MEMORANDUM

Date: December 18, 1991
To: Undergraduate Education Committee
From: Ray Hyman
Topic: Psy 435/535 Cognition

Enclosed is a copy of the course syllabus. I have also included the study guides for both the midterm and the final examination as well as copy of the final examination.

Please note that the examinations consist of both multiple choice items and an essay. The course is designed around what I call Topics, Themes, and Pointers. Topics are the various subject matters covered in cognitive psychology such as perception, attention, memory, reading, comprehension, language, the brain, and the like. They usually correspond to chapter headings and subheadings in textbooks. Themes are key principles and psychological processes that cut across topics and help unify the diverse topics of cognition. Examples of important themes stressed in this course would be contributions of observer and environment, bottom-up and top-down processing, controlled vs automatic processing, allocation of limited resources, etc. Pointers are demonstrations or key experiments that illustrate one or more key themes.

Both the essay questions and the term paper are built around pointers. The students choose pointers to bring out central themes and to develop a characterization of human cognition.

A course in cognition has a peculiar status in a psychology curriculum. For each topic covered--perception, memory, skills, language, thinking--a separate course already exists. The textbooks cover each of these topics in 20 or 30 pages. For those students who have had a course in brain and behavior, the chapter on the neural basis of behavior merely repeats a few notions that they have already studied in greater detail. For those students who have not had such a course, the same chapter is essentially useless. The same can be said for the other topics.

So why have a separate course called `cognition'?. The only excuse, as I see it, is to show a common pattern or theme that cuts across these separate topical areas. The textbooks fail to do this adequately. After the token introductory chapter, each topic is presented with little emphasis on what it shares with the other topics.

I see my role as instructor as that of integrating the separate topics. I do this by building the course around a small set of themes that cut across all the separate topics. Not all students like this emphasis. They learn the names for the themes but have trouble developing adequate mental models of how these themes operate within each of the topics. Those students who do succeed tell me that the course was very rewarding.

Psy 435/535
COGNITION
Syllabus Fall 1991

1. <u>General Information</u>

    1.1 Catalog Details: Psy 435 TLN 5574/ Psy 535 TLN 5584 Classes meet: 8:00-9:20am UH 146 Straub

    1.2 Instructor: Ray Hyman, 323 Straub, 346-4910. Office Hours: M 2:00-3:30pm/ F 1:00-2:30pm
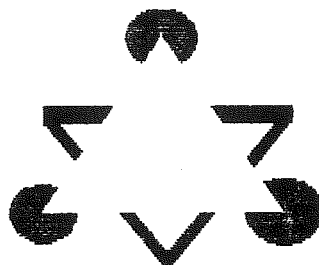
    1.3 Textbook: Anderson, J. R. (1990). <u>Cognitive Psychology and Its Implications</u> (Third Edition).

    1.4 Examinations: MIDTERM: Oct 29, 1991 FINAL: Dec 11, 1991 @ 8:00am.

    1.5 Term Paper: The term paper on Tuesday, Dec 3, 1991. Papers handed in after this deadline will either be marked down or not accepted.

Subjective Contours

Topics & Assignments

Week	Lectures	Topics	Assignments
1	Sep 24,26	Cognition, Cognitive Science & the Brain	Ch 1, Ch 2
2	Oct 1, 3	Perception/Attention	Ch 4
3	Oct 8,10	Representation: Imagery, Meaning	Ch 4, Ch 5
4	Oct 15,17	Memory: Elaborations and Inference	Ch 6, Ch 7
5	Oct 22,24	Review, PQ4R	
	Oct 29	**MIDTERM EXAMINATION**	
6	Oct 31	Problem Solving	Ch 8
7	Nov 5,7	Expertise	Ch 9
8	Nov 12,14	Logic & Reasoning	Ch 10
9	Nov 19,21	Language & Comprehension	Ch 11,12
10	Nov 26	Development & Intelligence	Ch 13,14
11	Dec 3,5	Review	Term paper due Dec 3
	Dec 11	FINAL EXAMINATION, Wednesday, 8:00-10:00am	Bring #2 pencils and blue books

Comments

The examinations will be half multiple choice and half essay in format. The topic for your term paper can be any subject or issue discussed in lectures or textbook. You will be given no credit for a paper unless it explicitly uses themes and discusses issues covered in the course. Please look at the dates for the examinations. If you cannot be in class on those dates, take this course during another term.

