Quiz 3
Name: _____

1. Of the following two excerpts, which corresponds to the opening paragraph of a science news article and which corresponds to the opening paragraph of a scientist summary or perspective article? When identifying the identity of each excerpt, make sure to give at least two concrete examples for *why* you think that is the identity of the piece. [2 pts; Science Communication]

Excerpt 1 (Source 1):
One of the most deep-seated misconceptions about the human psyche is that men are simple and women are complicated (***1***). Gender psychology scholars trace this belief back to at least the 19th century, when the long-standing view that women were inferior versions of men started to fall out of favor (***2***). In response, biological theories on the sexes were restructured into a narrative that characterized the emergent psychological properties of the female brain—"sensitivity, perceptual acumen, and emotionality"—as not lesser than, but complementary to, those of men's brains (***1***). This framed women as a disordered, unstable yin to men's rational, orderly yang, thus preserving the patriarchy. So-called scientific explanations of why women's mental proclivities deviated from men's relied heavily on the purported influence of reproductive physiology on the female mind (***3***). More than 100 years later, this idea still shapes not just how society perceives women but also how biomedical scientists approach animal research.

Excerpt 2 (Source 2):
The male mind is rational and orderly while the female one is complicated and hormonal. It is a stereotype that has skewed decades of neuroscience research towards using almost exclusively male mice and other laboratory animals, according to a new study.

Scientists have typically justified excluding female animals from experiments – even when studying conditions that are more likely to affect women – on the basis that fluctuating hormones would render the results uninterpretable. However, according to Rebecca Shansky, a neuroscientist at Northeastern University, in Boston, it is entirely unjustified by scientific evidence, which shows that, if anything, the hormones and behaviour of male rodents are less stable than those of females.

Space to write:

Excerpt 1: scientist summary; Excerpt 2: science communication. 1 point is that most scientist summaries have a lot of in-text citations, where science communication articles do not. There is more jargon in Excerpt 1 than there is in Excerpt 2, suggesting that it's been written for a more scientific than general audience (e.g., 'psychology scholars; emergent psychological properties)—she also seems to be *talking* about the relevance of the work in a way that scientists would care about but maybe not others (how biomedical scientists approach animal research; is that the hook? Or is the sexism the hook?). Finally the SciComm piece also quotes the author of the first Excerpt, which makes it clear that it's covering a piece rather than summarizing literature. The SciComm piece also starts off much shorter, because it knows it has to get to the point ASAP, whereas the scientist summary piece/perspective wants to make the point to be covered.

Any reasonable answer would be accepted with proof.

2. You are a developmental researcher and hypothesize that 1-year olds are capable of detecting semantic violations in spoken language. In your experiment, you are recording EEG from 1-year olds who are seated in front of two speakers (left and right) that alternately play spoken sentences. The left speaker plays regular sentences while the right speaker plays sentences entailing semantic violations. Which of the following findings would support your hypothesis? [1 pt; Language]

A. The infants spend more time orienting toward the left than toward the right speaker, and they display a suppressed N400 ERP to the semantic violations
B. The infants attend equally to both speakers but show a larger N400 ERP to the semantic

violations

C. The infants spend more time orienting toward the right than toward the left speaker, and they display an enhanced N400 ERP to the regular sentences compared to the semantic violations
D. The infants spend more time orienting toward the right than toward the left speaker, and they display an enhanced N400 ERP to the semantic violations

3. During our discussion on language, we went over several examples of how context might affect the processing and perception of language. Describe two behavioral effects and what role context plays [2 pt; Language].

Phonemic restoration effect: even though you hear white noise or a cough in the middle of someone saying a particular phoneme in a word, you can still infer what the word is.

Speech segmentation: we're able to break a stream of sounds into words because we infer based on the context what the speaker meant to say.

Word superiority effect: we can recognize letters more quickly when they're in a word than when they are presented in isolation or in a non-word.

Lexical ambiguity: words can have multiple meanings, but some words are used more frequently than others, so we infer based on the context and frequency of word usage in that context what meaning of the word is appropriate for that context.

