SYLLABUS *cognition*

Psy 435/535 Cognition

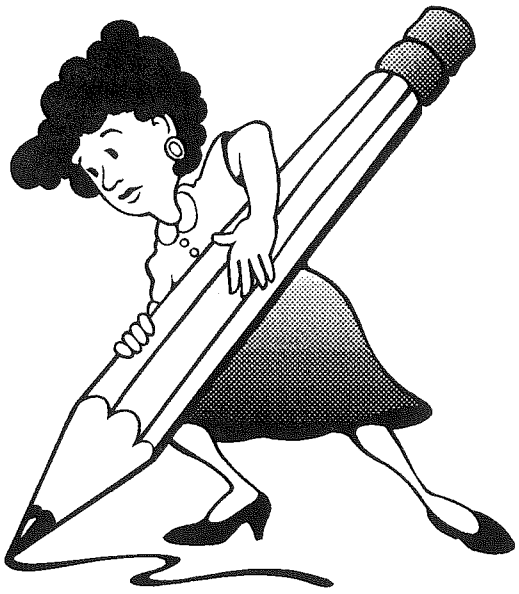
Spring 1994

1. General Information

1.1 Catalog Details:	Psy 435 CRN 35162/ Psy 535 CRN 35163 UH 8:00-9:20 a.m. 146 Straub Hall
1.2. Instructor:	Ray Hyman 323 Straub Hall, 346-4910 Office Hours: M 2:00-3:30 p.m./ F 10:00-12:00 p.m.
1.4. Textbook:	Medin, D.L., & Ross, B.H. (1992). *Cognitive Psychology*. NY: Harcourt Brace Jovanovich
1.5. Examinations:	**MIDTERM: April 28, 1994** **FINAL: June 7, 1994 @ 8:00 a.m.**
1.6. Term Paper:	The term paper is due on ***Tuesday, May 31, 1994***. Papers handed in after this deadline will either be marked down or not accepted.

Topics & Assignments

DATES	TOPICS	ASSIGNMENTS
	OVERVIEW	
March 29, 31	Basic Themes, Overview, History	Preface, Ch1, Ch 2
	ACQUIRING INFORMATION	
April 5, 7	Signal Detection, Learning	Ch 3, Ch 4
April 12, 14	Mnemonics, Attention, Perception	Ch 5, Ch 6
	MEMORY	
April 19, 21	Ebbinghaus, Bartlett, Imagery	Ch 7, Ch8
April 26	Review	
April 28	***MIDTERM***	Bring #2 pencils!
May 3, 5	Language, The Psychic Reading	Ch 9, Ch 10
May 10, 12	Comprehension, Inference, Concepts	Ch 11, Ch 12
	THINKING	
May 17, May 19	Judgment, Decision Making, Reasoning	Ch 13, Ch14
May 24, May 26	Problem Solving, Expertise, Creativity	Ch 15, Ch 16
May 30, June 1	Review	Ch 17 Term paper due May 30
June 7, Tues @ 8:00 am	***FINAL EXAMINATION. Please bring #2 pencils and show up on time.***	



YOU AND YOUR GRADE

1. Points and Letter Grades

You can earn a total of 250 points in this course. The Midterm is worth up to 50 points; the Final Examination is worth up to 100 points; and the term paper is worth up to 100 points.

I do not grade on a curve. Instead, I try to set standards which a student has to meet to get a letter grade. As a rough guideline, you would need to get 212 or more points to earn an A; 188 to 211 points to earn a B; 162 to 187 points to earn a C; and 138 to 161 points to earn a D. These are approximate guidelines because I make adjustments based on the difficulty of the examinations and other unanticipated factors.