PSY 435/535:COGNITION MIDTERM FALL 1991

Study Guide

This study guide contains <u>topics, themes, and pointers</u> from the textbook and the lectures. The distinction between the three types of items is somewhat arbitrary. Some items can equally be members of more than one category.

The midterm examination will consist of 30 multiple choice items and a 15-minute essay question. The essay question will provide you a choice of two out of five pointers. To insure the best grade you should choose your two pointers to bring out as many different principles as possible about cognition. For example, if you were given the pointers *THE CAT, FILTERED SPEECH, AND BLONDLOT*, you would be unwise to choose the first two items because they both emphasize the same major theme.

The examination will be during the regular class time on October 29, 1991. *Please bring a sharpened #2 pencil as well as a blue book or blank notepaper for your essay answer.*

TOPICS

ABSOLUTE THRESHOLD
ATTENTION
THE BRAIN
CATEGORIZATION
COGNITIVE PSYCHOLOGY
HISTORY OF COGNITIVE PSYCHOLOGY
IMAGERY
LONG TERM MEMORY
MEMORY
MENTAL MAPS
NEURAL BASIS

PATTERN RECOGNITION
PERCEPTION
POISSON DISTRIBUTION
PQ4R
REPRESENTATION
SENSORY MEMORY
THE STANDARD MODEL
THEORY OF SIGNAL DETECTION
WORKING MEMORY

THEMES

ACTIVATION/STRENGTH
ANCHORING
ASSIMILATION/CONTRAST
ATTENTION/ALLOCATION OF RESOURCES
AUTOMATIC/CONTROLLED PROCESSES
AVAILABILITY
BOTTOM-UP AND TOP DOWN PROCESSING
CHUNKING
CONNECTIONISM
CONTEXT
CONTRIBUTIONS (OBSERVER, ENVIRONMENT)
CRITERION/SENSITIVITY
DUAL CODE THEORY
ENCODING SPECIFICITY/ENCODING VARIABILITY
FIGURE/GROUND
IMPLICIT MEMORY
INFORMATION PROCESSING
INFORMATION COMPRESSION
INTERFERENCE/DECAY
LIMITS/DATA
LIMITS/RESOURCE
MEANING
MENTAL MODELS
METACOGNITION
MORE/LESS
NETWORKS
OVERCOMING LIMITS
PERCEPTION/IMAGINATION
PROPOSITIONS
PROPOSITIONAL REPRESENTATIONS
RECOGNITION/RECALL
REHEARSAL/ELABORATION
REHEARSAL/MAINTENANCE
REPRESENTATION

REPRESSION
REPRODUCTIVE/RECONSTRUCTIVE
SCHEMAS
SCRIPTS
SIGNAL/NOISE
SPATIAL/LINEAR
TYPE I ERROR/TYPE II ERROR
UNCONSCIOUS INFERENCE

POINTERS

7C-7S
BARTLETT
BLONDLOT AND N-RAYS
BOOMERANGS
BROOKS
DIVIDED ATTENTION STUDIES
DOMINO
EBBINGHAUS
EYE-CHART DEMONSTRATION
FECHNER
FILTERED SPEECH
Fs
HECHT-SHLAER-PIRENNE
IMAGE SCANNING
INVISIBLE RECTANGLE
MENTAL MAPS
MENTAL PAPER FOLDING
MENTAL ROTATION
MNEMONIC SYSTEM
PARTIAL-REPORT PROCEDURE
PHONEME-RESTORATION EFFECT
PSYCHOPHYSICS
RAUDIVE VOICES
RODS/CONES
THE CAT
WORD SUPERIORITY EFFECT

MIDTERM EXAMINATION

This examination consists of two parts. Part I contains 30 multiple choice questions. Record your answers on the special answer sheets with a number 2 pencil. Make sure to place your name and your ID number on the answer sheet. Part II provides you with a choice of two pointers from a list of five. You will use your chosen pointers to write an essay about cognitive psychology and its important themes.

