

University of California, Berkeley  
Department of Psychology

Psychology W1

Summer 2016

Midterm Examination 1

**KEY**

Correct answers marked  
with a double asterisk  
(\*\*)

**Preliminary Feedback**

What follows is preliminary feedback on Midterm Examination 1 – the correct answers and brief explanations of them.

Later today I will review the item analysis to identify and correct any “bad” items, following procedures described in the Exam Information page of the Lecture Supplements, and post the results of the item analysis and any rescoring. I’ll post an announcement when the final feedback is available.

Choose the *best* answer to each of the following 50 questions. Questions are drawn from the text and lectures in roughly equal proportions, with the understanding that there is considerable overlap between the two sources. Usually, only one question is drawn from each major section of each chapter of the required readings; again, sometimes this question also draws on material discussed in class. Read the entire exam through before answering any questions: sometimes one question will help you answer another one.

Most questions can be correctly answered in one of two ways: (1) by fact-retrieval, meaning that you remember the answer from your reading of the text or listening to the lecture; or (2) inference, meaning that you can infer the answer from some general principle discussed in the text or lecture. If you cannot determine the correct answer by either of these methods, try to eliminate at least one option as clearly wrong: this maximizes the likelihood that you will get the correct answer by chance. Also, go with your intuitions: if you have actually done the assigned readings and attended the lectures, your “informed guesses” will likely be right more often than they are wrong.

A provisional answer key will be posted to the course website tomorrow, after the window for the exam has closed. The exam will be provisionally scored to identify and eliminate bad items. The exam will then be rescored with bad items keyed correct for all responses. Grades on the *rescored* exam will be posted to the course website. A final, revised, answer key, and analyses of the exam items, will be posted on the course website after grades are posted.

***This is a closed-book, closed-notes exam.***

1. Why have psychologists made more progress in understanding sensation than emotion?

- A. It is easier to make accurate measurements in sensation. \*\*
- B. Psychologists find sensation more interesting.
- C. Research on emotion is more expensive.
- D. The answers concerning emotion are so obvious that no research is necessary.

Chapter 1. First of all, the study of sensation began earlier than the study of emotion. But also, psychology, as a science, is dependent on quantification. Sensory stimuli and experiences, being relatively simple, are also relatively easy to measure. Emotions, and the events that give rise to them, are much more complicated.

2. What can a psychiatrist do that a clinical psychologist cannot do, in most states?

- A. prescribe drugs. \*\*
- B. conduct research.
- C. analyze dreams.
- D. hypnotize people.

Chapter 1. To become a psychiatrist, someone first earns an MD degree and then takes an additional 4 years of residency training in psychiatry. Because psychiatrists are medical doctors, they can prescribe drugs, such as tranquilizers and anti-depressants, whereas most psychologists cannot. However, in the United States, a few states now permit psychologists to prescribe drugs after completing a couple years of additional training.

3. Cognition can best be defined as

- A. emotional attachment.
- B. intense concentration.
- C. how we think and acquire knowledge. \*\*
- D. transmission between neurons.

Chapter 1. Cognition refers to thought and knowledge. The word *Cognition* contains the root *cogn-* which means "to know again." Cognitive psychologists study the processes of thought and knowledge and tend to focus on how people make decisions, solve problems, and convert their thoughts into language.

4. What do we call the process of looking within yourself to describe sensations and experiences?

- A. extrapolation
- B. intensification
- C. insightfulness
- D. introspection \*\*

Chapter 1. Introspection refers to "looking within yourself." It involves a detailed inquiry into your own experiences, beliefs, and sensations.

5. From around 1920 to 1970 research in psychology focused primarily on the study of
- A. the structure of the mind.
  - B. the meaning of dreams
  - C. observable behavior. \*\*
  - D. unconscious processes.

Chapter 1. From around 1920 to 1970, most researchers described psychology as the study of behavior (and nothing else). They concluded that questions about the mind and experience were unanswerable and, instead, focused on observable behaviors. John Watson systematized and popularized this approach—known as behaviorism—in the 1920s. This “behaviorist revolution” was in the forefront of psychology, until the 1960s when the so-called “**cognitive revolution**” (the study of thought and knowledge) began to take hold.

6. What is the essence of a psychological explanation of behavior?
- A. Behavior is caused by brain processes.
  - B. Behavior is caused by beliefs, feelings, and desires. \*\*
  - C. Behavior is a product of heredity and environment.
  - D. Behavior is a product of the interaction between the person and the situation.

