

SYLLABUS

Thinking

Psy 330 Winter 1994

1. Goal

Our goal is to improve your thinking skills. We do not aspire to teach you how to think. You already can think. Instead, we try to teach you how to use your thinking more effectively. We do this in two ways. 1) We *inform* you about what psychologists have learned about thinking and we *acquaint* you with techniques based on this knowledge. 2) We provide you with exercises in applying these techniques. The exercises consist of four short papers in which you apply the techniques to evaluate specific claims.

2. Class Meetings

The lectures are an essential part of the course. If you cannot attend regularly, please do not enroll. You will be wasting your and our time. The lectures are from 8:00 to 10:00 A.M. Tuesday and Thursday, in 150 Columbia.

3. Instructors

Instructor:

Ray Hyman
323 Straub, 346-4910
Office Hours: M 2:00-3:30 pm, F 10:00-12:00pm

TA:

Uta Volle
310 Straub, 346-2920
Office Hours: TBA

4.0 Text

Halpern, D.F. (1989, Second Edition). *Thought and Knowledge: an Introduction to Critical Thinking*. Hillsdale, NJ: Lawrence Erlbaum.

5.0 Requirements

Examinations: Both the Midterm [February 3, 1994] and the Final Examination [Monday, March 14, 1994 @ 8:00 a.m.] will consist of multiple choice items. Approximately half the items will be based on the text and the remainder on the lectures and exercises. The Midterm will contain 50 multiple choice items and the final will contain 100 items. Because of the class size, *no makeup examinations will be given*.

Exercises: The exercises consist of four short papers. The first three papers should be two to three pages in length. The last paper should be 3-5 pages long. Each paper will deal with an assigned example that you will evaluate according to the framework given at the end of this syllabus. You will also find Exercise #1 at the end of this syllabus.

Research Participation: The Psychology Department requires students in this course to serve as subjects in three hours of psychology experiments. However, if you complete your four exercises you do not have to meet this research requirement. Instead, those of you who do complete your research participation can use it to bring your lowest grade on the first three exercises up to the maximum 10 points.

IMPORTANT!

The exercises make up the heart of the course. Although they can contribute a maximum of 25% to the total number of points in this course, *you cannot pass the course unless you complete all four exercises on time*. Please keep this in mind when considering to remain in this course. The goal of the course is to provide you training in systematically thinking about issues and problems. You cannot benefit from the course without doing the exercises on time.

6. Grading

You can achieve a total of 200 points in the course. Your grade will be based on the total number of points you earn from the examinations and the exercises. In addition bonus points can be given for research participation and for marked improvement from midterm to final examination performance. To pass the course you need to *both* complete the four exercises on time and achieve a total of at least 100 points. You can earn your points in the following ways:

Exercises: You can earn up to 50 points for the set of four exercises. Each of the first three exercises is worth up to 10 points each. [If you complete the research participation, we will increase the lowest score you got on these exercises up to the maximum of 10 points.] The fourth exercise is worth up to 20 points. *Remember that you must complete the four exercises by their due dates to pass this course.*

Examinations: The midterm is worth up to 50 points [one point for each correct answer]. The final examination is worth up to 100 points. In special cases where your final examination score shows marked improvement over an unsatisfactory midterm score, we will ignore the midterm score and pro-rate your total score based on your final examination.