PART I: MULTIPLE CHOICE (30 POINTS)

1.   An information-processing analysis:
   A.   Tries to find the neural elements underlying various cognitive processes
   B.   Attempts to identify the stages involved in performing a cognitive task
   C.   Attempts to identify what information we need to know in order to do a cognitive task
   D.   Looks at the constraints the environment imposes on how we perform a cognitive task

2.   The demonstration of the "invisible rectangle" illustrated the theme of
   A.   Information-processing   C. Resource limits
   B.   Metacognition   D. Data limits

3.   The mental paper folding demonstration illustrated
   A.   Bottom-up processing   C. Chunking
   B.   Anchoring   D. Information compression

4.   One neuron communicates with another by:
   A.   Sending electrical charges across the synapse
   B.   Sending chemical patterns across the synapse
   C.   Sending neural transmitters across the synapse
   D.   Sending terminal boutons across the synapse

5.   The corpus callosum is the
   A.   Pathway of fibers that connects the left and right hemispheres
   B.   Pathway of fibers that connects the various lobes of the cortex
   C.   Part of the brain involved in vision
   D.   Part of the brain involved in language

6.   Sensory memory
   A.   Has a very large capacity
   B.   Has a very long duration
   C.   Is limited to approximately 7 items
   D.   Consists of mental representations that are perceptually-based

7.   The contrast between the whole-report procedure and the partial-report procedure shows that
   A.   Subjects recall more if we ask them to recall more
   B.   Subjects recall less if we ask them to recall more
   C.   Subjects can register more elements than they can report
   D.   Subjects can report more elements than we can measure

8. The standard model of cognition is
   A. The current best account of human cognition
   B. Assumes parallel processing
   C. Basically a bottom-up system
   D. Basically a top-down system

9. The pointer 'T-H-E C-A-T' shows that information processing
   A. Is based on feature analysis
   B. Is top-down
   C. Requires the cooperation of bottom-up and top-down processing
   D. Must overcome resource limits

10. Most of the class missed counting the Fs in the word 'of' because of
    A. Resource limits
    B. Data limits
    C. Metacognition
    D. The fan effect

11. The standard model assumes
    A. Only two memories
    B. Serial processing
    C. Unlimited capacity
    D. Information is represented as images

12. The eye-chart demonstration illustrated
    A. Assimilation/contrast
    B. Bottom-up processing
    C. Perceptually-based representation
    D. Problems of measuring thresholds

13. Fechner created psychophysics to show that
    A. Everything was mental
    B. Everything was material
    C. The observer always makes a contribution
    D. Cognition was necessary

14. Hecht and his colleagues discovered that the threshold for having a visual experience of light occurs when
    A. The light falls upon the cones
    B. Approximately 100 light quanta are absorbed by the retina
    C. Approximately 7 light quanta are absorbed by the retina
    D. The observer sets a low criterion

15. A false alarm is also known as
    A. An error of habituation
    B. A miss
    C. A Type I Error
    D. A Type II Error

16. What is the best evidence that in rotating two objects into congruence, subjects *continuously* transform one of the objects until it is in congruence with the other? That is, which result is the best evidence for continuity?
    A. There is little difference between rotating objects in the picture plane versus the depth plane
    B. Judgment time is a linear function of the number of degrees of rotation required to complete the rotation
    C. Subjects find it hard to recognize that one object is larger than the other
    D. Subjects are much faster to rotate simple letters than complex figures

17. Which of the following would be evidence that images are tied to the visual modality?
    A. People report being able to see pictures in their head
    B. Visually scanning an array of objects interferes with making judgments about an imaged block letter F, but tactually scanning an array of objects does not
    C. There are systematic distortions in our memory for maps such that our judgments of the relative locations of cities is influenced by our knowledge of the relative locations of the states in which the cities are contained
    D. People can rotate in their mind mental images of objects

18. An experiment was run in which subjects were asked to remember a map and then judge which of the two cities was farther north or which of the two cities was farther east. Which of the following should affect the time it took them to make these judgments?
    A. Whether they were making a judgment about which city is farther north or which is farther east
    B. Whether the city is on a river
    C. Whether the map has a border or not
    D. Whether there is a state border between the two cities - i.e., whether the two cities are in different states

19. Which of the following is a distinction between propositions and schemas?
    A. Propositions can be forgotten whereas schemas cannot
    B. Propositions encode the abstract meaning of events whereas schemas encode the visual characteristics of events
    C. Propositions encode precise assertions whereas schemas encode general features of objects and events
    D. Propositions are linearly structured whereas schemas are hierarchically structured

20. Scripts are schemas which:
    A. Are used in plays
    B. Encode our knowledge of a movie
    C. Are used in restaurants
    D. Encode our knowledge of stereotypic sequences of actions

21. The 'boomerangs' illustrate
    A. Anchoring   C. Implicit memory
    B. Chunking   D. Assimilation/contrast

22. The distribution which provides a good approximation of rare events such as the yearly number of deaths from mule kicks in the Prussian Army is the
    A. Poisson   C. Chi square
    B. Normal   D. Hypergeometric