Lecture 1. A psychological explanation of behavior explains an individual's action by invoking his or her mental states. It seeks to understand the nature of persons' beliefs (i.e. their cognitive state), feelings (i.e. their emotional state), and desires (i.e. their motivational state) and how they relate to each other, how they relate to what is going on in the brain and the rest of the body, and how they relate to the individual's behavior. This approach is considered by many to be folk psychology -- a set of naive, traditional ideas about the mind and behavior, unsupported by scientific evidence, that are doomed to be replaced by a more sophisticated, truly scientific view.

7. Which of these subfields of psychology would Wundt have classified as “*Geisteswissenschaft*”?
- A. Sensation and Perception.
  - B. Physiological Psychology
  - C. Learning
  - D. Social Psychology \*\*

Lecture 1. ***Geisteswissenschaft*** means “science of the spirit” -- where “spirit”, in this context, refers to so-called “higher” mental processes,” such as those studied in social psychology.

In Wundt's view, experimental psychology had to be limited to **basic** mental functions such as sensation and perception. “Higher” mental processes, such as memory and thought, were not susceptible to experimental investigation. They were too far away, as it were, from the instigating physical stimulus; and the underlying physiology was too complex. Scientific studies of sensation, perception, learning, and other physiological processes are considered ***Naturwissenschaft***, a German term meaning “science of nature”. These involved studies of **immediate** experience where the stimulus conditions can be tightly controlled and performance is very close to physiology.

8. What happens to an action potential as it travels along an axon?

- A. It increases in strength.
- B. It decreases in strength.
- C. It increases in speed.
- D. It remains constant. \*\*

Chapter 3. An action potential travels along an axon at constant strength—no matter how far it travels. It is a yes-no message, like turning on a light switch (a principle referred to as the all-or-none law).

9. After neurotransmitter molecules detach from their receptor, some of them diffuse away. What happens to the others?

- A. They enter the postsynaptic cell, which uses them for fuel.
- B. The presynaptic cell takes them back to use them again. \*\*
- C. They become part of the membrane of the postsynaptic cell.
- D. They break down into sodium and potassium.

Chapter 3. After a neurotransmitter excites or inhibits a receptor, it separates from the receptor ending the message. From this point on, one of three things can happen: It could return to re-excite the post-synaptic receptor, it could diffuse away from the synapse, or it could be reabsorbed by the axon that releases it (through a process called reuptake). Most anti-depressant drugs work by blocking this reuptake. This prolongs the neurotransmitter's effects. Neurotransmitters are merely chemical that activates receptors. The postsynaptic cell cannot use them for fuel (eliminating choice A), to build a membrane (eliminating choice C), or to break down sodium and potassium (eliminating choice D).

10. Which of the following would decrease the effects of cocaine, amphetamine, and Ritalin?

- A. phenylalanine, which decreases production of serotonin
- B. insulin, which increases fuel supply to the cells
- C. L-DOPA, which increases production of dopamine
- D. AMPT, which blocks production of dopamine \*\*

Chapter 3. The drug AMPT prevents the body from making dopamine. Cocaine, amphetamine, and Ritalin are stimulants that work by blocking the protein that the presynaptic neurons use to reabsorb dopamine after releasing them—prolonging the effects of the dopamine. However, if the neurons cannot make dopamine—as in the case of someone who took AMPT—the neurons cannot release dopamine and blocking dopamine reabsorption becomes irrelevant.

11. Under what circumstances can a split-brain person feel something and say what it is?

- A. only after feeling it with the left hand
- B. only after feeling it with the right hand \*\*
- C. after feeling it with either hand
- D. only after feeling it with both hands at the same time

Chapter 3. There are two ideas important to understanding phenomena in split-brain cases:

First, the left hemisphere controls the right hand, while the right hemisphere controls the left hand. Secondly, for MOST people, the left hemisphere is the “talking” side of the brain. So in order to for you to verbally describe something that your right hemisphere is experiencing, the information must pass quickly across the corpus callosum and to be processed by your left hemisphere. In split-brain cases, the corpus callosum is severed as is the connection between the right and left hemisphere. Thus, in order for such patients to verbally describe something they are feeling that object has to be in their RIGHT hand, which is controlled by the talking left hemisphere. They would not be able to describe objects in their left hand because their left hemisphere is controlled by the right hemisphere, which is non-verbal, and the information is unable to pass quickly to the left hemisphere.

12. If the heritability of something is high, which of these should we expect?

- A. Dizygotic twins resemble each other more than monozygotic twins do.
- B. Monozygotic and dizygotic twins resemble each other equally.
- C. Monozygotic twins separated at birth resemble each other. \*\*
- D. Adopted children resemble their adoptive parents and not the biological parents.

