

- 1) Are any of the following generalizations? Explain.
 - a. Seventy-five percent of the customers at Reliable Used Cars buy from Fred.
 - b. Fred sold 75 cars last week.
 - c. The cars at Reliabilities Used Cars are on sale at up to 75% off this weekend.
 - d. There are 20 trees in Jose's yard.
 - e. All of the trees in Jose's yard are pines.
 - f. Men are basically selfish and self-centered.
 - g. Women are basically martyrs, unreflectively serving the needs of others.
 - h. Most college students watch soap operas.
 - i. 99 students attended the first meeting of the Frisbee golf club.
 - j. At least 25% of college students watch soap operas.
- 2) Are any of the above generalizations statistical generalizations?
- 3) Do any of the generalizations above contain potentially misleading "weasel" words?
- 4) For each of the following topics, state whether you are or are not in a position to make a reasonable generalization, and why. In each case, discuss the issues involved and the problems you may encounter in forming a generalization. Giving examples of possible generalizations, discuss how you could improve the sample to yield a more reliable generalization, and/or modify your generalization to fit your sample more accurately.
 - a. students' work habits
 - b. the policies of a particular political party
 - c. bus service in Chico (or where you live)
 - d. the exams of a particular instructor
 - e. psychology courses
 - f. the attitudes of Americans
 - g. the spending habits of tourists to California
 - h. the color of squirrels
 - i. the price of automobiles
 - j. the reliability of your make of car
- 5) Suppose you were reading reports about 2 studies regarding attitudes about cigarette smoking. One was sponsored by an academic institution; the other was sponsored by a cigarette company. Which sponsor do you think would be more likely to release a complete report of its study's findings? Explain.
- 6) Suppose you wanted to know how many men in the U. S. wear baseball caps. You obtain a list of the names of men in the U. S., mix them up so that each name has an equal chance of being selected, then select the names to call to find out whether they wear felt hats.
 - a. What is the target in the above example?
 - b. What is the sample in the above example?
 - c. How was the sample chosen? Explain and evaluate.
- 7) A poll of *Hispanic* magazine readers found that 64.8% of those responding support affirmative action and 35.1% do not support affirmative action. How many Hispanic people support affirmative action? Explain.
- 8) Suppose you want to find out whether men are basically selfish and self-centered and whether women are basically martyrs, unreflectively serving the needs of others. And suppose you created random samples of men and of women to interview. What challenges would you face in getting to know your samples?
- 8A) If you could not rely on men and women giving knowledgeable and candid answers to these questions, is there some other way you could get the knowledge you seek about your samples?
- 9) Are any of the following questions loaded? What answer would the question tend to elicit? How would you reword the question to remove the load?
 - a. Do you favor a policy that requires judges to give life sentences to third-time offenders as a way of cutting down on violent crime?
 - b. Do you favor prison rehabilitation programs as a way of preventing offenders from returning to crime after they leave prison?
 - c. Do you favor giving judges the authority to consider special circumstances when sentencing third-time offenders?
 - d. Do you favor cutting back on prison rehabilitation programs as a way to cut the exorbitant cost of incarceration?
- 10) Can you conclude from the information given below that more residence hall students think the residence hall food is not nutritious than think it is nutritious? Explain.

47% of a randomly selected sample of residence hall students think the residence hall food is nutritious, and 53% think the residence hall food is not nutritious. Suppose the margin of error is 3% and the confidence level is 95%.
- 10A) Can you conclude from the information in 10 above that it's not at all possible that 59% of the residence hall students think the residence hall food is not nutritious?
- 10B) Can you conclude from the information in 10 that the residence hall food probably is not nutritious?
- 11) Identify the samples and the targets in the following.

- a. Social scientist Richard Nisbett, who lives in Ann Arbor, Michigan, reports that he once thought restaurants in Palo Alto, Ca., were better than restaurants in Ann Arbor because the restaurants this his co-author, Lee Ross, took him to when Nisbett visited Ross in Palo Alto were so good.
- b. Civic leader: "Charges of police brutality and deplorable prison conditions are unreasonable. I saw no evidence of them during my prison tour."
- c. Suppose you want to determine the attitudes of college students about requiring students to own computers. You select the incoming class of Harvard to question. Everyone you select answers the questions you ask.
- d. Suppose you want to know the attitudes of students at your unidersity about the new president. You divide a list of the students into males and females, then select at random individuals from each group to question. Everyone you select answers the questions you ask.
- e. Suppose you want to know whether college-aged women tend to see themselves as overweight. You do a random sample of the white sorority women on your campus. Everyone you select answers the questions you ask.
- f. Suppose you want to know whether students on your campus believe that football should be funded in a tight budget. You stand at the football stadium, questioning students who come to the Saturday game. All of the students you approach answer your questions.