23. Dark light refers to
    A. The criterion
    B. What happens when quanta are absorbed by cones
    C. The visual experience created by random firings of neurons in the optic nerve
    D. The increased visual sensitivity due to dark adaptation

24. Response bias is a result of
    A. Low sensitivity
    B. Neural noise
    C. A high threshold
    D. Setting a high or low criterion

25. Activation refers to:
    A. A relatively temporary attribute of memory structures
    B. A relatively permanent attribute of memory structures
    C. A method for numbering information
    D. The effect of emotion on memory

26. Suppose subjects are presented with a list of words including items like "woman." Which task will most benefit from rote (as opposed to elaborative) rehearsal?
    A. Recall memory for "woman"
    B. Recognition memory for "woman"
    C. Ability to complete the word fragment "wo___" with "woman"
    D. Ability to relearn the list at a later date

27. Blondlot claimed that when he placed his hand between the N-ray source and the spark gap that
    A. The spark became noticeably dimmer
    B. The spark became noticeably brighter
    C. The spark's intensity did not change
    D. He could see through his hand

28. Lashley believed that memory
    A. Was localized in the temporal lobes
    B. Was located in the left hemisphere
    C. Was not localized in any particular part of the brain
    D. Was located in the engram

29. People who suffer amnesia for who they are show an impairment of
    A. Episodic memory   C. Iconic memory
    B. Semantic memory   D. Working memory

30. Mnemonic systems work because
    A. They focus on rote memory
    B. They engage procedural memory
    C. They require elaborative rehearsal
    D. They require maintenance rehearsal

PART II: ESSAY (20 POINTS)

Choose *two* of the following pointers. Briefly explain what each pointer is and what important themes it illustrates. Then explain how these themes combine to explain how human cognition works. Try to choose your two pointers so as to bring out as many different and important themes as possible.

<div align="center">

7C - 7S
BLONDLOT & N-RAYS
EBBINGHAUS AND BARTLETT
FILTERED SPEECH
THE DOMINO AND HOW MANY Fs

</div>

Study Guide

This study guide lists <u>topics, themes, and pointers</u> from the textbook and the lectures. They include most of the content of the course that will be tested in the final examination. All but one of the multiple choice questions deal with the material covered since the midterm examination. The examination will consist of 60 multiple choice items and an essay question. For the essay, you will be given a choice of two pointers from a list of five.

The majority of the multiple choice questions are on problem solving, expertise, and reasoning. Although the multiple choice questions cover only the chapters and lectures since the midterm, the essay question enables you to bring in material, when relevant, from the entire course.

Topics, themes, and pointers preceded by an asterisk (*) should be given special attention. You will be given a choice of two pointers from a list of five. The list of pointers includes four that we encountered in the second half of the course and one from the first half. The essay will be worth 40 points and I will plan to assign them roughly as follows:

1. For a correct description of each of your chosen pointers: 5 points each, or up to 10 points for correctly describing both.
2. For pointing to and adequately explaining themes that are both relevant to the pointer and that are important for cognition: 10 points each, or up to 20 points for relevant and well explained themes.
3. For a summary integration of your themes from both pointers--an integration that explains what they tell us about the nature of human cognition: 10 points.

<u>REMEMBER THAT THE FINAL EXAMINATION WILL BE IN 133 GILBERT HALL, ON WEDNESDAY, DECEMBER 11, 1991 AT 8:00 A.M.</u>

TOPICS

        ATTENTION
        COGNITIVE DEVELOPMENT
        *COMPREHENSION
        *EXPERTISE
        IMAGERY
        INTELLIGENCE
        IQ
        LANGUAGE
        LANGUAGE AND THOUGHT
        *LOGIC AND REASONING
        MEMORY

NATURE/NURTURE
PERCEPTION
*PROBLEM SOLVING
RATIONALITY
REPRESENTATION
TEXT PROCESSING
THE STANDARD MODEL
THEORY OF SIGNAL DETECTION
WORKING MEMORY