Chapter 3. Heritability is the estimate of variance within a population that is due to heredity. Monozygotic twins develop from a single fertilized egg (zygote) and therefore have identical genes—which makes them closer genetically than dizygotic twins, who are developed from a single egg and share only half of their genes. This suggests that if a trait is shared by monozygotic twins, it is likely a result of them sharing the same genes—in other words, the trait is highly heritable. If a trait is shared by dizygotic, it is less likely due to the sharing of genes—since the dizygotic twins share fewer genes than monozygotic twins. In this case, environment is likely to play some part in the experienced similarity of that trait.

13. The intensity of a stimulus can be coded by the:

- A. The magnitude of the excitatory potential of the neuron.
- B. The magnitude of the action potential of the neuron.
- C. The number of neurons firing simultaneously. \*\*
- D. The length of the refractory period following depolarization.

Lecture 2. Increasing stimulation has no effect on the magnitude of the impulse of any single neuron. In contrast, the intensity of a stimulus can be coded by two things (1) the rate at which single neurons fire and (2) the increasing involvement of adjacent neurons. Thus, the nervous system as a whole records intensity in terms of both the rate at which individual neurons discharge, and the number of individual neurons that are firing simultaneously.

14. Paraplegia affecting only the upper portion of the body (i.e., above the waist) is caused by a break in the:

- A. upper region of the spinal cord, such as the cervical division.
- B. middle region of the spinal cord, such as the thoracic division.
- C. lower region spinal cord, such as the lumbar division.
- D. none of the above. \*\*

Lecture 2. Paraplegia entails a loss of conscious sensation and voluntary movement in body sites served by spinal nerves that connect to the spinal cord below the site of the cut. Thus, a break in the middle or lower portion of the spinal cord would result in a loss of sensory and motor functions only in the lower part of the body, including the legs and feet. A break in the upper region would result in paralysis in BOTH the upper and lower portion of the body. Paralysis in just the upper portion of the body would have to be due to another condition (e.g. stroke), not a break.

15. The \_\_\_\_\_ controls \_\_\_\_\_.

- A. thalamus; the coordination of sensation with action.
- B. pons; biological motives
- C. limbic system; cortical arousal
- D. medulla; vegetative functions \*\*

Lectures 2, 3. The medulla is part of the lower portion of the brain stem. It controls vegetative functions involving the cardiovascular and respiratory systems. The pons (also known as the metencephalon) is important for regulating cortical arousal. The thalamus relays incoming sensory signals to the appropriate parts of the brain. The limbic system is involved in regulating emotion

16. Coma and the persistent vegetative state involve damage to the:

- A. cerebellum or lateral geniculate nucleus
- B. reticular formation or thalamus \*\*
- C. pons or hippocampus
- D. basal ganglia or amygdala

Lecture 3. In a coma, there is a general loss of consciousness, although vegetative functions are normal. The patient is not responsive to stimulation and shows no signs of emotion. The eyes are generally closed, as if in sleep, but electroencephalogram (EEG) shows that the normal sleep-wake cycle has disappeared. Persistent vegetative state often follows coma within a month if the patient does not recover. The patient's eyes may be open at times, and the sleep cycle is normal. But the patient is still unresponsive to stimulation. Both can result from bilateral damage to the thalamus, a structure in the forebrain). Both also result from damage to the reticular formation and other parts of the posterior brainstem.

17. A patient's speech is slow, labored, and inarticulate, but comprehensible. Her brain damage is probably localized in the:

- A. prefrontal cortex. \*\*
- B. motor projection area of the frontal lobe.
- C. junction of the temporal and parietal lobes.
- D. occipital lobe.

Lecture 4. If a patient's speech is nonfluent—slow, labored, inarticulate, and ungrammatical—but the person's speech behavior is sensible, they are suffering from Broca's aphasia, also known as expressive aphasia. Broca's (expressive) aphasia is associated with lesions in a site in the lateral frontal lobe known as Broca's area. (Note: it is near the motor cortex, but not in the motor cortex or the motor projection area of the frontal lobe--eliminating choice B.)

18. A patient has difficulty shifting attention from one region of space to another. His brain damage is probably localized in the:

- A. fusiform gyrus
- B. posterior cingulate gyrus
- C. parietal lobe
- D. frontal lobe. \*\*

Lecture 4. A portion of the parietal lobe (in conjunction with the frontal lobes) plays an important role in attention. Specifically, it aids in alerting the person to a particular stimulus. However, it is the frontal lobe that is involved in shifting attention from one region of space to another. The frontal lobe aids in the executive control required for this task. Specifically, it helps the person (1) disengage from the current object of attention, (2) move attention from one location to another, (3) engage in that new object, and (4) inhibit responses to other extraneous stimuli.

