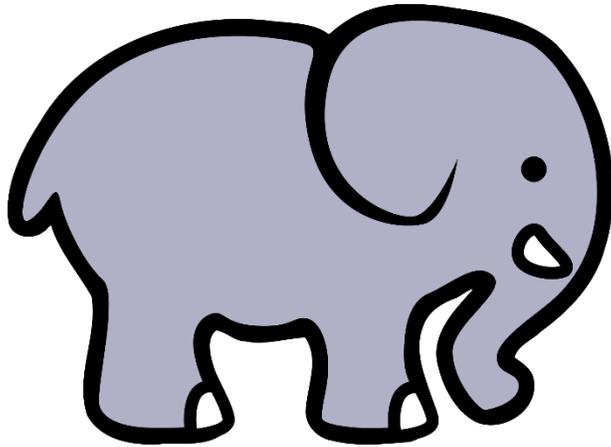
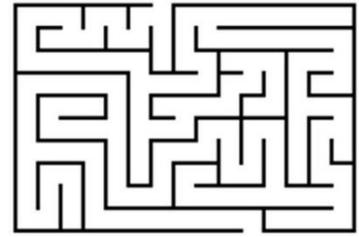


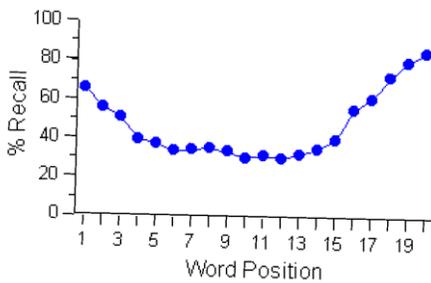
Unit 5

Memory and Cognition



ZITS

BY JERRY SCOTT AND JIM BORGMA



Memory & Cognition Unit Guide

Essential Questions

- How do psychologists describe the human memory system?
- How do sensory memory, short-term memory, and long-term memory work, and what are their capacities and durations?
- What is the difference between implicit and explicit memories, and how does this relate to processing?
- What are some effortful processing strategies that can help us remember new information?
- How do brain structures play a role in memory processing?
- How do emotions affect our memory processing?
- How do external cues, internal emotions, and order of appearance influence memory retrieval?
- Why do we forget?
- How does misinformation, imagination, and source amnesia influence our memory construction?
- How reliable are eyewitness descriptions, and why are reports of repressed and recovered memories so hotly debated?
- How can you use memory research findings to do better in this and other courses?
- What is cognition, and what are the functions of concepts?
- What cognitive strategies assist our problem solving, and what obstacles hinder it?
- How can representativeness and availability heuristics, overconfidence, belief perseverance, and framing influence our decisions and judgments?
- What are the structural components of language?
- What are the milestones in language development?
- How do we acquire language?

Key Terms, Concepts and Contributors

<p>MODULE 31: Memory Encoding Storage Retrieval Parallel processing Sensory memory Short-term memory Long-term memory Working memory Explicit memory Effortful processing Implicit memory Automatic processing Iconic memory Echoic memory Chunking Mnemonic devices Spacing effect Testing effect Shallow processing Deep processing</p>	<p>MODULE 32: Hippocampus Cerebellum Flashbulb memory Long-term potentiation Recall Recognition Relearning Priming Context-dependent memory State-dependent memory Mood-congruent memory Serial position effect Primacy effect Recency effect</p> <p>MODULE 33: Anterograde amnesia Retrograde amnesia Encoding failure Decay theory Proactive interference Retroactive interference Motivated forgetting Repression Misinformation effect Source amnesia Déjà vu Memory reconstruction</p>	<p>MODULE 34: Cognition Concept Prototype</p> <p>MODULE 35: Algorithm Heuristic Insight Confirmation bias Mental set Intuition Representativeness heuristic Availability heuristic Overconfidence Belief perseverance Framing</p>	<p>MODULE 36: Language Phonemes Morphemes Grammar Receptive language Babbling stage One-word stage Two-word stage Telegraphic speech Language acquisition device Critical periods Aphasia Wernicke's area Broca's area Linguistic determinism</p> <p>KEY CONTRIBUTORS: Hermann Ebbinghaus Elizabeth Loftus Noam Chomsky Benjamin Whorf</p>
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Name: _____

MEMORY: A PREVIEW

Directions: You need to visit all 10 stations during the class period. Record your responses on this sheet.