THEMES

ACTIVATION/STRENGTH
ALGORITHM/HEURISTIC
ANCHORING
ASSIMILATION/CONTRAST
*ATTENTION/ALLOCATION OF RESOURCES
*AUTOMATIC/CONTROLLED PROCESSES
AVAILABILITY
*BOTTOM-UP AND TOP DOWN PROCESSING
BREADTH-FIRST/DEPTH-FIRST STRATEGY
BRIDGING INFERENCE
CHUNKING
COMPETENCE/PERFORMANCE
CONFIRMATION BIAS
CONSERVATION
CONTENT EFFECTS
CONTEXT
*CONTRIBUTIONS (OBSERVER, ENVIRONMENT)
COOPERATIVE PRINCIPLE
CRITERION/SENSITIVITY
CRITICAL PERIOD
DEONTIC REASONING
*DOMAIN-GENERAL/DOMAIN-SPECIFIC
DUAL CODE THEORY
FIGURE/GROUND
FUNCTIONAL FIXEDNESS
HINDSIGHT
IMMEDIACY OF INTERPRETATION
IMPLICIT MEMORY
INCUBATION
*INFERENCE
INFORMATION COMPRESSION
INSIGHT
INTERFERENCE/DECAY
*LIMITS/DATA
*LIMITS/RESOURCE
MASSED VS SPACED PRACTICE
MATCHING EFFECT
*MEANING
MEANS-ENDS ANALYSIS
*MENTAL MODELS

*METACOGNITION
MORE/LESS
NETWORKS
*OVERCOMING LIMITS
PAREIDOLIA
PARSING
PERCEPTION/IMAGINATION
PROBLEM SPACE
PROCEDURAL KNOWLEDGE
PRODUCTION SYSTEM
PROPOSITIONS
PROPOSITIONAL REPRESENTATIONS
RECOGNITION/RECALL
REHEARSAL/ELABORATION
REHEARSAL/MAINTENANCE
*REPRESENTATION
REPRESSION
REPRODUCTIVE/RECONSTRUCTIVE
*SCHEMAS
SCRIPTS
SET
SIGNAL/NOISE
SIMILARITY
SPATIAL/LINEAR
*SYNTAX/SEMANTICS/PRAGMATICS
TYPE I ERROR/TYPE II ERROR
UNCONSCIOUS INFERENCE
UNIQUENESS

POINTERS

7C-7S
BLONDLOT AND N-RAYS
BOOMERANGS
CHESS
*CHRISTIAN DION
CONDEMNED PRISONERS
DOMINO
EBBINGHAUS
ELIZA
EYE-CHART DEMONSTRATION
FILTERED SPEECH
FORER
Fs
GARFINKEL
*GPS
HECHT-SHLAER-PIRENNE
HOBBIT AND ORCS
IMAGE SCANNING
INVISIBLE RECTANGLE

KOHLER
MENTAL PAPER FOLDING
MENTAL ROTATION
MNEMONIC SYSTEM
*MONTY HALL PROBLEM
*MOUNTAIN CLIMBER PROBLEM
MUTILATED CHECKERBOARD
MYCIN
PARTIAL-REPORT PROCEDURE
*PIAGET
PHONEME-RESTORATION EFFECT
*PSYCHIC READING
RAUDIVE VOICES
RODS/CONES
SPEECH ERRORS
SULTAN
THE CAT
TWO-STRING PROBLEM
WASON 2-4-6 TASK
*WASON SELECTION TASK
WHORF
WORD SUPERIORITY EFFECT

FINAL EXAMINATION

This examination consists of two parts. Part I contains 60 multiple choice questions. Record your answers on the special answer sheets with a number 2 pencil. Make sure to place your name and your ID number on the answer sheet. Mark only one answer for each multiple choice question. Part II provides you with a choice of two pointers from a list of five. You will use your chosen pointers to write an essay about cognitive psychology and its important themes.

PART I: MULTIPLE CHOICE (60 POINTS)

For each of the following 60 items, choose one of the four alternatives. Although you may feel that more than one alternative might fit, choose the one best one for that item.

1. Sultan could not reach the banana outside his cage with either of his two sticks. After sulking for a while, Sultan suddenly put one end of a stick into the hollowed end of the other. This gave him a stick long enough to reach the banana. Kohler said that Sultan solved the problem by
    A. Insight   C. Working backward
    B. An algorithm   D. Trial and error

2. The problem space consists of
    A. The initial and the goal states
    B. The path from the initial to the goal state
    C. All the possible states that can be reached from the initial state
    D. Those states that the problem-solver actually considers

3. If you go first in a game of tic tac toe and follow a certain strategy you will always win or gain a tie. The strategy in this case is
    A. An algorithm   C. An analogy
    B. A heuristic   D. Functionally fixed