Course Calendar and Assignments

Dates	Topics	Assignment	Pointers & Themes
Jan 4, 6	The Framework/ Critical Thinking, Intelligence, Memory, Halpern's Framework	Begin Exercise 1 Ch 1, 2	Key Bending/ Uri Geller/ Watch + Band/ Bruner-Potter/ Shape Constancy Illusion/ PK Parties/ Penny/ Washing Clothes/ Peace March/ Mnemonics/ Conditional Reasoning/ As-reported: as-happened/ Garbage-in: Garbage-out/ Falsifiability/ Metacognition/ Transfer/ Advance Organizers
Jan 11, 13	The Framework/ Thought & Language, Comprehension	Ch 3	Psychic Reading/ PQ3R/ Surface structure/ Meaning/ Framing/ Inference/ Graphic Organizers/ Communication Rules/ THE CAT
Jan 18, 20	Reasoning, Logic, Rationality	<i>Exercise 1 due</i> Begin Exercise 2 Ch 4	Forefinger to Nose/ Deaf-dumb customer/ Mulholland/ Sherlock Holmes/ Doyle & Houdini/ Wason 4 Card Problem/ Deduction-induction/ Observation/ Belief Bias/ Content Effects/ Illicit Conversions/ Confirmation Bias/ Circle Diagrams
Jan 25, 27	Analyzing Arguments	Ch 5	Doyle & Houdini/ Retrospective Falsification/ Illusory Correlation/ Vividness/ Untying Scarves/ Faraday/ Psychics & Scientists/ Zöllner & Slade/ Not-Me/ Power of the Situation/ Polarization/ False Dichotomy/ Credibility/ Fallacies/Diagraming
Feb 1 Feb 3	Review MIDTERM EXAMINATION	<i>Exercise 2 due</i> <i>Bring sharpened #2 pencils!</i>	
Feb 8, 10	Hypothesis Testing/ Probability	Begin Exercise 3 Ch 6, 7	Pitldown Man/ Data & Resource Limits/ Expertise/ Misdirection/ Symbiosis/ Causal Models/ Incrementalism/ Independent & Dependent Variables/ Correlation and Cause/ Placebo/ Illusory Correlation/ Reliability/ Validity/ Self-fulfilling Prophecies/ Double-Blind/ Gambling/ Linda/ Conjunction Error/ Gambler's Fallacy/ Base-rate Neglect/ Regression toward the Mean/ Psychic Fallacy

Dates	Topics	Assignment	Pointers & Themes
Feb 15, 17	Decision Making	Ch 8	Contributions (O,E)/ Constraints/ Paleontological Model/ Schema/ Availability/ Mental Paper Folding/ Representativeness/ Entrapment/ Psychological Reactance/ Liking/ Cognitive Dissonance/ Hindsight
Feb 22, 24	Problem Solving	<i>Exercise 3 due</i> Begin Exercise 4 Ch 9	Birthday Problem/ Subliminal Tapes/ Blindsight/ Representation/ Heuristics/ Effortless-Effortful Retrieval/ Parallelogram/ Monk/ Radius Problem/ Tumor Problem/ Tower of Hanoi/ Two- string Problem/ Nine-dot Problem/ Problem Space/ Insight/ Incubation/ Well-defined & Ill-defined problems/ Diagramming & Representation/ Functional Fixedness/ Mental Set
Mar 1, 3	Creativity/ Applications	Ch 10, 11	Clever Hans/ Lady/ Wife & Mother-in- Law/ Brainstorming/ Checklists/ Billiard Game/ Gambler's Fallacy/ IDEAL/ Ideomotor Action/ Dissociation/ Creative Reinterpretation/ Redefining/ Analogies & Metaphors/ Domain- Specific/ Structure Training/ Representational Training
Mar 8, 10	Creative & Critical Thinking/ Review	<i>Exercise 4 due</i>	Redefining the Problem/ Beyond the Framework/ Information Pollution/ Alternatives
Mar 14	FINAL EXAMINATION	8:00 TO 10:00 A.M	BRING NO. 2 PENCILS!



EXERCISE #1

Each of the four exercises will present you with a case or claim to evaluate. This first exercise is due *January 18, 1994*. For your report, please answer each question listed after the exercise. These questions will provide the general framework for coping with all the claims encountered in this course. Try to keep each answer short and to the point. Your report should be no more than four pages. The reports do not have to be typed, but they should be legible. We will give no credit for illegible reports. We will downgrade late reports, or assign them zero. In answering the questions, use what you have learned from the text and the lectures when possible. For example, you should find the information in Chapter 2 useful in doing this exercise.