STATION #1: Which states were you able to identify by their shapes?

STATION #2: What's wrong with Matt Damon's character?

STATION #3: Which did you choose to construct? How easily was it for you to remember how to do this?

STATION #4: Your answer? Why do you know this?

STATION #5: Which logos do you recognize?

STATION #6: Description of 1st day of freshman year.

STATION #7: What is exceptional about Stephen Wiltshire?

STATION #8: How many of those people can you name?

STATION #9: Your memory drawing:

STATION #10: What are the names of the 7 Dwarves?

REFLECTION QUESTIONS:

1. How easy were today's memory tasks for you? Were some easier than others? Why?
2. Based on today's activity, what predictions can you make about our next unit - Memory & Cognition?



Remember This Video Guide

Game 1:

What part of brain receives information from the senses to possibly place into storage?

How many items can short-term memory retain?

Game 2:

How many numbers/letters did you remember from the \$1 bill?

How does Ron White memorize the serial numbers?

Game 3:

How many of the items did you remember?

Why does your short term memory have a limited capacity?

What is the purpose of your short term memory?

Game 4:

What was the technique explained to help remember more of the items?

Using the above method makes it easier to move information from _____ to

_____.

Game 5:

What part of brain seems to be especially good at noticing and remembering faces?

Game 6:

Why did the inverted picture of the celebrity appear to be normal?

Game 7:

How many of the faces did you correctly match up with their name?

How does Ron White remember faces to names?

Game 8:

Which suspect in the line-up do you think is the robber (1-5)?

What is unconscious transference?

What part of the brain is involved with strong emotional experiences?

Game 9:

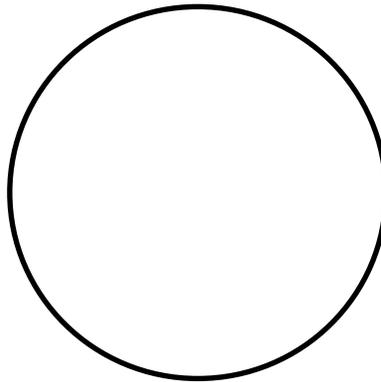
How did the extra witnesses affect the memories of the other witnesses?

RECOGNITION IS EASY, RECALL IS HARD

Can you tell which of the following is the real penny?



Now, draw a picture of the US quarter in the circle below. Try to get as many details as you can.



Whose face did you draw on the quarter?

Which of the two activities was easier, picking out the correct penny or drawing the details of a quarter from scratch? Why?

RECOGNITION IS EASY

The human brain was “designed,” through millions of years of natural selection and evolution, to recognize things quickly. By contrast, recalling memories, i.e., retrieving them without perceptual support, must not have been as crucial for survival, because our brains are much worse at that. Remember how our long-term memory works: perceptions enter through our sensory systems, and their signals reach the brain, and cause complex patterns of neural activity. ...Over time, connections between neural patterns develop in such a way that activating one pattern activates the other. Roughly speaking, each pattern of neural activity constitutes a different memory. If a perception comes in that is similar to an earlier one and the context is close enough, it easily stimulates a similar pattern of neural activity, resulting in a sense of recognition. Recognition is essentially perception and long-term memory working together. As a result, we assess situations very quickly. Our distant ancestors on the East African savannah had only a second or two to decide whether an animal emerging from the tall grasses was something they would regard as food or something that would regard them as food (see Fig. 9.1). Their survival depended on it. Similarly, people recognize human faces very quickly—usually in a fraction a second (see Fig. 9.2).



FIGURE 9.1 Early hominids had to recognize quickly whether animals they spotted were prey or predators.



FIGURE 9.2 How long did it take you to recognize these faces?

That explains why, when presented with faces we have not seen before and asked if they are familiar, we don't spend a long time searching through our memories to try to see if that face is stored in there somewhere. There is no search. A new face stimulates a pattern of neural activity that has not been activated before, so no sense of recognition results. Of course, a new face may be so similar to a face we have seen that it triggers a misrecognition, or it may be just similar enough that the neural pattern it activates triggers a familiar pattern, causing a feeling that the new face reminds us of someone we know.

