAS:

1. Influence perception: top-down processing
2. Direct attention: to what is important to survival
3. Guide recall: helps you recall information
   - Recall better for schema consistent information.
   - Can even recall schema consistent events that did not occur.

SCHEMAS: STRENGTHS

1. Increase ability to understand people and events.

2. Provide structure in ambiguous settings.

The rock star was unhappy with the amount of alcohol at the party. (now try nun)

SCHEMA: WEAKNESSES. WRONG IN INDIVIDUAL CASES.



Nuns drinking beers.

SCHEMAS: WEAKNESSES

1. Can distort what you see and remember.

2. Schemas can persist even after being discredited.

3. People can make their schemas come true (self-fulfilling prophecy).

   Pygmalion Study (Rosenthal & Jacobson, 1968)

DEFINITION

Heuristics

Mental shortcuts people use to make judgments quickly and efficiently.

AVAILABILITY HEURISTIC



DEFINITION

Heuristics

Mental shortcuts people use to make judgments quickly and efficiently.

Availability Heuristic

The tendency to estimate the likelihood that an event will occur by how easily instances of it come to mind.

Example: Instances of winning the lottery come to mind more easily, because they are more highly publicized than deaths due to smoking.

In company Orange, a computer software firm, there are 20 office staff (administration, secretarial, and sales) and 80 programmers/analysts. Melissa Jones works for company Orange. She is a tall attractive woman, age 28. She knows how to touch type, communicates well with people, and loves her job. Her hobbies are crossword puzzles, painting, and dancing. What is the likelihood that Melissa is a programmer/analyst? (Choose one)

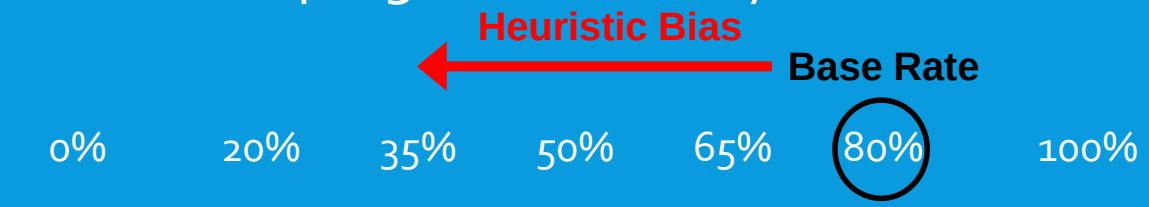
0% 20% 35% 50% 65% 80% 100%



REPRESENTATIVENESS HEURISTIC

In company Orange, a computer software firm, there are 20 office staff (administration, secretarial, and sales) and 80 programmers/analysts. Melissa Jones works for company Orange. She is a tall attractive woman, age 28. She knows how to touch type, communicates well with people, and loves her job. Her hobbies are crossword puzzles, painting, and dancing. What is the likelihood that Melissa is a programmer/analyst? (Choose one)





DEFINITION

Representativeness Heuristic
classifying objects according to how similar or representative they are to the typical case.

(ex. Melissa was more similar to the stereotype of office staff than programmer/analysts)



LEFT SIDE

RFKO
PCU
KFNIE
OPOSN
EATLP

RIGHT SIDE

ESOR
FELA
TSME
RFLWEO
EATLP

LEFT SIDE

RFKO	FORK
PCU	CUP
KFNIE	KNIFE
OPOSN	SPOON
EATLP	_____

RIGHT SIDE

ESOR	ROSE
FELA	LEAF
TSME	STEM
RFLWEO	FLOWER
EATLP	_____

LEFT SIDE

	PRIMES
RFKO	FORK
PCU	CUP
KFNIE	KNIFE
OPOSN	SPOON
EATLP	**PLATE**

RIGHT SIDE

	PRIMES
ESOR	ROSE
FELA	LEAF
TSME	STEM
RFLWEO	FLOWER
EATLP	**PETAL**

Response	Place Setting Prime	Flowering Plant Prime
Plate		
Petal		
Other		

DEFINITION

Priming

Tendency for recently used words or ideas to come to mind easily and influence interpretation of new information, judgments, and behavior automatically.

POLITICIANS AND PRIMING ASSOCIATIONS









POLITICIANS AND PRIMING ASSOCIATIONS







Democrats reclaim the American flag

Ambitious Democrats are leaning on their credentials as veterans to draw a contrast with Republicans.

Rep. Pat Ryan (D-N.Y.) handed out small flags on Capitol Hill with the message: "Patriotism does not belong to one party." | Mary Altaffer/AP

By ADAM WREN



YouTube

Priming in Focus

Will Smith
Margot Robbie





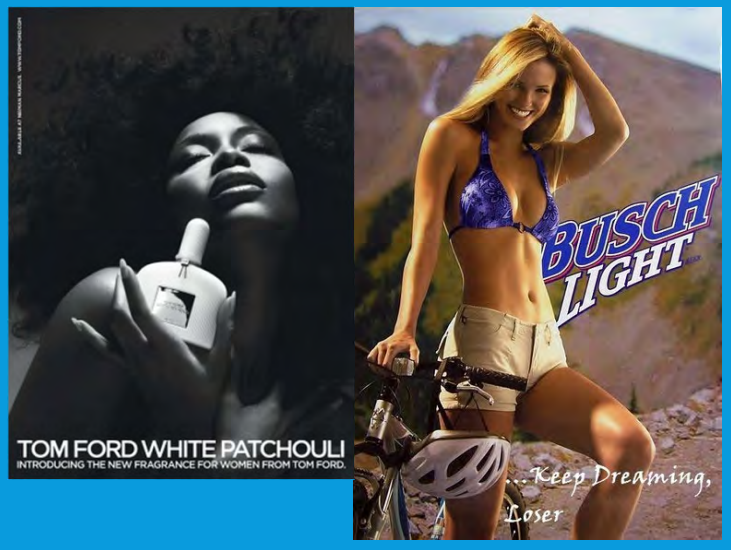


PRIMING AND BEHAVIOR:
RUDMAN AND BORGIDA (1995)

Male Participants

Manipulation: randomly assigned to see sexy or motherly women commercials

Group A: sexy women



Group B: motherly women



PRIMING AND BEHAVIOR:
RUDMAN AND BORGIDA (1995)

Male Participants, viewed a TV show rated it.