The following is excerpted from Christopher Bird (1977), "Applications of Dowsing: An Ancient Biopsychological Art," in J. White & S. Krippner (Editors), *Future Science: Life Energies and the Physics of Paranormal Phenomena* (pp. 346-365). Garden City, NY: Anchor Books:

"The late John Shelley, Jr., former president of the American Society of Dowsters, during a summer tour of duty as a reserve naval aviator at the Pensacola Naval Air Station in Florida, began to get on the nerves of his fellow officers with his constant proselytizing about the dowsing art at which he was a master. They decided to put John into what they thought would be 'his place.'

"On the last day of the tour, the reserve pilots lined up at the paymaster's window to collect their checks. When John stepped up to the window, he was puzzled by the guffaws and snickers of his fellow fliers who began to crowd around him in obvious anticipation of what John felt was going to be a joke at his expense.

"The paymaster, a smirk on his face, leaned back in his chair. 'John, you've been talking so much about locating things with that silly rod of yours,' he intoned sarcastically. 'Well, now's your chance. Your paycheck is hidden somewhere in this building and, if you want to cash it, you'll just have to find it.'

"The building in question had three floors each with a long corridor and rooms branching off from them on both sides. Unhesitatingly Shelley whipped out a small plastic Y-rod which he perennially carried in the breast pocket of his tunic and began silently to ask himself a series of specific questions.

"The rod dipped. Trailing by his still snickering companions he went up to the second floor. He walked along the corridor until, just as he was passing the door to one of the rooms, the rod dipped again. Shelley strode to the middle of the room, his witnesses surging through the door behind him. Rod in his hands, it rotated in an arc until it dipped a third time. It was pointing straight toward a black briefcase on the edge of a table.

"The snickering suddenly stopped as John began to open the briefcase. He looked inside but it contained nothing. The silence was broken with loud laughing. Undaunted, Shelley held the rod over the briefcase. It dipped downward with a violent jerk. Perplexed, Shelley studied the problem for a moment, then noticed a thin gray-black rubber mat underneath the briefcase itself. After removing the case he gingerly took one corner of the mat between thumb and forefinger and raised the mat upwards. There was a U.S. Government check made out to John Shelley, Jr., lying beneath it."

COMMENTS ON THE EXERCISES

The four exercises used in this course deal with actual claims and are taken from published sources. However, they are relatively simple compared to the complexity and emotional impact of such contemporary issues as gays in the military, abortion rights, the Middle East crisis, how to deal with North Korea's refusal to allow nuclear inspections, and the health care issue. We have deliberately kept the exercises relatively simple because we want you to focus on the framework. Once the framework is mastered and becomes habitual, we assume that you will be able to apply it to these more complex and vexatious societal problems.

INSTRUCTIONS

Evaluate this report by answering each of the following questions. Repeat the questions in your report so that we know which answers go with each question. Keep in mind that no general set of questions applies exactly to every situation. Some modifications may be necessary depending upon the context. Also, remember that your goals may differ from those of the narrator. *Use these eight questions as the framework for doing the four exercises. Remember to number and repeat each question in your reports.*

1. What is the issue or question?

"The issue is a question which specifies the controversy and makes clear why the argument even takes place."¹ For our purposes, no actual controversy is necessary. An issue exists whenever we want to critically evaluate a claim, happening, performance, system or anything else. The issue should always be stated as question whose answer we are interested in. Many issues can be raised about claims or happenings we encounter. Try to identify one that seems to matter or is most dominant.

2. What is the claim [what is the proponent arguing for]?

The first step in thinking about an issue is to identify the claim or problem. Sometimes the claim is explicit. Other times the claim is implicit and you will have to supply it in your analysis. Often both explicit and implied claims are involved. You will also have to decide whether you are dealing with a specific claim about one concrete instance or a general claim involving an entire system. The claim is essentially an answer to the question raised by the issue.

2. What reasons are offered to support the claim?

Is evidence cited to support the claim? What sort of support is offered? Hearsay, testimonials, anecdotes, experimental results, analogies, etc.

3. How strong is the support?

Here you try to evaluate the support. Is it relevant? Is it trustworthy?

4. What would be adequate support?

What kinds of arguments and evidence would adequately support the claim? How could you find or get such support?