19. Lashley's "Law of Mass Action" states that:

- A. motor activity requires the coordination of the left and right hemispheres.
- B. motor activity requires the coordination of dorsal and ventral portions of cerebral cortex.
- C. long-term memories are represented by discrete clusters of neurons.
- D. long-term memories are represented by large ensembles of neurons. \*\*

Lecture 5. Lashley's Law of Mass Action states that any specific memory is part of an extensive organization of other memories. Therefore, individual memories are represented by ensembles of neurons that are distributed widely across the cortex. It is not possible to isolate particular memories in particular bundles of neurons, so it is not possible to destroy memories by specific lesions.

20. Scientists' preference for the theory that makes the fewest unfamiliar or untested assumptions is the principle of

- A. parsimony. \*\*
- B. statistical significance.
- C. normal distribution.
- D. informed consent.

Chapter 2. Parsimony (which literally means stinginess) is a principle that, when given a choice among explanations that seems to fit the facts, we prefer the one whose assumptions are fewer, simpler, or more consistent with other well-established theories. The principle of parsimony is a conservative idea: we stick with ideas that work and try as hard as we can to avoid new assumptions.

21. You find a difference between men and women at your college, but you wonder whether it is true for humans in general. To answer the question, which kind of sample would be best?

- A. A random sample of the population
- B. A representative sample of the population
- C. A convenience sample
- D. A cross-cultural sample \*\*

Chapter 2. A representative sample, which is a sample that resembles the population in its percentage of various demographic characteristics, is an improvement over a convenience sample (i.e. a group chosen because of its ease of study). A random sample—that is, one in which every individual in the population has an equal chance of being selected—is even better. However, if you want to apply results to all humanity in general—not just one culture—you would need a cross-cultural sample, which would include groups of people from multiple cultures. Thus, choice D is the best choice.

22. According to a recent survey, 78% of workers say they have cheated their employer. Before we can interpret these results, which of the following questions is most important to ask?

- A. Did the workers admit to other misconduct also?
- B. What were the independent variables in this study?
- C. What were the participants told to count as examples of cheating? \*\*
- D. Were the participants randomly assigned to groups?

Chapter 2. Whenever you hear the results of a study, you should ask yourself how the questions were worded and what choices were offered. Even a slightly different wording could yield a different percentage. The questions of a survey might even be worded in a certain way to encourage participants to answer in a particular way.

23. An experimenter had people exercise much, a little, or not at all and then measured how much they ate at dinner. What was the independent variable?

- A. the type of food offered
- B. the delay between exercise and dinner
- C. the amount of exercise \*\*
- D. the amount of food eaten

Chapter 2. The independent variable is the item that an experimenter controls or changes. In this case, the experimenter changes the amount of exercise a person is receiving.

24. The Lizard Lick State Fighting Nematodes scored 50, 50, 55, 60, and 85 points in their first five basketball games. What was their median score?

- A. 50
- B. 55 \*\*
- C. 60
- D. 85

Chapter 2. The median is the middle score of a group of numbers arranged from highest to lowest. In this case, 55 is the middle score when the scores are arranged from highest to lowest. The median may best represent the typical score in a group of numbers when their distribution is not symmetrical.



25. In a class of 49 students, an exam score has a mean of 70 and a standard deviation of 10. Which individual student's score is most likely to be an unrepresentative "outlier"?

- A. 90.
- B. 48. \*\*
- C. 83.
- D. 56.

Lecture 6. Outliers are scores that fell outside the confidence interval (i.e. 2 standard deviations around the mean). In this case, any score below 50 (i.e.  $70 - 10 - 10 = 50$ ) or above 90 (i.e.  $70 + 10 + 10 = 90$ ) would be considered outliers. 48 meets these criteria!

26. The American military employs the Armed Services Vocational Aptitude Battery (ASVAB) to assign new recruits to various jobs, such as clerical, mechanical maintenance, and food preparation. Candidates are also interviewed before assignment. Assuming that the ASVAB is valid for personnel selection, a manager should base her assignments on:

- A. the pattern of ASVAB scores only. \*\*
- B. ASVAB scores plus subjective impressions based on the interview.
- C. the interview only, because personal contact generally provides more reliable information than objective test scores.
- D. We cannot tell in advance, without knowing how skilled the manager is at interviewing applicants.

Lecture 6. If the ASVAB is indeed valid, we can assume that it measuring what it claims to measure. In addition, research by Meehl demonstrated that statistical predictions were generally superior to impressionistic human judgments and have been confirmed by every analysis performed since then. Thus, when it comes to predicting future events, nothing beats the power of actuarial statistics. Given this, the ASVAB scores are likely to be the best predictor for effective personnel selection.