11A) Are there any reasons to suspect sample bias in any of items in 11? Explain.

12) Discuss the wording of the following questions. Consider, e.g., whether any of them are loaded; encourage candid answers about potentially embarrassing topics; are open-ended, allowing for more individual answers; or are vague or ambiguous. Explain your answer.

- a. About how many times a week would you say you watch soap operas?
- b. Do you watch soap operas frequently, rarely, or not at all?
- c. Do you think foreign students should watch fewer soap operas so they'll have more time to study for their classes?
- d. Do you think foreign students should watch more soap operas to help them learn English?
- e. What do you think about students watching soap operas?
- f. Do you think critical thinking should be a required class?
- g. About how many times have you waited until the last minute to do your critical thinking assignment?
- h. Do you think critical thinking should be required so students will make better decisions?
- i. Do you use critical thinking in your major?
- j. Do you think critical thinking should not be required so students will have more opportunity to take classes they believe will help them with their careers?

13) Suppose you have a co-worker who you see only at work. She's been acting grumpy for the 6 months that you've known her. What possible explanations can you think of for her grumpiness?

14) Are any of the following causal hypotheses untestable or questionably testable? Explain.

- a. "Plastic makes it possible." (Slogan on an ad sponsored by the American Plastics Council)
- b. "You *can* do it. Whatever your goals in life, a healthy does of inspiration works wonders. Our Success Stories--from women who have been there--reveal the secrets of a healthy lifestyle to help you take action and reap the rewards." (From an ad for *Shape* magazine)

15) Read these examples; then, for each example, answer the questions that follow.

Example A

For 20 years now, doctors have been debating whether ear creases--lines in the earlobe that tend to appear in middle age or later--are somehow linked to heart disease. William Elliott, a cardiologist at Rush Medical College in Chicago, originally thought the connection was "a big bunch of malarkey." But last year, he announced that in his 8-years study of 108 men--half with ear creases--those with lined lobes were 8 times more likely to develop heart disease than crease-free men.

Example B

A few winters ago a dozen investigators independently reported figures on antihistamine pills. Each showed that a considerable percentage of colds cleared up after treatment.

- a. Are there any correlations described in either of the examples?
- b. Are there any temporal orderings described in either of the examples?
- c. Does the information in example A establish that ear creases cause heart attacks? Explain why or why not.
- d. Does the information in example B establish that taking the antihistamine pills made the colds go away? Explain why or why not.
- e. Do you have any other points to make or questions to raise about either example?

16) Dr. Quong, a clinician and medical researcher, wants to study the potential effects of a new drug on a group of adults with AIDS. Dr. Quong is quite hopeful about this new drug because he noticed a dramatic improvement in one of his patients who received the drug. Dr. Quong selects a group of adults with AIDS at random and from that group selects at random a control and experimental group. Dr. Quong gives the new drug to the experimental group and gives a placebo to the control group. Suppose Dr. Quong finds a statistically significant improvement in the experimental group? May Dr. Quong conclude that the patients in the experimental group improved because of the new drug? If so, what would you suggest that Dr. Quong do to improve his experiment.?

17) Do you see any ethical problems with Dr. Quong's research described in 16?

18) Suppose Professor Hernandez's experiment revealed that students on average learned faster when using a computer than when not. Can you conclude that you will definitely learn logic faster if you use a computer? Explain.

19) If you had \$100 million to fund a causal study, would you rather find out the preventive effects of a drug or the preventive effects of diet? Explain why.

- 20) List as many explanations as you can think of the following.
- John Berry, a 19-year-old college student wearing a baseball hat with the bill in the back, comes into Professor Any Stern's office. John stays in Stern's office about 20 minutes and does not take off his hat. Professor Stern regards taking off one's hat as a sign of respect. Why doesn't John take off his hat?
 - 50% of all working artists are women, but only about 15% of the work shown by museums and galleries was created by women. Why?
 - 13 sea otters were found dead along the coast of Monterey Bay beach. There were no visible wounds, and at the time there was a "red tide," which sometimes kills the sea otter's main source of food. Why did the sea otters die?

21) Are any of the following causal hypotheses untestable or questionably testable? Can you think of any evidence that would count for or against them? Explain.

- John doesn't take off his hat when he comes in a room because he is a disrespectful person.
- The reason why John doesn't take off his hat is that unbeknownst to him, there is a magic force floating around him that controls all of his actions and prevents him from taking off his hat.
- The reason why John doesn't take off his hat is that the last time he took it off, he placed it in wet tar without realizing it, and now it's stuck to his head.
- Listening to Mozart during math quizzes improves students' scores.
- Taking a critical thinking class improves critical thinking.
- The hypotheses you generated in 20 above.