6. What reasons might create (false) beliefs in the claim by the proponent and followers?

For a psychologist, this is the most important question. It focuses on how people can believe what isn't so. As you read the text and listen to the lectures, try to generate a master checklist of the various biases, fallacies, and other factors that can trick us into believing false claims.

7. What did you notice or learn while doing this exercise that can be useful in dealing with the sort of problems that you face in your daily life?

This question is included to enhance the possibilities of transferring what you learn in this course to issues and

¹ Moore, K.D. (1986). Inductive arguments: a field guide. Dubuque, IA: Kenall Hunt.

problems you encounter outside the classroom. The idea is that if you consciously attend to ways of using this framework and the results of your exercises in other domains what you learn in this course will be much more useful to you.

8. What thoughts or actions on your part, while doing this exercise, were most helpful? What was not so helpful?

This question deals with *metacognition*. It is designed to get you to monitor your thought processes as you perform the exercises. If you make such self-monitoring of your thought processes habitual then you are more likely to find out what works and what does not work for you when you apply your thinking to new problems.

Comments on the Framework

No framework for thinking can be completely general without being vacuous. The preceding framework is oriented towards evaluating claims or arguments. We would want to modify the questions if we were applying it to finding the solutions to problems. Still other modifications would be desirable if we were using it to create new products or to generate novel ideas.

Many books and frameworks are available that promise to make you a better thinker. Most of them probably can be helpful if you systematically apply their suggestions. They help because they force you to tackle problems systematically. Studies show that good thinkers, as contrasted with poor thinkers, spend relatively more time trying to understand the problem and its requirements. Poor thinkers waste little time on trying to understand problem and jump right into possible solutions. Once a problem solver has formulated a possible solution it blinds him or her to other alternatives. The framework is designed, among other things, to make you 'look before you leap.'

Much thinking, no matter how systematic and logical, is wasted effort if the problem is wrongly understood or if the relevant 'facts' are erroneous or incomplete. This is the problem of 'garbage in/garbage out.' So the framework is designed to help you focus on the adequacy of the relevant evidence as well as to ensure that you are coping with the right problem.

A SAMPLE ANALYSIS

We present a case for analysis by the framework. The case is followed by a possible analysis using the framework. *Before you look at our analysis, try doing your analysis using the framework.* Thinking is a matter of doing. The more practice you have in applying the framework, the better you will do. We strongly urge you to do your own analysis before looking at ours. When you compare your analysis with ours, remember that many different analyses can be done. No one analysis is necessarily the best. You might find it worthwhile to discuss your analysis with Professor Hyman or Uta Volle.

The Sample Exercise

In 1944, the psychologist Crider published a study of a psychic or character reader². Margarita S. was 30 years old and had been a character analyst for 15 years. Her clients gave her excellent testimonials. To test her abilities, Crider conducted the following experiment. Margarita saw each of the 16 female college students from Crider's class in the author's office. Each student was seen individually. The analyst made a series of statements about each student. The statements were made one at a time and written down. The subjects had been instructed not to react to the statements. Margarita made from 19 to 25 separate statements about each student. After the 19 or more statements were written down they were handed to the student who checked those with which she agreed.

Crider reported that in seven of the analyses there was no disagreement at all. In only one of the analyses were there as many as three disagreements. All told, for the 16 analyses, Margarita made a total of 364 statements. Of these statements, the students disagreed with only 22. In other words the students agreed with 96% of the statements made by Margarita. Crider provided two sample analyses. We give one of these below:

1. Does not like to take chances.
2. Very-very sensitive.
3. Very self-conscious.
4. Gets along well with boys.
5. Above-average student.
6. Worries about her studies.
7. Introvert.
8. Over-emotional, tries to conceal it.
9. General health good.
10. Love life not in settled stage.
11. Has had broken love affair.
12. Should not be in business world.
13. Appreciates good music.
14. Must always have feeling of security or else is uneasy.
15. Is of generous and cooperative nature.
16. Digestive organs normal.
17. Heart normal.
18. Kidneys normal.
19. Finds it hard to ask favors.
20. Should not be given technical work.
21. Does not like routine either.
22. Very stubborn.
23. Bad temper when aroused, yet she doesn't display it often.
24. This girl would be happiest when being supported.