27. Your clock makes a clicking sound just before the alarm goes off. Even though you didn't wake up to the clicking sound initially, now you do, due to classical conditioning. The loud alarm is a/an

- A. unconditioned stimulus. \*\*
- B. unconditioned response.
- C. conditioned stimulus.
- D. conditioned response.

Chapter 6. A unconditioned stimulus is an event that automatically elicits an unconditioned response. In this case, the alarm is the unconditioned stimulus because it automatically elicits you to wake up without any training taking place. Waking up (to the alarm) is the unconditioned response. After the training, the clicking sound becomes the conditioned stimulus, because your response to it depends on proceeding condition—this is, your response to it depends on pairing it with the unconditioned stimulus (the alarm). Waking up (now to the clicking sound) becomes the conditioned response since it is now elicited by the conditioned stimulus (the clicking) due to the training.

28. Pavlov believed that presenting the CS at nearly the same time as the UCS caused a connection in the brain to form so that the animal treated the CS as if it were the UCS. Which of these is evidence AGAINST that theory?

- A. Conditioning occurs more rapidly with unfamiliar CSs than with familiar CSs.
- B. A conditioned response generalizes to other stimuli similar to the CS.
- C. Conditioning occurs more rapidly with intense UCSs than with weak UCSs.
- D. The CR does not always resemble the UCR. \*\*

Chapter 6. Pavlov believed that presenting the CS at nearly the same time as the UCS caused a connection in the brain to form so that the animal treated the CS as if it were the UCS. In other words, He believed that UCS excited a UCS center somewhere in the animal's brain, which immediately stimulates the UCR center. After the pairing of the CS and the UCS happens, the CS excites the CS center, which excites the UCS center, which then excites the UCR and produces a response. This theory does not allow for alternative responses, which is a problem because, in studies with rats that automatically jump when administered a shock, the conditioned stimulus paired with the shock causes the rats to freeze—not jump. Studies like this suggest that the CR does not always resemble the UCR. Thus, providing evidence that Pavlov's theory is not true.

29. When an animal hears a bell, it sits up on its hind legs and drools. Then it receives food. What kind of conditioning is this?

- A. Classical conditioning
- B. Operant conditioning
- C. We don't have enough information to answer the question. It depends on whether the food always occurs after the bell, or only if the animal sits up. \*\*
- D. We don't have enough information to answer the question. It depends on what type of animal this is, and what type of food.

Chapter 6. In operant conditioning, the subject's behavior produces an outcome that affects future behavior—the subject has to make some responses to receive a reinforcement. In classical conditioning, the subject's behavior has no effect on the outcome—two stimuli at presented at the same time regardless of what the subject does. So in the case described above, it would be considered classical conditioning if the rat automatically sat up and drooled when presented with the food and the food is presented at the SAME TIME the bell is rung (regardless of the rat's response) during the training. If the rat is reinforced with food AFTER it sits up and drools, this is operant condition, because the rat has to give a response to get the reward.

30. Negative reinforcement is a procedure in which a response

- A. is weakened because it leads to the omission of a favorable stimulus.
- B. is strengthened because it removes an unfavorable stimulus. \*\*
- C. is weakened because it leads to an unfavorable stimulus.
- D. is weakened because it is followed by nothing.

Chapter 6. In negative reinforcement, a response is strengthened because it removes an unfavorable stimulus. Reinforcement INCREASES the probability of a behavior. Choice A and C refers describes punishment. Punishment DECREASES the probability of a behavior. Choice D describes extinction, which occurs with responses stop producing reinforcement.

31. What happens during vicarious reinforcement?

- A. You experience an event previously associated with an unconditioned reinforcer.
- B. You experience an event that has both reinforcing and punishing properties.
- C. You watch someone else do something and receive reinforcement. \*\*
- D. You receive a reinforcement but fail to pay attention to it.

Chapter 6. In vicarious reinforcement, you are substituting someone else's experience for your own. So you are watching someone else doing something and receiving reinforcement and, as a result, you are likely to do that something in order to receive reinforcement. Advertisers depend on vicarious reinforcement to sell their product by showing happy people using their product. The implication is that you will try to use their product to also be happy.

32. Instincts and other evolved behavior patterns are limited in that:

- A. they cannot affect the operation of individual muscles.
- B. they do not permit the organism to respond to environmental stimuli.
- C. they do not permit individuals to respond quickly to environmental changes. \*\*
- D. they do not create permanent changes in behavior.