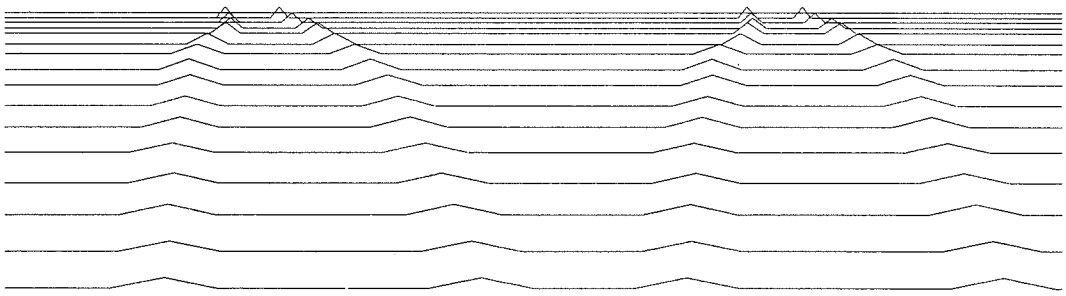
2. The Term Paper

You have to submit a term paper to pass the course. The term paper provides you another opportunity to show what you have learned in *this course*. For your term paper, choose 10 pointers from the course. Use these pointers to write an integrative essay on cognitive psychology emphasizing the unifying themes and materials used in this course. The integration refers not only to tying the themes together but also to putting the lectures and the textbook together into a unified story. Your paper will be graded on comprehensiveness, integration, importance of the themes, and evidence that you have understood and can sensibly discuss the key issues of this course. *Warning! Each year, students turn in otherwise excellent papers that show no explicit connection with the key themes and issues of this course. Make sure that you explicitly use topics, pointers and themes from the textbook and lectures in this course or you will receive no credit for your paper.*

How long should your paper be? Over the past three years, the typical paper has averaged 8 to 9 pages in length. The range has been from four to 20 pages. Generally, papers shorter than 5 pages have received rather low grades. Some excellent papers have been as short as 7 pages, but most of the better grades have gone to papers approximately 10 pages in length.

3. The Examinations

The examinations will be half multiple-choice and half essay in format. The coverage is equally on the text and the lectures.



Topics, Pointers, & Themes: A Study Guide

If you have looked at your textbook or if you have skimmed the subjects listed on page 2 of this syllabus, some questions might occur to you. The topics--attention, perception, memory, language, decision making, and problem solving, etc.--were covered in your introductory psychology course. Moreover, the Psychology Department offers separate courses in perception, learning, memory, psycholinguistics, decision making, and thinking. So what's the point of covering these topics in a separate course called `cognition'?

In fact, many cognition textbooks are little more than glorified introductory psychology books. They begin with the obligatory chapter on the history of psychology and its methods. Then they cover attention, perception, memory, language, reasoning, and thinking at a level and detail that differs little from the coverage of the same topics in the typical introductory psychology text.

In my opinion, the justification for covering these topics again in a course on cognition is to show how they can be integrated by a few central and important themes. We do not want to simply review what we have already learned about perception, memory, and thinking. Rather, we want to understand these topics in a new way. We want to focus on those themes that explain both the achievements and failures of human intelligence. What is it about the way we acquire, store, understand, and use information that makes us the cognitive marvels (according to some) or the abject blunderers (according to others) that we are?

Your textbook focuses on ambiguity and how we cope with it as the integrating motif. Medin and Ross define cognitive psychology as "the study of the human mind; its domain includes questions concerning how people perceive the world, remember information, use knowledge, understand language, learn, reason, and solve problems. ***In each area one can show that an intelligent organism that objectively considers all possibilities is doomed to failure. It will not be able to learn a language, solve complex problems or understand events in the world as meaningful...any visual perception is consistent with an unlimited number of interpretations. The challenging question is how the perceptual system functions such that we are normally unaware of any ambiguity...***" [Emphasis added].

Pay careful attention to the italicized portion of the preceding quotation. Do you fully understand what the authors are saying? Why should the consideration of all the possibilities doom us to failure? Your task in this course is to grasp fully the meaning of this quotation.

Medin and Ross go on to say that "we have organized this entire book around challenges posed by ambiguity. ***The world continually confronts us with situations that offer too little information about what is going on and too many possibilities about what to do. Rather than try to consider all the possibilities, we come prepared with certain biases or expectations that greatly influence what we consider and how we act. We may not experience ambiguity because we do not consider alternative possibilities. These `constraints' occur in all facets of cognition and, we believe, are responsible for the successful performance of the cognitive system Finally, one should note that constraints represent an adaptation to our world and therefore, should be thought of more as `guiding principles' rather than limitations.***" [Emphasis added]

This last quotation captures the heart of Medin and Ross's story. You will find it useful to spend some time before you get into the course thinking about this statement. As an interesting and helpful exercise, write down your thoughts (in a page or so) about this statement. Date your thoughts and put them aside. When studying for the midterm, make another attempt to write down your understanding of this statement. Finally, do it again when studying for the final examination. Hopefully, when you compare your three responses, you will see some big gains in your grasp of these principles. [This exercise is for your personal benefit. It is not an assignment. However, I would be interested in reading your three responses if you are willing to share them with me.] Why should our biases help us in dealing with an ambiguous world? Can you explain how biases and constraints on what we experience can be considered as useful adaptations? Medin and Ross do not explicitly discuss consciousness. Yet, one implication of their motif is that we experience *consciously* only one of the many possible interpretations in a given situation. Does this suggest a role for consciousness in cognition?