22) Do any of the following passages contain causal conclusions that are based on insufficient evidence? Explain. Discuss, among other things, whether the reasoning expresses the post hoc fallacy (either in its temporal form or correlation form). Also discuss whether the passages contain information relevant to generating a causal hypothesis.

- Young women intellectually improve more when they attend all-female schools for a couple of years than when they attend co-ed schools exclusively. Therefore, attending all-female schools for a couple of years helps young women improve intellectually.
- "[A] study in the *Journal of the American Medical Association* concluded that nonsmoking women exposed to a moderate amount of second-hand smoke at home face a 30% increased risk of lung cancer; those living with a heavy smoker, an 80% increased risk, and those exposed at work, a 39% risk." This study shows that second-hand smoke contributes to developing lung cancer.
- Sue dials Ginny's beeper number. A few minutes later, the telephone rings. It's Ginny. Sue thinks, "Ginny must have called because I beeped her."
- Helmut's electric hot-air popcorn popper recommends running the popper for 3 minutes before putting in the popcorn. Helmut wants to know what would happen if he didn't following the directions, so he puts in some popcorn immediately after turning on the popper. A bunch of the kernels don't pop. The kernels don't pop because Helmut didn't let the popcorn popper run for 3 minutes.

23) Do any of the conclusions in the passages below follow with certainty? Explain why or why not.

- Eating chocolate causes an effect similar to falling in love, so you'll feel good after eating this chocolate candy.
- Petunias require water to survive, and my petunias haven't received water for a year. So my petunias are dead.
- I must hit "save" for my computer to save material. I didn't hit "save" during the last 5 minutes of typing. My computer just shut down by itself. So I have lost the last 5 minutes of typing.
- My stove requires gas to work. It's not working. It must be out of gas.
- Putting fish emulsion on my plants helps them bloom. I haven't put any fish emulsion on my plants this year. My plants won't bloom this year.
- Putting fish emulsion on my plants helps them bloom. I have been putting fish emulsion on my plants. My plants will bloom.

Which fallacy is involved in each of the following?

- I'm a father of 2 daughters. When I hear this argument that we can't protect freedom in Europe, in Asia, or in our own hemisphere and still meet our domestic problems, I think it's a phony argument. It's just like saying that I can't take care of Luci because I have Lynda Bird. We have to take care of both of them and we have to meet them head on.
--former president Lyndon Johnson
- Sorority girls are so conceited. Margaret and Sarah didn't even speak to me yesterday when they saw me in the hall.
- I think his daughter's marriage must have worried him dreadfully. She was his only child, you know. He never talked about her but I noticed his hair began to turn white after the wedding.
- You're not going to take a course from Harris, are you? I know at least three people who say he's terrible. All three flunked his course, as a matter of fact.
- Student government is a mistake from the beginning. Look what happens in homes where parents let children run things their own way!
- Have you ever noticed that there's an interesting correlation between the strength of feminism and the length of skirts? Traditionally, as women stand up to be counted, their hemlines rise, too.
- In the years prior to the outbreak of recent wars there has always occurred an increase of armaments among the belligerents. It's obvious, therefore, that increased armaments is the cause of war.
- No sooner did they start to fluoridate the water but my friends began dying of heart disease. It just doesn't pay to tamper with nature!
- I spent all morning canvassing for the committee to reelect our representative. Here I was, in a typical upper-middle-class neighborhood--prime Republican territory--and yet 11 of the 19 people I talked to who had made up their minds are going to vote Democratic this year. Well, that does it, no more canvassing for me. Our candidate doesn't have a chance.
- When you think of what some people have accomplished without a college education, you'll agree with me that it'll be a waste of time to spend 4 years there.
- American parents aren't opposed to school busing programs. We've had such a program in Berkeley for a number of years, and it's worked out quite satisfactorily.

- 12) President Truman, regarding the stopping of atmospheric testing of nuclear weapons: We should never have stopped it. Where would we be today if Thomas Edison had been forced to stop his experiments with the electric bulb?
- 13) From American Rifleman: The value you place on a course that appeals to the nonshooting public depends entirely upon how much you value your freedom under the Second Amendment. Bear in mind that the antigun syndrome is an illness and that education is the prescription for a cure.
- 14) Jeff: That stuff's not my regular beer!
Sue: That beer was on sale, so I bought it.
Jeff: If dirty socks were on sale, would you buy them?
- 15) Why should we criticize and punish human beings for their actions? Whatever they do is an expression of their nature and they cannot help it. Are we angry with the stone for falling and the flame for rising?
- 16) More and more young people are attending high schools and colleges today than ever before. Yet there's more juvenile delinquency and more alienation among the young. This makes it clear that these young people are being corrupted by their education.