4. Based on the findings of Bergelson and Aislin (2017) and Yu et al. (2019) on how 6-month-olds and 9-month-olds understand language, what might you recommend to parents? That is, what can parents do to better help their infants understand what the parents are saying? Point out something directly related to the paper you discuss as evidence for that piece of advice. [1 pt; Language]

Bergelson and Aislin (2017) find that object co-presence is correlated with children's comprehension of language; in other words, children won't understand words unless they've seen the object and possibly had an interaction with the object in their environment. Therefore, parents should make sure that if they want their child to learn a particular word, they should have some physical representation of the word for the child to associate with the word.

Yu et al. (2019) point out how joint attention and sustained attention are both predictive of vocabulary sizes at 12 and 15 months, but that sustained attention is the stronger predictor of later vocabulary size. Parents could disambiguate instances in which they are naming an object. They could make sure that they are looking at the object they name and drawing their child's attention to give a good "learning moment," and when their child has sustained attention to an object, they could name that particular object. This will help the child remember the vocabulary word later on.

5. Compare and contrast Atkinson and Shiffrin's short-term memory model against Baddeley's revised (i.e., later) working memory model. What is different and what is similar? Give at least two concrete examples. [2 pt; Working Memory]

In both models, what is in working memory or short-term memory is encoded into long-term memory, and what is in long-term memory can be instantiated in short-term memory/working memory. Similarly, both models discuss sensory memory – in Atkinson, this is all one type of memory, whereas in Baddeley, there are separate processors (phonological loop, visuospatial sketch pad). In both models, there are ways for "control processes" to affect short-term or working memory; in Atkinson, control processes are how you're rehearsing information to maintain it in STM, while in Baddeley's model, the central executive is managing the information from LTM and phonological loop/visuospatial sketch pad. Many of the differences are thus in the actual execution

of the two models (i.e., having separate processors for different types of sensory memory; focusing on short-term memory vs. working memory).

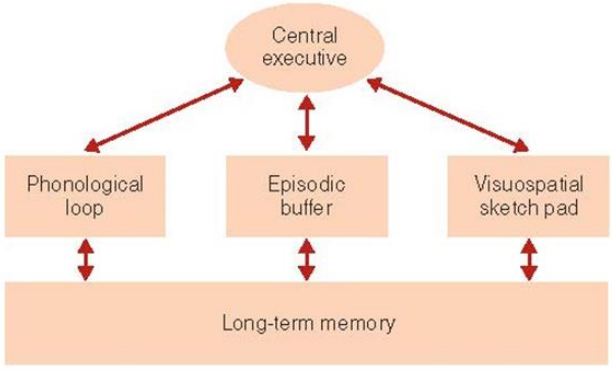
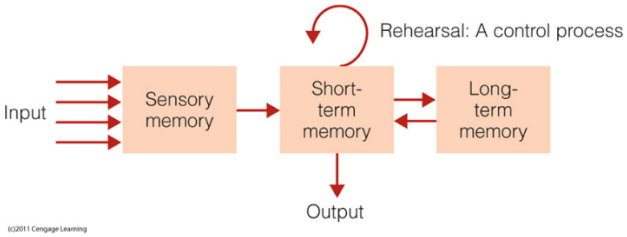


Figure 5.21 Baddeley's revised working memory model, which contains the original three components plus the episodic buffer. © Cengage Learning



6. If Peyton Manning, a professional football player, wanted to remember his 16-digit credit card number, which of the following memory techniques would you recommend? [1 pt; Working memory]

A. He should think of the numbers as a sequence of football statistics.
B. He should picture each of the numbers in his head printed in a bright color.
C. He should first memorize a few other sequences of 16 digits to gain some practice.
D. He should visualize the front of his credit card showing a picture of him dribbling a basketball.

7. You have administered a word-list (e.g., barricade, trout, etc.) free recall task to a group of normal control subjects and a group of amnesiacs with MTL lesions. Which of the following statements is most accurate? [1 pt; Working Memory/LTM]

A. The controls will show the best recall for the most recent items on the list, and the worst recall for the earliest items on the list
B. If the controls are distracted between list-learning and recall, they will not demonstrate a recency effect
C. Because of their MTL lesions, amnesiacs will show no recency effect
D. All of the above