Your task in this course is demonstrate that you can integrate the material in the lectures and the textbook around the central theme in the preceding quotations as well as a few additional major themes. As we proceed through the course you will encounter a number of what I will call *topics, pointers, and themes*. *Topics* are broad subdivisions of the content we will be dealing with. Your text, for example, divides cognitive psychology into the topics of *Acquiring Information, Memory, Language and Understanding,* and *Thinking*. These broad topics are, in turn, broken down into somewhat narrower topics. The broad topic of *Acquiring Information* includes the subtopics of *Learning, Attention,* and *Visual Attention.*

Pointers are demonstrations, experiments, or other concrete models that illustrate (point to) one or more important principles or themes. *Themes* are general principles or theoretical generalizations about how cognition operates or what problems cognition has to cope with. For your term paper, you will select a set of pointers and use the themes to which they point as the basis for an integrated statement of what cognitive psychology is.

The following table lists some of the topics, pointers and themes that we will encounter in each week of the course. This is just a sample. Think of the table as a starter kit. You can add additional terms to the list as the course progresses.

Some Key Terms

Dates	Topics	Pointers	Themes
May 29, 31	Cognitive Psychology Cognitive Science Information Consciousness	7C/7S/ Shape Constancy Illusion/ Blindsight Invisible Rectangle Domino/ Fs Filtered Speech Policeman	**Ambiguity**, AI, **Computational complexity**, Connectionism, **Constraints**, **Contributions (O,E)**, Folk Psychology, **GPS**, Information Processing, Introspection, Less/More, **Limits**, **Metacognition**, Perception/Imagination, **Top Down/Bottom Up**/ Satisficing
April 5, 7	Acquiring Information, Learning, Attention	Dichotic Listening Partial Report Mental Paper Folding The Standard Model THE CAT	Availability, Anchoring, **Automaticity**, Chunks, Conditioning, Illusory Correlation, Instrumental learning, Mental models, **Parallel/ Serial**, Superstitious behavior, Unusualness Heuristic, What/where
April 12, 14	Perception Imagery Representation	Mental Rotation Mnemonics Boomerangs Hecht, Shlaer, Pirenne	**Allocation of resources**, Assimilation/Contrast, Features/Templates, Figure/ground, **Data limits**, **Resource limits**, Dual coding, Signal detection
April 19, 21	Memory, Representation	ACT Amnesia War of the Ghosts	Chunking, Declarative memory, Encoding Specificity, Episodic memory, Explicit Memory, Implicit memory, Incidental learning, Intentional learning, LTM, Levels of processing, PDP, Procedural memory, Propositions, Semantic memory, Serial position effect, Spreading activation, STM, Typicality effect
May 3, 5	Language Language Acquistion	The Psychic Reading Christian Dion Forer Connectionism	Categorical perception, Garden path, McGurk Effect, Modularity, Morpheme, Motor Theory, Personal Validation, Surface/Deep structure Less-is-more, Linguisitic universals, productivity, whole-object assumption
May 10, 12	Comprehension Inference Concepts	Eliza Garfinkel Phrenology	Ad hoc categories, Basic level, Category, Concept, Conversational maxims, Default assumptions, Frame, Given-new, Intuitive theories, Invited inference, Mental models, Presupposition & assertion, Prototype, Psychological Essentialism, Similarity, Slots, Schema, Typicality

Dates	Topics	Pointers	Themes
May 17, 19	Thinking Decision Making Reasoning	Wason Selection Task Von Restorff	Anchoring & adjustment, Availability, Base rate, Bayes' Theorem, Bounded rationality, certainty effect, Cognitive heuristics, Confirmation bias, Conjunction fallacy, Framing effects, Gambler's Fallacy, Hindsight Bias, Overconfidence, Representativeness, Satisficing, Utility
May 24, 26	Expertise CreativityProblem Solving	GPS, Monty Hall, Mountain Climber Problem, Candle Problem, X-Ray Problem, Thorndike, Köhler Chess Silveira Expert/Novice Water Jugsm,	Algorithm, Case-based reasoning, Functional fixedness, Heuristic, Ill-defined, Means-end, Operators, Problem Space, Protocols,Einstellung, Expert System, Incubation, Productions, Pragmatic Schemas, Deontic Logic
May 31. June 2	Review		Rationality, Consciousness, Levels (brain, behavior, phenomenology, social)
June 7, 1994 @8:00 am	*Final Examination*	The final examination will focus mainly on the topics and pointers that were covered after the midterm examination. The themes that were covered before the midterm are also relevant to the topics and issues that occurred after the midterm.