4. Difference reduction differs from means-ends analysis by
    A. Not having procedures to create subgoals for applying operators
    B. Relying on the similarity principle
    C. Being goal oriented
    D. Being able to learn

5. The general problem solver (GPS) solves problems by
    A. Insight   C. Analogy
    B. Difference-reduction   D. Means-ends analysis

6. The mutilated checkerboard problem illustrates the importance of
    A. Analogy   C. The correct representation
    B. Working backwards   D. Prior knowledge

7. Subjects frequently fail to solve the two string problem by using pliers because
    A. The pliers were not long enough
    B. Of mental set
    C. Of functional fixedness
    D. The search space is too big

8. The available evidence suggests that incubation effects are due to
   A. Sticking with the problem until a solution is reached
   B. Confirmation bias
   C. The dissipation of inappropriate knowledge structures
   D. Unconscious thinking

9. Problem solving often involves search. What is usually being searched for?
   A. A correct problem representation that contains a goal
   B. New heuristics for reaching the goal
   C. A sequence of operators that leads to the goal
   D. Goal-relevant ways of measuring similarity between two states

10. According to Anderson, genius levels of performance
    A. Result from heredity
    B. Are domain-independent
    C. Require at least 10 years of practice
    D. Decline rapidly after 20 years of age

11. The first stage in the development of a skill
    A. Is the sensory-motor stage   C. Is the cognitive stage
    B. Is domain-dependent   D. Depends on procedural knowledge

12. Declarative and procedural knowledge during the acquisition of a skill tend to coexist
    A. Only in verbal tasks   C. During the associative stage
    B. During the cognitive stage   D. During the autonomous stage

13. With continued practice, the mastery of a skill
    A. Improves rapidly at first and then levels off
    B. Improves rapidly at first and continues to improve but less and less rapidly
    C. Improves at the same rate throughout the period of practice
    D. Improves very slowly until the critical period

14. For skill learning, acquisition is most efficient
    A. With mental practice
    B. When the learner rehearses declaratively
    C. With massed practice
    D. With spaced practice

15. If the separate components of a skill are independent, the most efficient way to acquire the total skill is to
    A. First integrate the components
    B. Practice the whole skill as a unit
    C. Used massed practice
    D. Practice the components separately

16. Experts differ from novices by using forward reasoning
    A. In all types of problems
    B. In computer programming but not physics
    C. In physics but not computer programming
    D. Only for unfamiliar types of problems

17. Novices differ from expert computer programmers
    A.   By working backwards
    B.   By using breadth-first strategy
    C.   By using depth-first strategy
    D.   By working forwards

18. Experts differ from novices in computer programing in using representations that
    A.   Are language independent
    B.   Adhere closely to the problem description
    C.   Are language dependent
    D.   Are jargon free

19. Master chess players, in comparison to novice chess players,
    A.   Consider more possibilities before selecting a move
    B.   Can remember the positions of many more pieces when shown the situation from a typical game
    C.   Have much greater working memory capacity
    D.   Search a much larger problem space

20. The number of different chess patterns or chunks that master chess players have acquired, according to the best estimates, is
    A.   1,000   C. 50,000
    B.   5,000   D. 1 million

21. What does happen as a function of proceduralization?
    A.   Subjects select better strategies for problem solving
    B.   Subjects rely less on verbal rehearsal
    C.   Subjects acquire better representations
    D.   Subjects develop larger working memories for information in the domain of interest

22. Which of the following is a difference between expert and novice problem solvers in a specific domain?
    A.   Experts search the problem space more deeply
    B.   Experts more logically work backward from their goal to the givens of a problem
    C.   Experts have learned the correlations between problem features and problem solutions
    D.   Experts have a better set of general problem-solving skills

23. Which is the best way to summarize the basis of development of expertise in a domain?
    A.   People switch from using heuristics to using algorithms
    B.   People do many things by recognition that they once did by search
    C.   People switch from breadth-first to depth-first search
    D.   People switch from forward search to backward search

24. Inductive reasoning
    A.   Involves reaching conclusions that are probable but not certain
    B.   Involves reaching conclusions with certainty
    C.   Enables one to reach valid deductions
    D.   Is domain-dependent

25. Consider the following argument:
If a student earns more than 220 points he will get a grade of A.
Ernest's grade was B.
Therefore he did not earn more than 220 points.