RECALL IS HARD

In contrast, recall is long-term memory reactivating old neural patterns without immediate similar perceptual input. That is much harder than reactivating a neural pattern with the same or similar perceptions. People *can* recall memories, so it obviously is possible for other neural patterns to reactivate a pattern of neural activity corresponding to a memory. However, the coordination and timing required to recall a memory increase the likelihood that the wrong pattern or only part of the right pattern will be activated, resulting in a failure to recall. Whatever the evolutionary reasons, our brain did not evolve to recall facts. Many schoolchildren dislike history class because it demands that they remember facts, such as the year the English Magna Carta was signed, the capital city of Argentina, and the names of all 50 U.S. states. Their dislike is not surprising; the human brain is not well suited for that sort of task.

Give me one example of where you have had to use each type of retrieval in your day-to-day life:

Recognition:

Recall:

Name: _____

MEMORY: Forgetting

Which of the following (questions 1-4) is retroactive and which is proactive interference?

1. After studying for your sociology test, you study for your psychology test. You then go take the psychology test and keep remembering the terms from sociology instead of psychology.

2. A Professor currently has a T.A. named Brian after having worked with another T.A. named Chris for several years. She keeps calling Brian by the name Chris.

3. You used to use a PC with Windows. Now you've switched to using a Mac. When you go back to using the PC, you keep depressing the "command" or "apple" key to get the PC to do what you want.

4. Big Ed knows how to play field hockey and now wants to learn to play ice hockey. If his prior knowledge of field hockey interferes with his learning to play ice hockey, this is an example of

5. Eddy experienced a horrible snowboarding accident. He hit a tree. Now he can't recall anything that happened the morning prior to the accident. What type of amnesia does Eddy have?

6. In the movie *Memento*, the main character cannot make new memories. He wakes up everyday, re-meeting the same people. (that is, he has met these people before, but can't remember meeting them, and so, re-introduces himself to them every day) What type of amnesia is this called? _____

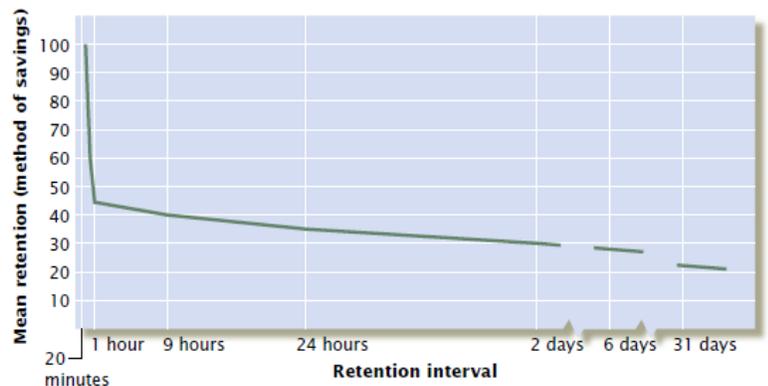
7. Burt fell off a ladder and sustained brain injuries. When asked about the events leading up to the accident, he said he could not remember. Burt is most likely experiencing

8. According to Ebbinghaus's forgetting curve, you should review your lecture notes within the first

after class.

9. You are driving down the street when you see a billboard showing a phone number for a service you want. You keep repeating the number over and over so you won't forget it until you get home, where you can write it down. You do this to prevent the process of _____ from causing you to forget the number.

10 Jorge was in an auto accident and now has difficulty remembering anything new. He can remember everything prior to his accident, but nothing since it. His doctors suspect that his _____ has been damaged.



MEMORY LOSS CASE STUDIES

Case 1

Patient H.M. had brain surgery when he was 27 yrs. old. The surgery involved removal of part of the brain known as the hippocampus to alleviate the severe symptoms of epilepsy. Although the surgery controlled the epileptic seizures H.M. suffered serious and debilitating memory impairment as a side effect.

His short-term memory was normal but he was completely unable to transfer any new information into his long-term memory. He showed almost no knowledge of current affairs because he forgot any news item as soon as he had read about it; he knew nothing of recent family events including moving house and the death of his father.

Despite being able to remember people he had known long ago he was never able to store information about new people he encountered and they remained forever complete strangers to him.