Lecture 7. Instincts are extremely limited. They have been shaped by evolution to enable the species to fit a particular environmental niche, which is fine so long as the niche doesn't change. When the environment *does* change, evolution requires an extremely long time to change behavior (or body morphology, for that matter) accordingly -- much longer than the lifetime of any individual species member.

33. The speed of acquisition of a conditioned response:

- A. proceeds at a constant pace from start to finish.
- B. begins slowly, picks up speed, and then tapers off to a plateau. \*\*
- C. begins rapidly, then slows down before approaching a plateau.
- D. determines how much spontaneous extinction will occur during discrimination learning.

Lecture 8. The characteristic curve portraying the acquisition of the CR is an **ogive**, in which there is a slow increase in response strength on the initial trials, followed by a rapid increase in middle trials, and a further slow increase (i.e. a plateau) in the last trials.

34. A partial reinforcement schedule:

- A. speeds extinction in both classical and instrumental conditioning.
- B. speeds extinction in classical conditioning but retards extinction in instrumental conditioning.
- C. retards extinction in classical conditioning but speeds extinction in instrumental conditioning.
- D. retards extinction in both classical and instrumental conditioning. \*\*

Lecture 8. Different reinforcement schedules can result in a different pattern of behavior. In a continuous reinforcement schedule, reinforcement is delivered after every CR. In a partial reinforcement schedule, reinforcement is occasionally withheld. Partial reinforcement retards both acquisition and extinction in classical conditioning (where a CS and paired with a UCS) and instrumental conditioning (where the acquisition of a conditioned response happens by means of reinforcement)

35. Garcia's experiment on taste-aversion learning (bait shyness) undermines all of the following *except*.

- A. the principle of arbitrariness (equipotentiality).
- B. association by contiguity.
- C. Thorndike's Law of Exercise.
- D. the idea of the passive organism. \*\*

Lecture 9. In his experiment on taste-aversion (bait shyness), Garcia learned that animals formed associations between shock and sight and sound (but not taste), and between nausea and taste (but not sight and sound). This outcome violates the **arbitrariness assumption** of traditional S-R theories of learning because all elements of the compound CS occur at precisely the same time and place. Thus, they all have precisely the same spatial and temporal contiguity with respect to the US. Therefore, under the assumption of arbitrariness or equipotentiality, they should all have been as equally powerful as CSs. But they were not. It violates the assumption of **association by contiguity** because *all* the elements of the compound CS were presented simultaneously. Therefore, all elements of the compound CS were equally contiguous with the US -- temporally contiguous because they occurred close together in time; and spatially contiguous, because they occurred close together in space. But despite being equally contiguous, not all potential CSs acquired the power to evoke a CR. It also violates Thorndike's **Law of Exercise**. Thorndike concluded that stimulus-response associations are strengthened with repetition, but Garcia's rats formed strong taste-nausea associations after only a single trial. If evolution has predisposed rats to form associations between the taste of food and its gastrointestinal consequences, it has also predisposed rats to form these associations quickly and over long delays. It does not violate the idea of the **passive organism**—which states that the organism is not active during learning—because all the action is assumed to be in the environment, which stamps in associations with the contiguous stimuli (i.e. in the sweet, noisy, or bright water) and responses (i.e. the avoidance). It is assumed that the rats are not acting with free will.

36. Backwards conditioning shows that:

- A. stimulus-response associations are bidirectional.
- B. conditioning cannot occur when the CS is more salient than the US.
- C. conditioning only occurs when the CS provides information about the US. \*\*
- D. generalization occurs to redundant CSs.

Lecture 9. In backwards conditioning, the onset of the CS actually follows the onset of the US. The CS and the US are still highly contiguous in terms of the spatial and temporal relations between them. However, conditioning is actually inhibited. This suggests that conditioning occurs when the CS acts as a signal that the US is forthcoming. In other words, conditioning only occurs when the CS informs the animal (provides information) that the US is coming.

37. Learned helplessness occurs because the organism learns that important environmental events are:

- A. predictable.
- B. unpredictable.
- C. controllable.
- D. uncontrollable. \*\*

Lecture 10. Learned helplessness reflects the acquisition of negative expectations of control. If an animal is put in a situation where they are not able to escape shock they will learn to passively accept the shock while showing signs of distress. They will make few escape or avoidant responses even when put into another situation where escape from the situation is possible. The animal acquires a negative expectation that nothing can be done about the shock.

38. Tolman's experiments on "latent learning" show that:

- A. organisms can form associations between prepared stimuli.
- B. organisms can learn in the absence of reinforcement. \*\*
- C. extrinsic motivation is stronger than intrinsic motivation.
- D. observational learning is best when the model is unrelated to the learner.