Manipulation (independent variable)

- Group A: sexy women portrayed in commercials
- Group B: motherly women portrayed in commercials

Men interviewed female applicants (dependent variable):

- Group A showed more sexist behavior and interview judgments than Group B.

DIALECTIC

AUTOMATIC VS. CONTROLLED PROCESSES

Automatic Process
-Unconscious
-Unintentional
-Effortless

More likely when:
1. Unmotivated or unable to think
2. When an action is easy or well practiced

Controlled Process:
-Conscious
-Intentional
-Effortful

Controlled is more likely when:
1. Motivated and able to think
2. When an action is difficult or new

AUTOMATIC VS. CONTROLLED PROCESSES

Automatic:

- reading now
- driving now
- saying #'s in numerical order
  - (1,2,3,4,5)

Low motivation/ability to think

Controlled:

- reading as child
- learner's permit
- saying #'s in alphabetic order
  - (eight, five, four, nine…)

High motivation/ability to think

THE END

Attribution

explanations for behavior







Situational Attributions	Personal Attributions

Why make attributions of Professor’s behavior?

Why make attributions of behavior?

1. Understand causes in general
2. Predict future behavior
3. Control/influence future behavior

Attribution Theory

Attribution Theory: theory that describe how people explain the causes of behavior.

Theory I: Heider (1958)



Amateur scientists: make attributions out of a motivation to understand things.



Two types of attribution for a behavior:

1. Personal: ability, personality, choice
2. Situational: task, luck, other people

Theory II: Correspondent Inference Theory



Jones & Davis (1965)

3 factors determine situation/personal attribution for behavior

1. Choice: Did they have free choice of the behavior?
2. Expectedness: How surprising given situation?
3. Consequences: Are they mostly (+) or (-)?

Correspondent Inference Theory

No Choice→implies situational
Choice→implies personal

Expected→situational
Unexpected→personal

(+) consequences→situational
(-) consequences→personal



Behavior: Professor yells at students on first day of class.

Choice?

Expected?

Desirable

Consequences?



Behavior: Professor yells at students on first day of class.

Choice?	YES	(personal)
Expected?	NO	(personal)
Desirable	NO	(personal)
Consequences?		

Behavior:
an individual soldier keeps marching



Choice?
Expected?
Desirable
Consequences?

Behavior:
an individual soldier keeps marching



Choice? NO (situational)
Expected? YES (situational)
Desirable YES (situational)
Consequences?

Correspondent Inference Theory

Would most people do the same thing in the same situation?

If yes → situational attribution

If no → personal attribution

Quizmaster Study (Ross et al., 1977)



Manipulation (IV)

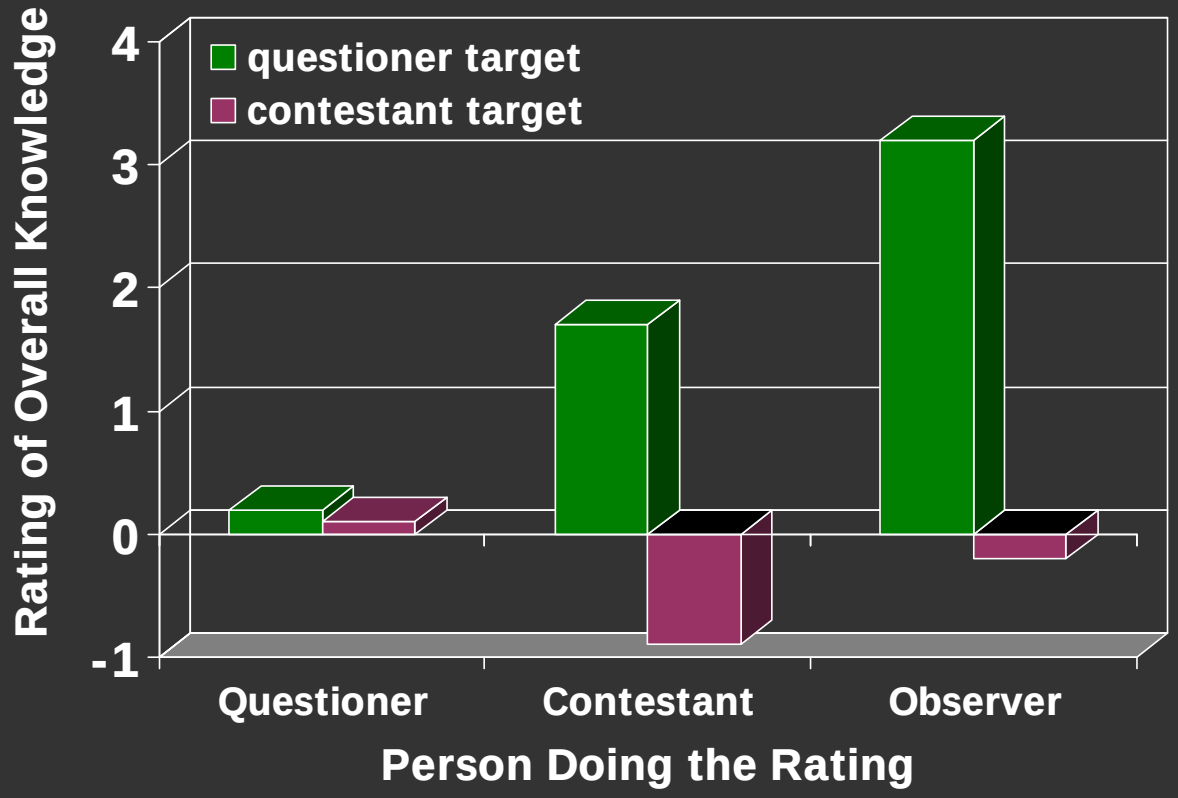
Group A: questioner, develops test items they know the answer to