What type of memory loss is H.M. suffering from? _____

How do you know? _____

Case 2

Patient K.C. has normal intelligence and relatively well-preserved perceptual, linguistic, short-term memory, and reasoning abilities. He possesses some incomplete general knowledge about his autobiographical past. He does not remember a single personal event or happening from any time of his life. He has some preserved expert knowledge related to the work he did for 3 years before the onset of amnesia, although he has no personal recollections from that period.

What type of memory loss is K.C. suffering from? _____

How do you know? _____

Case 3

Patient C.W. was a 58-year-old man presenting to the emergency department after an unwitnessed fall from a second-story balcony. On admission, the patient had a blood alcohol level of 0.2 percent and a Glasgow coma scale score of 9 (range: 3-15) and he required intubation to protect his airway. After stabilization, a computed tomography (CT) of the head was ordered, which showed brain deterioration; no neurosurgical intervention was needed.

A psychiatry consult was called due to the patient's "confusion and agitation." During our initial evaluation, the patient denied mood disturbance, auditory/visual hallucinations, delusions, or lethality; however, he did make up many stories including the death of President Obama and his recent arrival from California that morning.

What type of memory loss is C.W. suffering from? _____

How do you know? _____

**Case
4**

Patient L. R. was brought to neurological evaluation by her brother because of a 3 year history of memory impairment. She had lived alone and maintained her own home and financial affairs since the death of her husband a few years ago. The brother had begun to notice gradually worsening memory impairment and difficulty finding words, but the patient became angry at the suggestion that she may have a progressive impairment. Others had noted decline in housekeeping and financial affairs, but she had no complaints.

What type of memory loss is L.R. suffering from? _____

How do you know? _____

**Case
5**

Patient K.W. has been having getting into frequent conflicts with his childhood friend, Bob, because lately he has begun telling other mutual friends detailed stories of trips he took as a child. His friend Bob is very upset because K.W. did not actually take these trips, but rather heard the detailed stories from his friend Bob years ago and now K.W. is not sure if those are his own personal memories or if they were Bob's.

What type of memory loss is K.W. suffering from? _____

How do you know? _____

Memory Loss Terms:

Retrograde Amnesia

Source Amnesia

Anterograde Amnesia

Alzheimer's disease

Korsakoff's syndrome

THE WAYS WE THINK...



Watch the following video and use your textbook to complete the chart on this side of the page...

<http://tinyurl.com/m8d2zfm>

<http://tinyurl.com/ldqzex8> or go to class website to access these videos

Cognition Term	Definition
1. Algorithm	
2. Availability Heuristic	
3. Belief Perseverance	
4. Cognition	
5. Concepts	
6. Confirmation Bias	
7. Fixation	
8. Framing	
9. Functional Fixedness	
10. Heuristics	
11. Insight	
12. Mental Set	
13. Overconfidence	
14. Prototypes	
15. Representative Heuristics	

1. In groups, discuss your definitions and amend yours if necessary.
2. Come up with examples for each of the 15 terms.
3. Next, your group will be given a piece of butcher paper and assigned ONE term.
 - On the butcher paper provided:
 1. DRAW something to represent your term WITHOUT naming the term on the top half of the paper.
 2. On the bottom half of the paper, WRITE out a different example of your assigned term from the one you drew WITHOUT naming the term.

Cognition Term	Example	Station # (to be used tomorrow)
1. Algorithm		
2. Availability Heuristic		
3. Belief Perseverance		
4. Cognition		
5. Concepts		
6. Confirmation Bias		
7. Fixation		
8. Framing		
9. Functional Fixedness		
10. Heuristics		
11. Insight		
12. Mental Set		
13. Overconfidence		
14. Prototypes		
15. Representative Heuristics		

Name: _____

COGNITION APPLICATIONS

BUILDING BLOCKS OF COGNITION

Come up with your own example of a **concept** (for example – chairs). What characteristics do you look for in order to categorize something into this concept?

What would your **prototype** be for this concept?

What would NOT be a good prototype? Why?

PROBLEM-SOLVING

At the end of class, Mrs. Matus asks you to get her cell phone charger out of her car. She hands you her car keys and begins getting ready for her next class. You get out to the parking lot and realize that her keys are old-school: no remote locks or starter, no panic button, no make or model that you can identify.

How could you use an **algorithm** to solve this problem?

Why is this an example of an algorithm?

How could you use a **heuristic** to solve this problem?

Why is this an example of a heuristic?

When was the last time you personally had a moment of **insight**? Describe your experience.