This argument
A. Is invalid
B. Is an example of modus ponens
C. Is an example of denying the antecedent
D. Is an example of modus tollens

26. In the Wason selection task the subject must decide which cards to turn over to judge if rule applies to the following four cards: E, K, 4, 7. Most subjects turn over the E and the 4. By turning over the 4, the subjects are demonstrating
A. The fallacy of denying the antecedent
B. The fallacy of affirming the consequent
C. Modus ponens
D. Modus tollens

27. Students who have taken a course in logic, compared to students who have not,
A. Perform markedly better on the Wason selection task
B. Perform markedly worse on the Wason selection task
C. Perform about the same on the Wason task
D. Choose all four cards more frequently

28. Subjects tend to estimate that there are more words that begin with the letter K than there are with K in the third position. This is an example of
A. Correct induction
B. Availability
C. Similarity
D. The word superiority effect

29. The Gambler's fallacy is one consequence of
A. The availability bias
B. The anchoring bias
C. The similarity bias
D. The matching bias

30. The problem of the monk climbing the mountain shows the importance of
A. Functional fixedness
B. Similarity
C. Recursion
D. The initial representation

31. In the Monty Hall game show problem, the contestant chooses one of the three doors. Assume that the host does not know behind which door the prize is. The host randomly opens one of the two unchosen doors and shows there is no prize behind it. He offers the contestant the opportunity to change her choice. If the contestant changes her choice she
A. Lowers her chances of winning
B. Increases her chances of winning
C. Is certain to lose
D. Has a 50-50 chance of winning

32. The psychologist who developed the idea of mental models just before the cognitive revolution was
A. Kenneth Craik
B. Thorndike
C. Kohler
D. Chomsky

33. The general problem solver (GPS) solved problems using
   A. Domain-dependent rules
   B. Algorithms
   C. Domain-independent rules
   D. Past experience

34. In the condemned prisoner problem, one of the three prisoners will be hanged. The jailer tells prisoner A that prisoner C will be one of the two who will be hanged. Prisoner A feels somewhat better because the probability that he will be saved has been increased from 1/3 to 1/2. Prisoner A
   A. Is wrong because his probability of being saved is still 1/3
   B. Is correct .
   C. Would be correct if the jailer is trustworthy
   D. Has committed the base rate fallacy

35. Problem solving occurs when we have a goal
   A. That is well defined
   B. That is knowledge-rich
   C. That cannot be achieved with automatic processing
   D. That is ill-defined

36. If subjects in the Wason selection task misinterpret the conditional rule as a biconditional (illicit conversion) then they should turn over
   A. Only the vowel (P)
   B. The vowel and the even number (P & Q)
   C. All 4 cards
   D. The vowel and the odd number (P & not Q)

37. In the abstract form of Wason's selection task the majority of the subjects choose P (vowel) and Q (even number). This is consistent with
   A. A confirmation bias
   B. A matching bias
   C. Both the confirmation bias and the matching bias
   D. A performance lapse

38. Deontic reasoning deals with
   A. Logical consequences of arguments
   B. Permission, obligation, and other ethical rules
   C. Categorical statements
   D. Hypothesis evaluation

39. When the Wason selection task is presented with meaningful content more subjects choose the correct cards. Some investigators argued that humans possess a mental logic which is revealed only when a problem deals with meaningful content. The weakness of such an argument is
   A. Logic, by definition, is independent of content
   B. Not all content is meaningful
   C. It denies the antecedent
   D. It is inductive

40. In the demonstration of N-rays for Wood, Blondlot placed his hand between the assumed N-ray source and the spark gap. Blondlot was looking for
   A. The intensity of the spark gap to diminish
   B. The intensity of the spark gap to increase
   C. His hand to become transparent
   D. His criterion to go down

41. One serious weakness of GPS is
   A. Its poor memory
   B. Its inability to create subgoals
   C. Its use of breadth-first search
   D. Its inability to change the initial representation

42. When the standard Wason selection task was reworded to test the rule "If a card has a vowel on one side it does not have an odd number on the other", the subject's selections
   A. Were the same as with the original wording
   B. Supported they hypothesis of confirmation bias
   C. Supported the hypothesis of matching bias
   D. Showed a content effect

43. Cosmides argues that when subjects select the correct cards in the meaningful form of the Wason selection task they are
   A. Using memory cueing
   B. Using the availability heuristic
   C. Looking for cheaters
   D. Using mental logic

44. What do speech errors like "toin coss" illustrate?
   A. That we plan speech a constituent at a time
   B. That spreading activation is involved in speech generation
   C. That certain phrases become encapsulated and are processed as wholes
   D. That speaking is more consuming of working memory than writing