Group B: contestant tries to answer

Measure (DV)

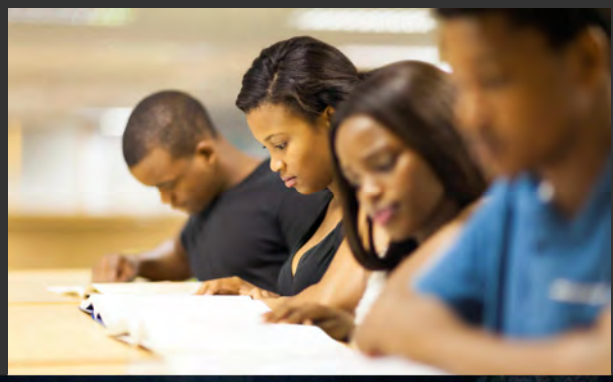
Ratings of general knowledge for questioner and contestant.

Quizmaster Study (Ross et al., 1977)



Fundamental Attribution Error (FAE)

FAE: Tendency to focus on personal causes and underestimate situational causes of *other's* behavior.



► Only see students in class (situation), the error is to assume they are a **conscientious person**.

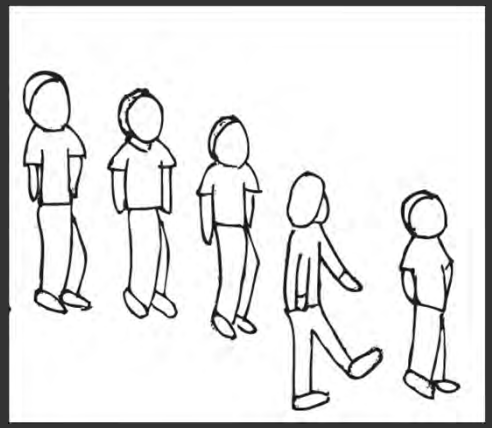
► Only see "party friend" out on the town (situation), the error is to assume they are a **party person**.



Theory III: Gilbert & Malone (1995)

Automatic

Behavior
Frowning man pushes past you to get an airplane ticket.



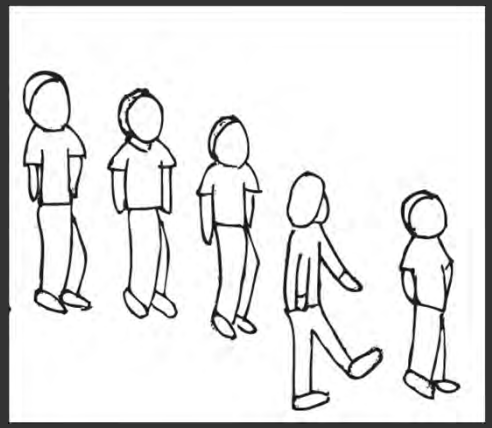
Theory III: Gilbert & Malone (1995)

Automatic

Behavior
Frowning man pushes past you to get an airplane ticket.

→

Personal Attribution
Man is rude



Theory III: Gilbert & Malone (1995)

Automatic | **Controlled**

Behavior
Frowning man pushes past you to get an airplane ticket.

→ **Personal Attribution**
Man is rude

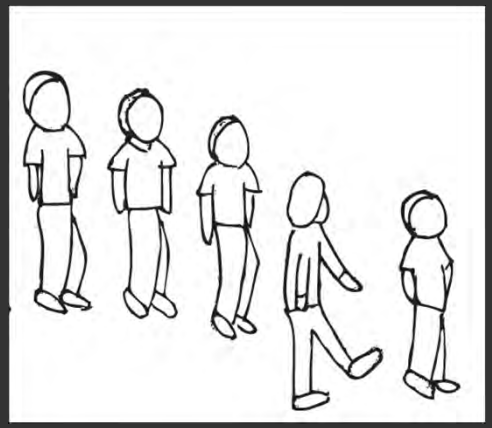
+/-

Situational Attribution
You learn the man is going to his mother's death bed.