² Crider, B. (1944). A study of a character analyst. *Journal of Social Psychology*, 20, 315-318.

25. Has many big dreams.

Crider states that, "Psychologists may say that the statements are mostly complimentary, that they are too general, that they will apply to anyone. However, from what I knew of the students, I was in substantial agreement with the analyses as presented. More interesting is the fact that the students were satisfied, and in their discussion with each other following the analyses they were of the opinion that the analyses were surprisingly accurate."

Crider also supplies a statement from Margarita:

I believe we can and do absorb and register in our feeling worlds, the emotions and feelings of those we contact. Some people are more sensitive and can do this at will. I have been able to analyze personality, emotions, and temperament just by the impressions I receive while looking at an individual. I do not read the features or contours of the face. My findings are determined by thought vibrations which emanate from the individual. Those vibrations enter my emotional world and caused the same vibratory frequency to occur in my feelings. Thus, I feel what the individual feels.

Crider concludes: "Since she is one of several who are doing similar work I believe it is of considerable interest to psychologists to know how our competitors work; much better, in fact, to try to understand them than to scoff at them."

**Please try doing your own analysis
before reading the sample analysis
that follows.**



ILLUSTRATIVE ANALYSIS

1. What is the issue or question?

Can this character reader, or any fortune teller, accurately assess a client's personality just from mysterious vibrations or thought emanations? In other words, is there something beyond normal science taking place? [Note that the issue can be stated in many ways. You can focus on the abilities of this particular character reader. Or you can focus on the abilities of fortune tellers in general.]

2. What is the claim [what is the proponent arguing for]?

Crider is arguing that Margarita can, indeed, accurately assess character. He suggests that she can do so by means unrecognized by psychology or science. His hypothesis can be put in conditional form: IF PSYCHIC POWERS EXIST AND IF MARGARITA IS A PSYCHIC THEN MARGARITA SHOULD BE ABLE TO MAKE ACCURATE STATEMENTS ABOUT CLIENTS' PERSONALITIES.

2. What reasons are offered to support the claim?

Crider offers three reasons to support his claim. 1) 96% of Margarita's statements were judged accurate by the students; 2) the combined opinion of the students; 3) his own agreement with the assessments.

3. How strong is the support?

Several points could be made. Margarita sees each student as she makes her analysis. She can gain clues from dress, jewelry, posture, etc. For example, if the student had a major health problem this could be obvious just from observation. Although Crider instructed the students not to react to the statements, we do not know if the students gave unintentional bodily or other cues.

We could also question the use of the student's own self-evaluation as a suitable criterion. But the most serious limitation is the lack of a control baseline. What percentage of female college students in 1944 would accept these statements as true of themselves under the same circumstances?

[Later in the course we will learn many reasons why the use of the students' self-assessment is fallacious.]

4. What would be adequate support?

The answer to this question is implicit in the answer to question 3. One possibility is to use objective personality assessments as a criterion against which to correlate Margarita's statements. [This is trickier than it seems as will be discussed in class]. Ideally, we would want a control baseline against which to evaluate her apparent rate of success. For example, later studies had some students evaluate those statements actually made about them. Other students evaluated statements made for someone else but which they believed were made for them. Under these circumstances both groups accept the same proportion of statements as accurate self-descriptions.

6. What reasons might create (false) beliefs in the claim by the proponent and followers?

Both the textbook and the lectures will supply you with many reasons why an experiment such as Crider's seems to give positive results. Subjective or Personal Validation turns out to be untrustworthy. Language is ambiguous. Everyone possesses all traits. We differ from one another in terms of the degree to which we exhibit such traits. Am I introvert or extrovert? This depends both on the circumstances and whom I am being compared with. Some other principles that apply here, and that you will learn about in the course, are illusory correlation, the power of the situation, and conversational maxims.