PROBLEMS WITH USING HEURISTICS



What assumptions would you make about this woman based on her appearance?

What would her opposite be? Draw in the box.

How does this exemplify the **representative heuristic**?

In the chart below, circle your answer to the question and explain why you chose that.

QUESTIONS & ANSWERS	EXPLANATION
Which scares you most? Flying in a plane OR Driving in a car	
Which should the government spend more money on? Homeland Security OR Traffic Safety	
Which is more dangerous? Sharks OR Toasters	

How might these be examples of the **availability heuristic**?

How can using heuristics lead to **overconfidence**?

Name: _____

ISSUES WITH PROBLEM SOLVING & MAKING JUDGMENTS

In the space below, create a cartoon illustrating **fixation**.

In the space below, create a cartoon illustrating **functional fixedness**.

In the space below, create a cartoon illustrating a **mental set**.

What do these three terms have in common?

What subtle differences exist between them?

Fixation

Functional Fixedness

Mental Set

Memory Cognition Video Project

Objective: To create a short video to help your peers remember the vocabulary words.

We often remember things better when we have a personal connection or our friends are part of the situation. So let's remember some of our vocabulary terms by creating short videos for our peers.

In groups of three, you will create a short video on one of the vocabulary words for this unit. Your video can be anywhere from 6 seconds to 60 seconds (maximum). You can use a fun free app to create your video, like Vine, Stop Motion, Flipgram, Lapse It, etc. OR you may choose an online free website like [Powtoon](#), WeVideo, or [Google Story](#). Your group can also just film an easy video on your phone & then upload it to your Google Drive.

Here are the possible terms: Have one representative see your teacher to pick your term.

automatic processing
elaborative rehearsal
echoic memory
procedural memory
serial position effect
semantic encoding
flashbulb memory
implicit memory
explicit memory

Insight
algorithm
overconfidence
fixation
framing
mental set
prototype
belief perseverance
representative heuristic

Step One: Define your term & write an example...so that you understand it! Check in with your teacher to move on to Step 2!

Step Two: Quickly plan how you will demonstrate your vocabulary word to the class in a video. Film & edit your video.

Step Three: When your video is complete upload it to your Google Drive or YouTube.

Step Four: Follow up with your teacher – you may either link the video to Google Classroom or send it to your teacher via email. Be sure to follow their directions!

Student Examples: from Cary-Grove High School

Automatic Processing: <http://goo.gl/Lgm9ES> (Google Docs Story Builder)

Spacing Effect (AP): <http://goo.gl/ZCQB7v>

Echoic Memory: <http://goo.gl/pSr3Lm> (Stop Motion)

Flashbulb Memory: <http://goo.gl/GblQe3> (Flipagram)

Terms for Extra Credit Flashcards:

Unit 5: Memory & Cognition

Sensory registers	Cocktail party phenomenon	Short term memory
Chunking	Long term memory	Tip-of-the-tongue phenomenon
Decay theory	Proactive interference	Retroactive interference
Rote rehearsal	Elaborative rehearsal	Explicit memory
Implicit memory	Semantic memory	Episodic memory
Eidetic memory	Autobiographical memory	Flashbulb memory
Memory reconstruction	Mnemonic devices	Cognition
Concept	Prototype	Algorithm
Heuristic	Insight	Confirmation bias
Mental set	Functional fixedness	Representativeness heuristic
Availability heuristic	Overconfidence	Framing
Belief bias	Belief perseverance	Serial position effect
Parallel processing	Automatic processing	Shallow processing
Deep processing	Spacing effect	Testing effect
Retrograde amnesia	Anterograde amnesia	Source amnesia
Convergent thinking	Divergent thinking	Phoneme
Morpheme	Babbling stage	One-word stage
Two-word stage	Telegraphic speech	Linguistic determinism

Pick 15 terms from the above list (or from the unit guide on the back of the packet cover) that you are least familiar/comfortable with and construct a flashcard including the following information:

1. On one side, **define** the term IN YOUR OWN WORDS. Try and keep the definition short, meaningful, and something that you can remember.
2. On the other side, **draw** a picture that demonstrates the term OR **describe** a personal example.

You may earn up to 5 points of extra credit for your 15 flashcards!

All flashcards must be turned in by the day of the unit assessment – no late flashcards will be accepted!