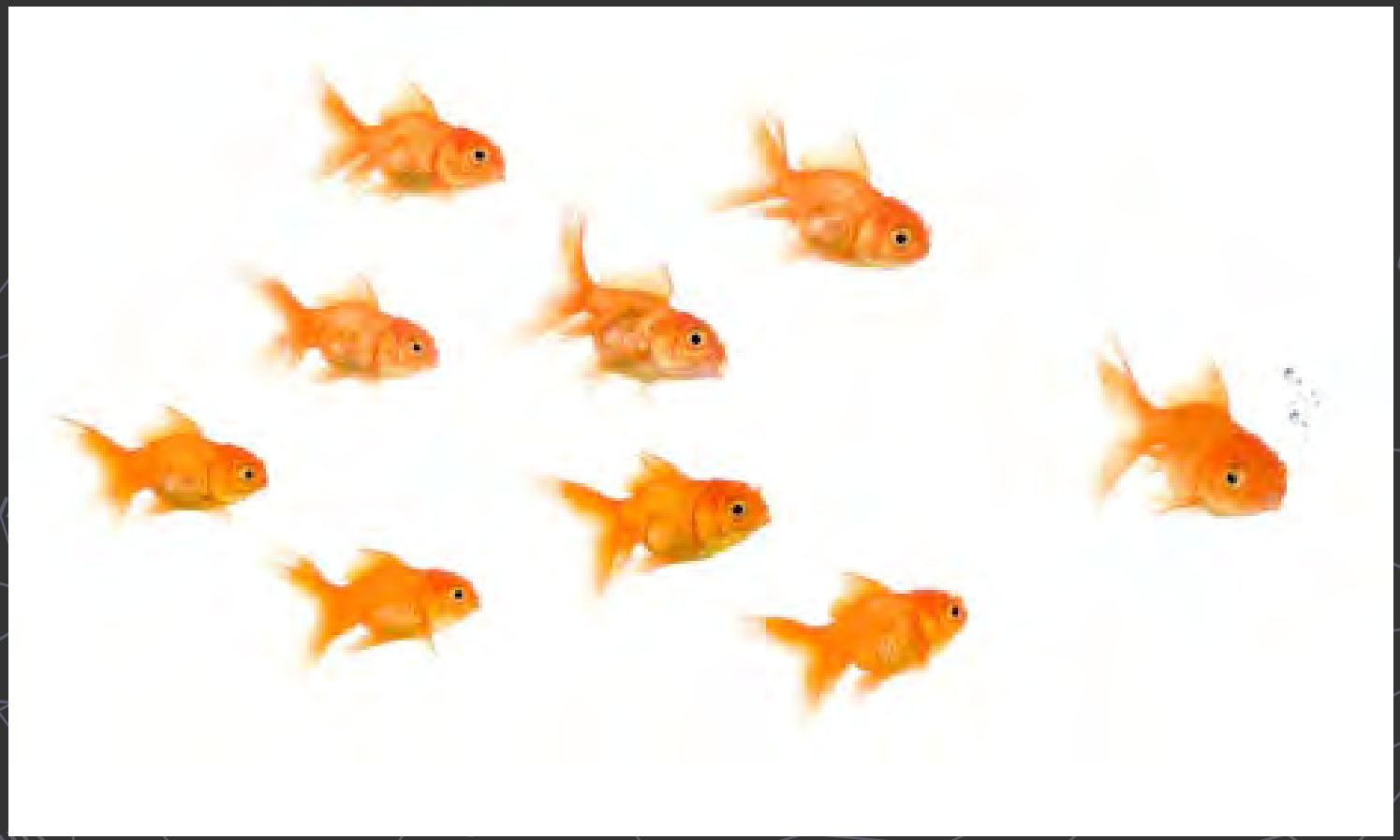
→ **Attribution**

Effort→Situational
(Mother's death bed)

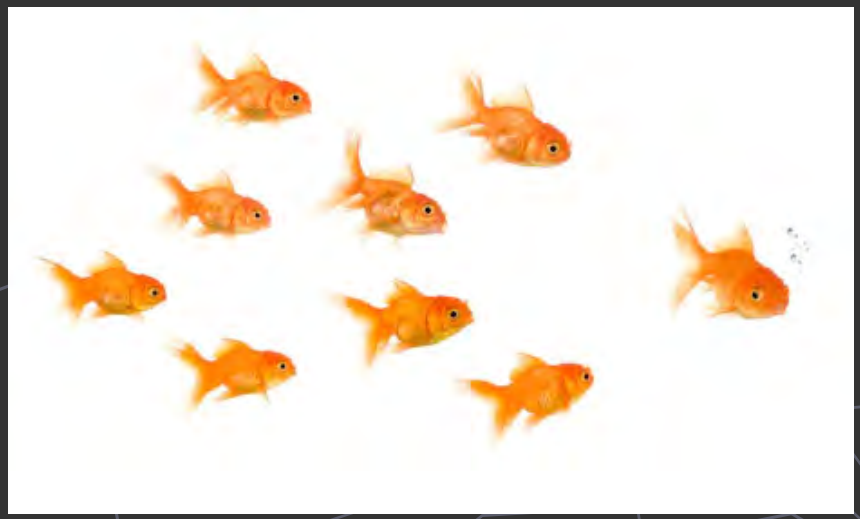
No effort→Personal
(Man is rude)



So, if not motivated or able to process, you make a personal attribution. That explains the Fundamental Attribution Error.



Why is the one fish apart from the others?



Personal Attribution	Situational Attribution

Cultural Differences



Westerners or individualists:
people are autonomous, motivated by internal forces.
(see fish as leader of other fish)

Nonwesterners or collectivists:
holistic view focused on relationships between individuals and their surroundings.
(see fish as chased away by other fish who make up the surroundings)

So, is Fundamental Attribution Error universal?

Cultural Differences



Why did the kid who's trying to lose weight eat a piece of pie when with his friends in the school cafeteria?

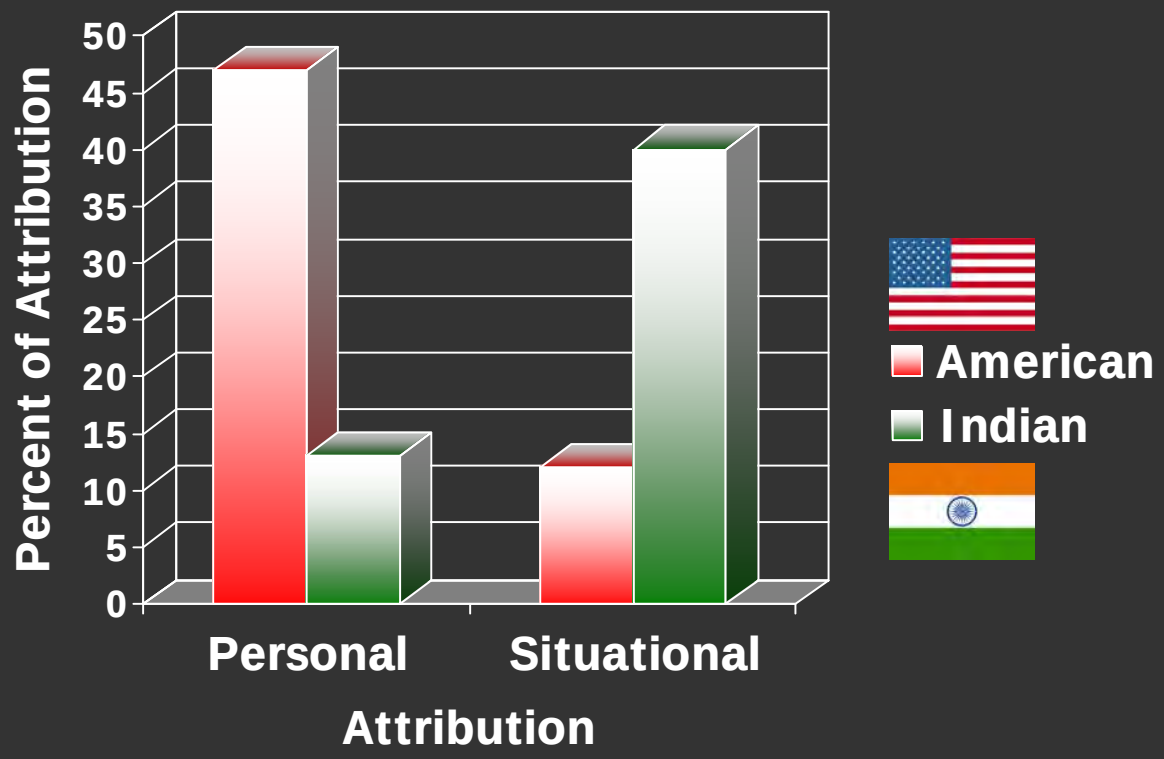
Individualist (Western) chooses personal attribution: lack of self-control, he is a lover of cake.