Lecture 10. In his experiment on latent learning: one group of rats were rewarded every trial with food and showed a gradual reduction in errors, a second group received no reward and showed no reduction in errors, and a third group did not receive a reward until Trial 11 of the experiment after which they showed an immediate reduction errors. Tolman concluded that the animals in this group learned how to get from the start box to the goal box on the first 10 trials, but just needed a reason to do it. This reason was provided on Trial 11 and subsequent trials. In other words, Tolman's animals learned the maze without any reinforcement. Over 10 trials of exploration, they developed a "mental map" of their environment, which was subsequently available for use for a variety of purposes. However, they didn't perform a goal-directed response until the introduction of reinforcement established a goal. Reinforcement controls performance rather than learning.

39. In older people, the lens of each eye becomes less flexible. How does that change their vision?

- A. They have more trouble adapting to dim light.
- B. They have more trouble focusing on nearby objects. \*\*
- C. Objects toward the periphery of the visual field look smaller than before.
- D. Colors appear less bright than before.

Chapter 4. The flexibility of the lenses enables the eye to accommodate—that is, to adjust its focus for objects at different distances. As a result, as the lenses lose their flexibility, older people have more trouble focusing on nearby objects.

40. Why was the discovery of color vision deficiency theoretically important?

- A. It showed the importance of early experience in visual development.
- B. It showed that color is necessary for object recognition.
- C. It showed that color is in our brains, not in the light itself. \*\*
- D. It showed that special experiences can help people overcome genetic predispositions.

Chapter 4. Many centuries ago, people assumed that anyone who was not blind could see and recognize colors. However, during the 1600s, color vision deficiency (e.g. when people have difficulty distinguishing reds and greens for genetic reasons) was recognized. This provided the 1<sup>st</sup> clue that color vision is a function of both our eyes and brain and not just light itself. Color vision depends on the response rate of three cones. Red-green color deficient people have only short wavelength (blue) cones and either the long-wavelength (red) or medium-wavelength (green) cones.

41. Our ability to distinguish one high-frequency sound from another—for example, 8000 Hz from 9000 Hz—depends on

- A. which part of the basilar membrane has hair cells with the greatest activity. \*\*
- B. the frequency of action potentials produced by each axon in the auditory nerve.
- C. differences in response between cells in the left ear and cells in the right ear.
- D. differences in the velocity of individual action potentials of the auditory nerve.

Chapter 4. We distinguish low frequencies below 100 Hz via the frequency principle (choice B): the frequency of action potentials produced by each axon in the auditory nerve. We distinguish frequencies between 100 Hz and 4000 Hz via the volley principle: volleys (that is, groups) respond to each vibration with an action potential. We distinguish HIGH frequency sounds via the place principle (choice A): which is when frequency distinction depends on which part of the basilar membrane has hair cells with the greatest activity. Higher frequencies vibrate hair cells near the stirrup ends, while lower frequencies vibrate hairs at points farther along the membrane.

42. When would a phantom hand sensation be strongest?

- A. late in the evening, shortly before bedtime
- B. on cold, wintry days
- C. after a particularly heavy meal
- D. when something touches the face \*\*

Chapter 4. In phantom hand sensations, the hand area of the cortex becomes inactive after the hand is amputated because the axons from the hand become inactive. As time passes on, the axons from the face strengthen connections to the nearby by hand area of the cortex. As a result, stimulation of the face activates both the face AND hand area...producing the phantom hand sensations.

43. Many optical illusions result from the fact that

- A. light rays of different wavelengths travel at different velocities.
- B. the lens of the eye distorts the shape of objects near the periphery of vision.
- C. the human eye is slightly elongated instead of being spherical.
- D. we tend to interpret 2-dimensional displays as if they had depth. \*\*

Chapter 4. An optical illusion is a misinterpretation of visual stimulus. An optical illusion can occur when a two-dimensional drawing offers misleading depth cues. Because of our experience with photos and drawings, our brains are trying to interpret these drawings as three-dimensional.

44. Why are the skin senses (touch, temperature, cutaneous pain) problematic?

- A. We don't know what the proximal stimuli are for touch, temperature, and cutaneous pain.
- B. It is hard to distinguish between the distal and proximal stimulus.
- C. The receptor organs are identical in these modalities.
- D. They all seem to project to the same areas of the brain. \*\*

Lecture 11. In the skin senses, distal stimulus makes contact (more or less) with the surface of the skin, stimulating receptors buried underneath. The skin senses include the tactile sense, the thermal sense, and the sensation of pain. The skin senses are very complex. At least seven different nerve endings are found in the skin, but there is little isomorphism (one-to-one relation) between the type of receptor and the corresponding sensory experience when that receptor is stimulated electrically. To make things worse, neural impulses from all six receptor types are transmitted along the same afferent tracts to the spinal cord and up to the brain, and all project to the same somatosensory cortex in the parietal lobe. So the puzzle is: how are the skin senses kept separate? Pain is even more complex because it is both a sensation and a perception.