45. Which of the following is the best argument for the view that language is a special faculty apart form the rest of cognition?
   A. Natural languages exhibit language universals
   B. It is particularly difficult to recover from language loss due to brain damage after puberty, while recovery of other skills does not show this age specificity
   C. Only humans possess language
   D. Eskimo languages have more words for snow than standard English

46. What evidence did Just and Carpenter provide for immediacy of interpretation?
   A. Subjects spent more time at the end of a sentence
   B. Subjects do not look at all the words in a sentence
   C. Subjects' eye movements will regress to earlier words in a sentence
   D. Subjects spend a long time looking at important words

47. According to Kintsch and Keenan, what determined how long their subjects took to comprehend a sentence?
   A. The number of propositions
   B. The number of constituents
   C. The number of words
   D. The number of syllables

48. Children first display correct conservation in which period?
   A. Formal operational
   B. Concrete operational
   C. Preoperational
   D. Sensorimotor

49. Which Piagetian task is used to illustrate the difference between the concrete operational stage and the formal operational stage?
   A. Research on hidden objects
   B. Conservation
   C. Seriation
   D. Balance scale task

50. In the study by Schneider, Korkel, and Weinart on memory for soccer stories, which factor had the greatest impact on memory performance?
   A. Ability on an intelligence test
   B. Piagetian stage
   C. Soccer expertise
   D. Grade level

51. Intelligence:
   A. Is defined by intelligence tests
   B. Cannot be obtained by commputers
   C. Is relative to culture
   D. Reflects a single underlying factor

52. Solving analogy problems is most related to:
   A. Mathematical ability
   B. Spatial ability
   C. Verbal ability
   D. Reasoning ability

53. In the Wason 2-4-6 task, in which the subjects try to find the rule for generating the numbers, the subjects
   A. Discover the rule by deduction
   B. Show a confirmation bias
   C. Show a matching bias
   D. Tend to propose rules that are more complicated than the actual rule

54. Christian Dion and his challenger agreed to the following test: Christian would give readings to 100 members of his radio audience. After six months all the predictions would be checked. If more than 75% were correct, Dion would be declared the winner. This test
   A. Is fair because it is objective
   B. Is unfair because six months is too short a period
   C. Is inadequate because it allows Christian to fail almost 25% of the time
   D. Is inadequate because it lacks a proper control comparison

55. "Setting the stage" contributes to the success of the psychic reading
   A. Because it enhances the psychic's accuracy
   B. By putting the client on the same wave length as the psychic
   C. By arousing the client's emotional state
   D. By inducing the client to seek meaning in the psychic's statements

56. Freud's patient was still impressed with the psychic reading she had received many years earlier because
    A. The psychic had correctly predicted she would have twins
    B. The psychic had told her what she wanted to come true
    C. She had fallen in love with the psychic
    D. The psychic had flattered her

57. McGrew and McFall conducted their test of astrology with the full cooperation of the Indiana Federation of Astrologers. When the test showed no validity for astrology, the astrologers
    A. Openly admitted that they were mistaken in believing in astrology
    B. Decided to revise the rules for interpreting astrological signs
    C. Admitted the failure but attributed it to the use of young subjects
    D. Accused the experimenters of foul play

58. Seeing a human face on Mars is an example of
    A. Similarity
    B. The Barnum effect
    C. Pareidolia
    D. Representativeness

59. When a client visits a psychic reader, the client knows that the reading is supposed to be about her(him). The compelling feeling that the reading is accurate can be due to
    A. The base rate fallacy
    B. The similarity heuristic
    C. Hindsight
    D. The fan effect

60. Forer developed and tested his general personality sketch to study
    A. Whorf's hypothesis
    B. The matching bias
    C. The fallacy of personal validation
    D. The confirmation bias

PART II: ESSAY (40 POINTS)

Choose two of the following pointers. Briefly explain what each pointer is and what important themes it illustrates. Then explain how these themes combine to explain how human cognition works. Try to choose your two pointers so as to bring out as many different and important themes as possible. You will receive up to 5 points for a correct description of each pointer (a total of 10 possible points); up to 10 points for identifying and explaining relevant and important themes for each of your two pointers (a total of 20 possible points); and up to 10 points for supplying a brief integrative summary of your themes and what they tell us about cognition.

GPS
Blondlot & N-Rays
Wason Selection Task
The Psychic Reading
The Monty Hall Paradox