Collectivist (Non-western) chooses situational attribution: peer pressure because his friends were eating cake.

Cultural Differences (Miller, 1984)

Cultural difference appears around 15 years old.

Fundamental Attribution Error is not universal!




THE END

Statistics 1 (PSYC 003) Study Guide

Core Conceptual Directives & Learning Objectives for Exam Preparation

> **How to Use This Study Guide:** This study guide outlines the key concepts, definitions, analytical skills, and mathematical relationships required for the Statistics 1 exam. Use these study items to review theoretical foundations, practice calculation procedures, and test your understanding of core statistical logic.

1. Research Design, Measurement & Variable Types

- **Scales of Measurement:** Understand the defining characteristics of nominal, ordinal, interval, and ratio scales. Be able to categorize operational variables based on whether they possess equal intervals, meaningful ordering, or an absolute zero.
- **Independent vs. Dependent Variables:** Practice identifying manipulated independent variables (IVs) and measured outcome dependent variables (DVs) within experimental and observational research scenarios.
- **Discrete vs. Continuous Variables:** Distinguish between variables that consist of separate, countable whole units (discrete) versus those that can assume an infinite number of intermediate fractional values along a numerical continuum (continuous).
- **Confounding Variables & Experimental Control:** Understand how extraneous confounding variables provide competing explanations for observed results, and review how random assignment and experimental control isolate causal relationships.
- **Population Parameters vs. Sample Statistics:** Know the conceptual and notation distinctions between numerical values that describe entire populations (parameters like μ and σ) versus those computed from sample data (statistics like M, s, and s^2).

2. Descriptive Statistics, Distribution Shapes & Dispersion

- **Distribution Skewness & Central Tendency:** Understand how positive and negative skew alter the relative positions of the mean, median, and mode. Know when the median and interquartile range are preferred over the mean and standard deviation.
- **Linear Transformations of Data:** Review how adding, subtracting, multiplying, or dividing raw scores by a constant predictably alters measures of central tendency (mean) and measures of variability (standard deviation and variance).
- **Mathematical Properties of the Mean:** Understand the primary algebraic properties of the arithmetic mean, including why the sum of raw score deviations around the mean always equals zero: $\Sigma(X - \mu) = 0$.
- **Sample Variance & Degrees of Freedom:** Review the formula for sample variance (s^2) and understand why dividing by degrees of freedom ($n - 1$) provides an unbiased estimate of the population variance.
- **Choosing Appropriate Graphical Displays:** Know when to use bar graphs (for nominal/categorical or discrete data) versus histograms and frequency polygons (for continuous, quantitative distributions).

3. Standardized Scores (z-Scores) & The Normal Curve

- **Calculating and Interpreting z-Scores:** Practice transforming raw scores into standardized z-scores. Understand how z-scores express a score's distance from the mean in standard deviation units and indicate percentile standing.
- **Properties of Standardized Distributions:** Know the mean ($\mu = 0$) and standard deviation ($\sigma = 1$) of any standardized z-score distribution, and understand why transforming raw scores to z-scores preserves original distribution shape.
- **The Empirical Rule (68-95-99.7):** Understand the proportions of a standard normal distribution that fall within 1, 2, and 3 standard deviations of the mean, as well as area calculations above or below specific z-values.
- **Relative Comparisons Across Distributions:** Understand how standardized z-scores enable direct comparisons between performance metrics measured on completely different raw units or scales.

4. Sampling Distributions & The Central Limit Theorem

- **Central Limit Theorem (CLT) Principles:** Understand the conditions under which the sampling distribution of the mean approaches a normal distribution as sample size (n) increases, regardless of the population distribution shape.
- **Standard Error and Sample Size Dynamics:** Understand the mathematical relationship between the Standard Error ($SE = \sigma / \sqrt{n}$) and sample size (n), focusing on how increasing sample size influences the precision of sample estimates.
- **Concept of a Sampling Distribution:** Be able to define a sampling distribution of the mean, understanding how its central tendency relates to the population mean and how its dispersion compares to individual population scores.

5. Hypothesis Testing Logic, Decision Errors & Statistical Power

- **Logic of Significance Testing (NHST):** Understand the step-by-step logic of setting null (H_o) and alternative (H_1) hypotheses, establishing alpha levels (α), defining critical regions, and evaluating p-values.
- **Type I vs. Type II Errors:** Distinguish between rejecting a true null hypothesis (Type I error / false positive, controlled by α) and failing to reject a false null hypothesis (Type II error / false negative, denoted by β).
- **Statistical Power and Determinants:** Understand statistical power ($1 - \beta$) as the probability of correctly rejecting a false null hypothesis. Review how power is affected by sample size, alpha level, effect size, and directional testing.

