JREF COURSE GUIDE

HOW TO THINK ABOUT DUBIOUS CLAIMS

A COMPANION TO THE 10 LECTURE VIDEO COURSE BY RAY HYMAN, PROFESSOR EMERITUS, UNIVERSITY OF OREGON

Smart people can act stupidly by failing to apply their intelligence wisely. This course draws lessons from scientist smart people who went astray. The course provides a framework to help you avoid their mistakes.

Ray Hyman is a professor emeritus of psychology at the University of Oregon. Hyman's published research has been in such areas as pattern recognition, perception, problem solving, creativity, and related areas of cognition. He has written and published extensively on the psychology of deception and critiques of paranormal and other fringe claims.

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THE 10 LECTURE VIDEO COURSE CAN BE VIEWED HERE »

LECTURES

Lectures for this course can be found at **youtube.com/randifoundation** under the "How To Think About Dubious Claims" playlist.

These lectures are organized into five pairs or sets. Each lecture will be an hour in duration. This guide will list the topics for each lecture as well as the theme for each set. I will use demonstrations as "pointers." Each demonstration points to one or more concepts or themes.

SET 1: BEWARE OF UNAIDED OBSERVATION!

Lecture 1: The Keys to Critical Thinking

Uri Geller. The Geller Effect. Two students attempt to bend a key with their minds. The problem of unplanned observation. Eyewitness testimony. GIGO. "As described is not the same as "as it happened."

Lecture 2: How The Key Got Bent

Student descriptions of the key bending event. Impossibility of describing everything. Observation has to be selective. Problem of relevance. Informal observation is retrospective, unsystematic, and contaminated by the limitations and quirks of human memory and cognition. Scientific observation is prospective, planned, systematic, calibrated and productive of trustworthy data.

SET 2: WHY SMART PEOPLE CAN BE SO STUPID

Lecture 3: Perceptual and Cognitive Biases: Fast and Slow Thinking

Reflective Mind/Algorithmic Mind/Autonomous Mind. The Cognitive Miser. Mindware Gaps. Contaminated Mindware. Finished Files. Assimilation /Contrasts. Invisible Rectangle. Attneave's Cat. Shepard's Tables. 7C→7S

Lecture 4: "The Reality of ESP: A Physicists Proof of Psychic Abilities": The Vividness Problem

"Other ways of knowing." Strength of belief vs. strength of proof. Prima facie evidence. Miracles. Scientific ability is domain dependent. Disciplinary Matrix as a safety net. Patrick Price. Remote Viewing. Occult chemistry. Helen Duncan. Madame Blavatsky. Subjective Validation.

SET 3: HOW TO OVERCOME COGNITIVE BIAS: A SYSTEMATIC FRAMEWORK

Lecture 5: The Framework: How, and When, to Override the Autonomous Mind.

The Conditional: if,then thinking. Popper's failed ploy to banish inductive thinking from science. Theory, Hypothesis, Initial Conditions, Auxiliary Conditions, Predicted Outcomes. Alternative reasons for the outcome. Application to the key bending demonstration.

Lecture 6: Applications of the Framework

Polarity Therapy. Crider: "The study of a character analyst." Additional applications.

SET 4: THE PSYCHIC READING: SUBJECTIVE VALIDATION ON STEROIDS

Lecture 7: The Psychic Reading: How to Convince People that You Know All About Them

Examples of readings: Alan Alda befuddled by reaction of a lady to a reading. Randi successfully re-enacts Forer's demonstration of the fallacy of personal validation. Hyman duplicates Christian Dion's approach to psychic readings. You too can guru!

Lecture 8: Personal Validation, Subjective Validation, and the Contribution of the Observer

Crider revisted. Forer. The rules of the game. Why it works.

SET 5: THE IMPORTANCE OF REPLICABILITY

Lecture 9: Scientists & Psychics: What Happens When Otherwise Competent Scientists Fail to Recognize the Importance of Replicability

Hasted et al on How to Test a Psychic (Uri Geller). Delanoy and the young metal bender. Attempting to do science without a disciplinary matrix and without a safety net.

Lecture 10: Independent Replicability, Meta-analysis and Pseudo-Replicability

The original ganfeld psi experiment (1974). The Hyman-Honorton debate (1985). Storm et al vs Hyman (2010). "Meta-analysis that conceals more than it reveals." Parapsychology, a field without a subject matter, without replicability, but with dogged persistence.

A FRAMEWORK FOR EVALUATING CLAIMS

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 a 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.

In this course we will treat each claim as a *theoretical hypothesis[H]*. We will assume that each claim implies *an explanatory system[ES]* of some sort. The explanatory system, itself, is neither true nor false. A *theoretical hypothesis*, for our purposes, is an assertion or claim that some natural system in the real world is an example or realization of the explanatory system..

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.

We ask you to phrase the claim in an *IF…THEN or conditional format*. The portion that follows the *IF* is called the antecedent and corresponds to the theoretical hypothesis that is in question. The portion that follows the *THEN* is called the consequent. In this course, we will treat the consequent as the outcome of a specific test of the theoretical hypothesis. See below for more extensive discussion of the conditional format.

The components of the conditional format consist of the following:

ES: the *Explanatory System*. The Explanatory System is simply a description or story about a system that can produce certain outcomes. In our framework, an *ES* is neither true nor false.