8. You are conducting a memory experiment where you manipulate the *level of encoding* of word stimuli. In the "shallow" encoding condition, subjects have to indicate whether words are printed in lower or upper case letters (a non-semantic task), and in the "deep" encoding condition they have to indicate for each word whether it refers to a living or a non-living thing (a semantic task). After this encoding phase, you perform two memory tests: a standard recognition memory test to probe declarative memory, and a stem-completion test to probe for priming (e.g., _S S _ S S _ _). What is

the most likely result? [1 pt; LTM]

A. The shallow encoding condition would produce greater declarative memory but less priming effects than the deep encoding condition
B. The shallow encoding condition would produce equal declarative memory as the deep encoding condition but greater priming effects
C. The shallow encoding condition would produce worse declarative memory but greater priming effects than the deep encoding condition
D. The shallow encoding condition would produce worse declarative memory than the deep encoding condition, but priming effects would be about the same for the two conditions

9. You are now cognitive psychology scholars, well versed in memory research. What advice would you give to a Duke freshman on how to study most effectively? Provide at least two concrete tips based off behavioral effects that we discussed in class or were mentioned in either your textbook or academic readings [2 pt; LTM processes].

Elaborative Rehearsal, Levels of Processing, Self-reference, Organization, Testing Effect/Retrieval Practice, Encoding Specificity, State-dependent Learning, Transfer-appropriate processing – we went over all of these in class.

Some from the readings that we did not get to by then:
-spaced/distributed practice
-elaboration, generation, relating words to survival value, visual imagery
-sleep
-avoiding the illusion of learning

10. Similarly, now that you know some research on working and long-term memory, how would you apply this research to your Science Communication pieces? Give at least one concrete point based off something different than what you might mention in #9 [1 pt; LTM].

The idea here behind these questions is to ask students to apply the material to what they would do, making it more relevant for them so that they will remember the material better.

For example, students could discuss organization and how having a meaningful framework for the research paper that they will cover will help their readers remember the paper better.

Because short-term memory is only 15-20 seconds, that means that shorter sentences will work in their favor. Specifically, people can only hold a certain amount of information in their mind, so long sentences make people work harder and are harder to remember.

Students could discuss the self-reference effect, making information meaningful to their readers, so that they will remember the information better. This could be an application of the Yin et al. (2019) paper (prioritization in working memory) or just generally as we discussed in LTM.

Visual imagery: students could talk about how they need to reduce jargon down to images or stories that people can picture in their mind, as these kinds of stories are better remembered.

11. We talked on our first day of class about how all models are wrong, but some are useful. Describe two sources of evidence for two different branches in our current model of long-term memory structure, which make this model a useful model of LTM [2 pt; LTM].

Students can talk about any of the following:

Episodic vs. Semantic: K.C. vs. Italian Woman

Episodic vs. Procedural: H.M./Clive vs. Parkinson's
Episodic vs. Priming: Developmental & MS
STM vs. LTM: HM/Clive vs. K.F.; recency vs. primacy

Bonus Point—

12. In Bergelson and Aslin (2017), the authors discuss performance differences for 6-month-olds who are asked to identify semantically related and unrelated words. One of the limitations the authors identify is that the performance difference they observe could be the result of two factors: competition or underspecification. The infants could know something about tested words, but couldn't overcome competition between activation of related concepts ("car" leads to looking a car, but also activating 'stroller' to a similar degree, so that means poorer performance), OR the infants could tell apart unrelated vs. related items, but not really know what belongs in particular categories ("car" isn't referring to juice, but is stroller in the "car" category?). How might you tell the difference between the 2 possible explanations in a follow-up experiment? [bonus point; Language]

The authors mention how in older participants, they use "pointing", overt (touch or click) target selection, or cleaner eye movements, but how this is not possible in 6-month-olds. They suggest that neural recordings or reaching tasks could be useful. One has to consider the constraints of infants and how much they can actually move.

So, one could imagine that if you're trying to see if there's greater competition between related concepts or if there's a lack of concept differentiation, you could look at neural activation in EEG or fMRI. You could see if responses are more similar in baby brains for these semantically related objects; can you actually "classify" based on activation patterns whether the baby sees the stroller in the "car" category? Does the baby's brain activate for semantic violations for the words that are related but don't fit the context (e.g., N400)?

Generally, I gave credit to anyone trying to come up with an idea so long as it was reasonable and based in something we had discussed.