6. Inferential Tests (t-Tests, Pearson Correlation & One-Way ANOVA)

- **One-Sample t-Test vs. z-Test:** Know when to use a one-sample t-test instead of a z-test when the population standard deviation is unknown, and understand how degrees of freedom ($df = n - 1$) alter t-distribution tail density.
- **Independent-Samples t-Test:** Review the design assumptions, pooled variance calculation logic, and degrees of freedom ($df = n_1 + n_2 - 2$) for evaluating differences between two independent treatment groups.
- **Paired-Samples (Repeated-Measures) t-Test:** Understand the benefits of within-subjects or matched-pairs designs in reducing individual differences and decreasing error variance.

- **Pearson Correlation (r) & Variance Accounted For:** Understand how to interpret correlation strength and direction, calculate degrees of freedom (df = n - 2), and compute the coefficient of determination (r^2) to quantify shared variance.
- **One-Way Between-Subjects ANOVA Logic:** Understand the partitioning of total variance into between-groups and within-groups components, the logic of the F-ratio, and degrees of freedom calculations (df_between = k - 1, df_within = N - k).

Sample / Practice Question Set (5 Questions)

The following 5 questions are extracted sample questions designed for practice, study guides, or classroom discussions. They represent fundamental conceptual domains across research design, descriptive statistics, standardized distributions, sampling distributions, and inferential testing.

Sample Q1. An unmeasured third variable that varies systematically alongside the independent variable and provides an alternative explanation for the observed results is known as a(n):

A) Dependent variable.
B) Confounding variable.
C) Discrete variable.
D) Interaction statistic.

Sample Q2. Which of the following is a fundamental mathematical property of the arithmetic mean?

A) The sum of absolute deviations around the mean is less than around any other point.
B) The mean is unaffected by extreme scores or outliers in a skewed distribution.
C) The mean can be calculated for qualitative variables measured on a nominal scale.
D) The sum of raw algebraic deviations from the mean always equals zero: sum(X - mu) = 0.

Sample Q3. In a standard normal distribution, what percentage of scores falls within one standard deviation on either side of the mean (between z = -1.00 and z = +1.00)?

A) Approximately 50%.
B) Approximately 68%.
C) Approximately 95%.
D) Approximately 99.7%.

Sample Q4. If a researcher increases the sample size n from 25 to 100, what effect does this quadrupling of sample size have on the standard error of the mean? [Hint: Standard Error formula: SE = sigma / sqrt(n)]

A) The standard error is reduced by half (1/2 of its original value).
B) The standard error is reduced to one-fourth (1/4 of its original value).
C) The standard error doubles.
D) The standard error remains unchanged.

Sample Q5. A researcher conducts a one-sample t-test with a sample of n = 25 participants. How many degrees of freedom apply, and how does the t-distribution compare to the standard normal z-distribution?

A) df = 24; the t-distribution has fatter tails and larger critical values than the z-distribution.

B) df = 25; the t-distribution is narrower with smaller critical values than the z-distribution.

C) df = 24; the t-distribution is identical to the standard normal z-distribution.

D) df = 23; the t-distribution has higher central density than the z-distribution.

Part IV: Answer Key & Detailed Explanations (Sample Set)

Sample Q#	Correct Key	Explanation & Statistical Rationale
Sample Q1	**B**	A confounding variable is an extraneous variable that correlates with both the IV and DV, obscuring causal interpretation.
Sample Q2	**D**	The algebraic sum of raw score deviations around the mean always equals zero: sum(X - mu) = 0.
Sample Q3	**B**	Under the empirical rule for normal distributions, approximately 68.26% of observations lie within 1 standard deviation of the mean (z = -1.00 to z = +1.00).
Sample Q4	**A**	Quadrupling n multiplies sqrt(n) by 2, which cuts the standard error in half (SE_new = sigma / sqrt(100) = sigma/10 vs sigma/5).
Sample Q5	**A**	df = n - 1 = 25 - 1 = 24. Because sample standard deviation s estimates sigma, the t-distribution has heavier tails and larger critical values than the z-distribution.

Statistics 2 (PSYC 004) Study Guide

Core Conceptual Directives & Learning Objectives for Exam Preparation

1. One-Way Analysis of Variance (ANOVA) & Post-Hoc Analysis

- **Variance Partitioning in One-Way ANOVA:** Understand how total variation (SS_total) is split into between-groups variance (SS_between) and within-groups variance (SS_within). Know how Mean Squares (MS = SS / df) are computed to reflect systematic treatment effects versus random error.
- **Conceptual Rationale of the F-Ratio:** Focus on why the F-ratio evaluates the ratio of MS_between to MS_within. Understand that under the null hypothesis (H0), both terms estimate individual differences and random measurement error, resulting in an expected F-value near 1.0.
- **Degrees of Freedom in Unbiased Variance Estimation:** Study the fundamental conceptual role of degrees of freedom (df) in ANOVA. Recognize that dividing sums of squares by their respective degrees of freedom provides mathematically unbiased estimates of population variance components.
- **Interpretation of the Omnibus F-Test:** Know that a statistically significant omnibus F-test indicates only that at least two group means differ significantly in the population. Recognize why the omnibus test cannot pinpoint which specific pairs of group means differ without further testing.
- **Familywise Error Rate (alpha_FW) Inflation:** Understand why conducting multiple unadjusted independent-samples t-tests on the same dataset inflates the overall probability of committing at least one Type I error. Study how post-hoc tests control this cumulative risk.
- **Post-Hoc Pairwise Comparison Procedures:** Compare standard post-hoc methods (such as Tukey's HSD and Scheffé's test). Understand how these procedures maintain strict control over the familywise Type I error rate while making all possible pairwise mean comparisons.
- **Effect Size Measures in One-Way ANOVA:** Study the metric of Eta-squared (eta^2 = SS_between / SS_total) as a measure of practical significance. Focus on interpreting eta^2 as the proportion of total outcome variance uniquely explained by group membership.