45. The Young-Helmholtz "trichromatic" theory of color vision is troubled by the fact that \_\_\_\_\_ is perceived as a pure color.

- A. red
- B. yellow \*\*
- C. blue
- D. green

Lecture 12. The trichromatic theory, also known as the Young-Helmholtz theory, gets its name from the idea that there are three types of cones, each maximally sensitive to one of three primary colors: "red" (sensitive to long wavelengths), "blue" (sensitive to short wavelengths), and "green" (sensitive to medium wavelengths). According to this theory, yellow would come from a mixture of red and green, and this is what Young and Helmholtz thought, but the problem is that yellow is perceived as a pure color, not a mixture.

46. According to Fechner's Law, changes in sensation \_\_\_\_\_ with respect to changes stimulation.

- A. grow more slowly \*\*
- B. are isomorphic
- C. grow more rapidly
- D. We cannot state Fechner's law with precision unless we know the sensory modality.

Lecture 13. According to Fechner's Law, sensation changes more slowly than stimulation. The formula for this law is  $S = k(\log I)$ , where  $S$  = sensory intensity;  $I$  = physical intensity;  $k$  = a constant; and  $\log$  = a logarithmic function. As stimulation grows from 1 to 200 units, sensation grows only from 0 to 2.3 units). If 1 unit of stimulation equaled 0 units of sensory intensity, 10 units of stimulation would equal 1 unit of sensory intensity, while 100 units of stimulation would only equal 2 units of sensory intensity. So, 10 additional units of stimulation make a big difference to sensation at the bottom end of the scale, but a progressively smaller difference as we move towards the top.

47. In a signal-detection experiment, subjects will adopt a conservative response bias when:

- A. the payoff matrix is balanced.
- B. the observer has lower sensitivity
- C. the number of catch trials is increased. \*\*
- D. the observer is penalized for misses.

Lecture 13. Signal detection theory takes into account both the sensitivity of the nervous system and the decision criterion set by the observer, reflecting his or her goals and expectations. In the basic signal detection experiment, a stimulus, or signal, is presented against a background of noise. Some trials present both signal and noise, others present just noise (these are known as catch trials); and the task of the subject is to say, on each trial, whether the signal is present. The task is made fairly difficult by the fact that the signal is just slightly more intense than the noise. This situation injects considerable uncertainty into each trial. Within this framework, the observer's expectations are manipulated by varying the proportion of catch trials. If there are relatively few catch trials, subjects will be biased toward saying "yes" even when they are uncertain (a liberal response bias), since the signal is usually present. If there are relatively many such trials, they will be biased toward saying "no" (a conservative response bias). In other words, subjects will adopt a conservative response bias when the number of catch trials is increased.

48. As a cue to depth or distance, superposition is

- A. ocular and binocular.
- B. ocular and monocular.
- C. optical and binocular.
- D. optical and monocular. \*\*

Lecture 14. Superposition refers the concept that if one object cuts off the observer's view of another object, the former is closer to the observer than the latter. This is optical in nature because that distance information is provided by the light falling on the retina (i.e. It is optical). You are not using your eyes muscles to perceive the depth (i.e. it is not ocular; ruling out choices A and B). You also able perceive the depth even when you only use one eye. It is monocular (indicating choice D). You do not need both eyes to perceive it (ruling out choice C).

49. According to the information-processing view of perception:

- A. there is a critical period for learning to detect features in the environment.
- B. pattern recognition can be influenced by "top-down" processes. \*\*
- C. there are "grandmother cells" for detecting the presence of meaningful stimuli.
- D. expectations acquired through learning have no influence on perception.

Lecture 15. The information processing view compares the human brain to a computer. Information from past experience is processed, coded, and stored. This is a "top-down" process since it involves conceptual information coming from central structures. We recognize patterns of features as meaningful, because, in this top-down process, knowledge is derived from previous experiences and retrieved from memory.



50. According to the constructivist view:

- A. perception is determined by the information provided by the stimulus.
- B. the perceiver must go beyond the information given by the stimulus. \*\*
- C. perceptual schemata are determined by “bottom-up”, automatic processes.
- D. the stimulus field is very rich and highly structured.

Lecture 16. According to the constructivist view perception isn't given by the stimulus but rather is actively constructed by the perceiver. Thus, the perceiver must go beyond the information given by the stimulus.