2. Two-Way Factorial ANOVA & Interaction Dynamics

- **Factorial Design Matrix & Cell Structure:** Understand how multi-factor designs are structured by crossing independent variables (e.g., a 3 x 2 factorial matrix). Know how to determine the total number of factors, levels per factor, and unique treatment combination cells.
- **Conceptual Rationale of Main Effects:** Learn to define a main effect as the isolated overall effect of one independent variable on the dependent variable when collapsing (averaging) across all levels of the other factor(s).
- **Defining and Interpreting Interaction Effects:** Focus on the core concept of an interaction effect, occurring when the effect of one independent variable changes depending on the specific level of a second independent variable. Practice identifying when simple effects differ from overall main effects.
- **Additive Variance Partitioning in Two-Way ANOVA:** Study how total variation (SS_total) partitions additively into Main Effect A (SS_A), Main Effect B (SS_B), Interaction (SS_AxB), and Within-Cells Error (SS_within).
- **Role of MS_within as the Common Error Baseline:** Understand why pooled within-cells error variance (MS_within) serves as the common denominator for testing all main effects and interaction terms under the null hypothesis in factorial ANOVA.
- **Graphical Identification of Interaction Effects:** Practice interpreting line graphs of cell means. Recognize that non-parallel, converging, or intersecting lines visually signify the presence of an interaction effect.

- **Analytical Follow-Up of Significant Interactions:** Know that when a Two-Way ANOVA yields a statistically significant interaction, main effects must be interpreted with caution. Study why analyzing simple main effects is necessary to isolate specific treatment patterns.
- **Independence of Hypothesis Tests in Factorial Designs:** Understand that in balanced factorial ANOVA designs, hypothesis tests for Main Effect A, Main Effect B, and Interaction AxB are orthogonal and tested independently of one another.

3. Repeated-Measures ANOVA & Within-Subjects Control

- **Error Variance Reduction in Repeated-Measures ANOVA:** Understand how repeated-measures designs achieve greater statistical power than between-subjects designs by isolating and removing individual participant differences (SS_between_subjects) from the error term.
- **The Sphericity Assumption & Violation Consequences:** Review the assumption of sphericity, which requires that the variances of difference scores between all possible pairs of repeated treatment conditions are equal. Understand how Mauchly's test evaluates this assumption and why uncorrected violations inflate Type I error rates.
- **Epsilon Adjustments for Sphericity Violations:** Study how degrees of freedom epsilon adjustments (such as Greenhouse-Geisser or Huynh-Feldt) reduce degrees of freedom to make F-tests appropriately conservative when sphericity is violated.

4. Simple & Multiple Linear Regression Modeling

- **Interpretation of Regression Parameters:** Study the simple linear regression model (Y_hat = b0 + b1*X). Focus on interpreting the unstandardized slope (b1) as the expected change in outcome Y per one-unit increase in predictor X, and b0 as the Y-intercept.
- **Ordinary Least Squares (OLS) Criterion:** Understand the mathematical foundation of OLS estimation, which selects regression parameters that minimize the sum of squared vertical residual errors (min sum(Y - Y_hat)^2).
- **Assumption of Homoscedasticity:** Review the classical assumption of homoscedasticity, requiring constant variance of residual errors across all levels of the predicted outcome variable. Recognize how heteroscedasticity threatens inference.
- **Adjusted R-Squared (Adjusted R^2) in Multiple Regression:** Understand why unadjusted R^2 automatically increases whenever any new predictor is added. Study how Adjusted R^2 penalizes for non-informative predictors to prevent model overfitting.
- **Overall Model Significance F-Test:** Know that the overall multiple regression F-test evaluates the null hypothesis that all population regression slopes simultaneously equal zero (H0: beta_1 = beta_2 = ... = beta_k = 0), testing whether population R^2 > 0.
- **Diagnosing and Resolving Multicollinearity:** Study multicollinearity as high intercorrelations among predictor variables. Understand how extreme multicollinearity inflates standard errors, making individual regression slope estimates unstable and difficult to isolate.

5. Partialing Principles & Predictor Importance

- **The Unifying Partialing Principle:** Understand the fundamental core concept uniting partial correlation, semipartial (part) correlation, and multiple regression slopes (beta_k): all isolate the unique linear relationship of a predictor to the outcome after holding constant (partialing out) shared variance from other predictors.

- **Standardized Regression Coefficients (Beta Weights):** Learn how standardized beta coefficients (beta) convert unstandardized regression slopes into z-score units. Focus on how beta weights allow researchers to compare the relative predictive strength of variables measured on different scales.

6. Binary Logistic Regression & Nonparametric Methods

- **Application of Binary Logistic Regression:** Understand when binary logistic regression must be used instead of linear regression—specifically when the dependent outcome is dichotomous (e.g., Success/Failure), violating linear regression assumptions.
- **Interpretation of Odds Ratios (OR):** Focus on interpreting Odds Ratios in logistic regression. Understand that an OR > 1.0 represents a multiplicative increase in the odds of the outcome per one-unit increase in the predictor variable.
- **Expected Frequencies in Chi-Square Tests:** Understand the conceptual logic and computation of expected cell frequencies under the null hypothesis of independence, where E = (Row Total * Column Total) / N.
- **Chi-Square Goodness-of-Fit vs. Test of Independence:** Distinguish between Goodness-of-Fit (evaluating whether a single categorical variable matches a theoretical distribution) and Test of Independence (evaluating the association between two categorical variables).
- **Rationale and Assumptions of Nonparametric Tests:** Understand when rank-based nonparametric procedures are preferred over parametric inferential tests, such as when data violate normality, exhibit severe skewness, or are measured on ordinal scales.
- **Parametric vs. Nonparametric Test Correspondences:** Study the direct correspondence between classical parametric tests and their rank-based nonparametric counterparts (e.g., Independent-Samples t-test vs. Mann-Whitney U / Wilcoxon Rank-Sum test; Paired-Samples t-test vs. Wilcoxon Signed-Ranks test; One-Way ANOVA vs. Kruskal-Wallis test; Repeated-Measures ANOVA vs. Friedman test).

Practice Question Set (5 Questions)

Sample Q1. In a One-Way Between-Subjects ANOVA, what does the numerator (Mean Square Between, MS_between) of the F-ratio measure relative to the denominator (Mean Square Within, MS_within)?

A) Individual differences/random error variance alone relative to systematic treatment effects combined with residual error variance.

B) Total population variance across all sample observations relative to the standard error of the sample grand mean.

C) Systematic treatment variance combined with individual differences/error variance relative to individual differences/error variance alone.

D) The difference between treatment group variance and error variance divided by total sample size across all conditions.

Sample Q2. In a One-Way ANOVA, what does the eta-squared (eta^2 = SS_between / SS_total) effect size metric represent?

A) The proportion of total variance in the dependent variable that is uniquely accounted for by the independent variable.

B) The overall probability of committing a Type II error when failing to reject a false null hypothesis.

C) The mathematical ratio of sample error variance to population standard deviation across all conditions.

D) The exact level of statistical significance achieved across all possible post-hoc pairwise group comparisons.

Sample Q3. What core statistical principle unites partial correlations, semipartial (part) correlations, and multiple regression slopes (beta_k)?

A) They all convert non-linear curvilinear relationships into standardized bivariate Pearson r correlations.

B) They all assume that predictor variables are measured on nominal qualitative scales of measurement.

C) They all require that the dependent outcome variable has a standard deviation equal to exactly 1.0.

D) They all isolate the unique contribution of a predictor to the outcome after controlling for other predictors.

Sample Q4. In a binary logistic regression predicting graduate school admission (1 = Admitted, 0 = Denied), a predictor has an Odds Ratio of OR = 2.50. How is this interpreted?

A) For every 1-unit increase in the predictor, the probability of admission increases by exactly 250 percent.

B) For every 1-unit increase in the predictor, the odds of being admitted are multiplied by 2.50.

C) The predictor variable uniquely accounts for 25 percent of the total variance in admission status.

D) The predictor variable reduces the odds of graduate school admission by a multiplicative factor of 2.50.

Sample Q5. What is the fundamental conceptual difference between a Chi-Square Goodness-of-Fit Test and a Chi-Square Test of Independence?

A) Goodness-of-Fit tests continuous ratio variables; Independence tests nominal qualitative variables.

B) Goodness-of-Fit requires sample sizes over 500; Independence requires sample sizes under 30.

C) Goodness-of-Fit evaluates 1 categorical variable against a theoretical distribution; Independence evaluates relationship between 2 categorical variables.

D) Goodness-of-Fit evaluates main effects; Independence evaluates linear regression residual slopes.

Part IV: Sample Question Set Master Answer Key

Question	Key	Explanation & Core Statistical Concept
Sample Q1	**C**	MS_between captures both treatment effects and individual differences error variance, whereas MS_within reflects only random error variance.
Sample Q2	**A**	Eta-squared measures the strength of association by indicating the proportion of total outcome variance explained by group membership.
Sample Q3	**D**	Partial correlation, semipartial correlation, and regression coefficients all share the core logic of partialing out shared variance to assess unique predictor contributions.
Sample Q4	**B**	An Odds Ratio of 2.50 indicates that a 1-unit change in predictor X multiplies the odds of success (Y=1) by 2.50.
Sample Q5	**C**	Goodness-of-Fit tests whether sample proportions for 1 variable match a hypothesized distribution; Independence tests association between 2 variables.

Personality Psychology: Study Outline and Example Questions

The Personality Psychology portion of the exam is designed to provide students with the opportunity to demonstrate a small range of foundational knowledge about personality. The key personality learning outcomes offer students the opportunity to get a sense of the scope of the range of critical thinking from recall to application which may require some higher order thinking. Both the practice questions and subsequent key with answers plus more details are designed to offer a stronger sense of what to expect from the personality questions of the exam.

Key Personality Student Learning Outcomes

1. **Foundations.** Define personality psychology, distinguish it from related fields (developmental, social, cognitive, clinical, health), and name McAdams's three layers of personality: dispositional traits, characteristic adaptations, and narrative identity.
2. **Traits:** Identify the five traits of the Big Five Factor Model, describe Allport's trait approach and temperament as an early foundation of traits, and recognize that traits are fairly stable yet still change across the life course.
3. **Motives and goals:** Explain how motives and goals shape personality as characteristic adaptations, using Maslow's hierarchy of needs and Bandura's self-efficacy and observational learning.
4. **Identity and life story (the author).** Describe identity development through Erikson's psychosocial theory (identity vs. role confusion), McAdams's narrative identity, and Cross's theory of Nigrescence (Black racial identity development).
5. **Culture and personality.** Explain how culture relates differently to each layer: trait structure is broadly similar across cultures, goals and values are more shaped by culture, and life stories draw most directly on the stories and meanings a culture provides.

Personality Practice Sample Question Types

P1. Which question would a personality psychologist be most likely to study?

A. How do children's memory abilities develop with age?

B. Why do some people seek excitement across many situations while others avoid it?

C. How does being in a crowd affect whether people help a stranger?

D. Which treatment works best for depression?

sP2. Kevin is talkative, energetic, and seeks out parties and group activities. Which Five Factor trait does this describe?

A. Openness

B. Agreeableness

C. Extraversion

D. Conscientiousness

P3. A child watches her older sister get praised for sharing and later starts sharing with her friends. Bandura would call this:

A. Observational learning

B. Classical conditioning

C. Self-actualization

D. Temperament

P4. In the theory of Nigrescence, a person who has a secure Black identity, keeps Black culture central, and is open to relationships with people of other groups is in which stage?

A. Pre-encounter

B. Encounter

C. Immersion-emersion

D. Internalization

P5. Which layer of personality is most directly shaped by culture?

A. Dispositional traits

B. Narrative identity

C. Temperament

D. All layers are shaped equally

Answer Key

P1 B (personality studies individual differences across situations; A is developmental, C social, D clinical). P2 C (extraversion). P3 A (learning by watching a model). P4 D (internalization: secure, open, Black identity remains central). P5 B (culture supplies the stories people use to build their life stories).