H: the *Theoretical Hypothesis* is the claim that that the *ES* is true, i.e., that it applies to some system in the real world. In applying our framework we use *The Principle of Charity* and pretend that the evidence put forth to back a claim was gathered as a test of the Theoretical Hypothesis. In a true test, the observer begins with a statement of the Theoretical Hypothesis and derives observable consequences that should occur if the hypothesis is, in fact, true.

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

IC: the *Initial Conditions* refer to the state of some system, person, or object prior to being subjected to conditions that, given the hypothesis, should bring about a specified change in the initial conditions.

AC: the *Auxiliary Conditions* consist of those conditions that are explicitly or implicitly assumed to be necessary for the claimed outcome to occur. Newton's laws of motion, for example, assume that objects are moving in a vacuum. A feather and a bowling ball dropped from the same height at the same time will , according to Newton=s theory, hit the ground at the same time. This will be true, however, only if the test is carried out in a vacuum. If the test is carried out under everyday conditions, the feather will take longer to reach the ground because of the resistance of the atmosphere. As we will discuss in the lectures, auxiliary conditions can be a legitimate part of a claim only if they are articulated before the outcome of a test. Too often, they are brought up after the test as a way to excuse apparent failures.

P: the *Predicted Outcome* is the outcome of the test if the claim is true. We can conceive of the Predicted Outcome as the new state or condition of the system that results if the hypothesis being tested is, in fact, true. For example, many Explanatory Systems are descriptions of systems where certain rituals bring about a cure of some sort. For example, some explanatory systems describe a scenario in which the use of a certain type of crystal can heal a headache. To test the hypothesis that this *ES* is true, we would want to start with individuals who have a headache(*IC)* and, after applying the crystal therapy (applying it correctly would be an *AC*), we would look for changes from this initial condition such that the individuals no longer have headaches (*P*). This is why specifying the Initial Conditions is important. If the individuals did not have headaches to begin with, the fact that they do not have headaches after the treatment is meaningless. Surprisingly, many claims of miracle cures lack explicit evidence of the Initial Conditions.

The Conditional Format: Once you have carefully spelled out the contents of each component of the claim, these components are put together to make the claim in the following format:

IF (H &IC&AC) THEN P.

3. 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. In the conditional format, the evidence usually is what follows after *THEN*. The evidence is contained within the consequent.
[If you have set up the claim correctly in the conditional format, the evidence corresponds to *P*.]

The *Principle of Charity* results in our leaning over backwards here to give the claimant every benefit of the doubt. We are *pretending* that the claimant actually designed a test *in advance of collecting the relevant data*. If the claim had been specified according to our format under question #2, it should have been set out before making any observation relevant to the outcome. Once

the test has been completely specified, then we observe the outcome which can correspond to *P*--a successful outcome as predicted, or to *not-P*--an unsuccessful outcome. For the purposes of our critical evaluation of the claim, we are pretending that the claimant would have reported the outcome of the test regardless of whether it was successful or unsuccessful.

In reality, in almost all cases ,we are being told about the outcome just because it came out successful. The claimant is typically not reporting the outcome of an unbiased test, but rather is selecting,, after the fact, examples that support his or her claim. We are hearing about a particular outcome just because it supports the teller's claim.

4. How strong is the support?

Here you try to evaluate the support. Is it relevant? Is it trustworthy? The strength of the argument supporting the claim depends upon 1) the relevance of the consequent or evidence to the theoretical hypothesis and 2) the quality of the evidence. Some sorts of evidence such as testimonials are untrustworthy whereas evidence collected under double-blind, controlled conditions is of high quality. A very important consideration, as we will see, is how likely the outcome is even if the hypothesis is false. To the degree that the evidence is consistent with possible theories other than the one being tested, it provides little support for the hypothesis being tested.

One important alternative to the results being due to the truth of the explanatory system, is the possibility of a given outcome occurring just by chance. Most outcomes that we will be hearing about can occur for many reasons. Suppose the hypothesis is that crystal healing works and the predicted outcome is that crystal therapy can cure headaches. The crystal healer applies her therapy to an individual with a headache and he reports that he no longer has the headache. This would be inadequate as evidence for many reasons. One obvious reason is that we are dealing with just one case. And headaches come and go even with no intervention of any kind. This particular outcome simply could be the result of chance. At the very least, we would want to examine the outcomes from several cases.

5. What would be adequate support?

What kinds of arguments and evidence would adequately support the claim? How could you find or get such support? Hopefully you will learn why good evidence must meet criteria such as operational definition, controlled conditions, double-blind, etc.

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

SAMPLE CASE #1

I present two cases for analysis. Each case is followed by a possible analysis using the framework. *Before you look at my analysis, try doing your own analysis using the framework.* Thinking is a matter of *doing*. The more practice you have in applying the framework, the better you will do. I strongly urge you to do your own analysis before looking at mine. When you compare your analysis with mine, remember that many different analyses are possible. No one analysis is necessarily the best.

POLARITY THERAPY

The following is extracted from Cooper-Hunt, Major C.L., M.A. (Cantab). Ps.D., Ms.D., D.D., Ph.D., M.S.F. (1969). *Radiesthetic Analysis*. Mokelumne Hill, CA: Health Research.

Whether one employs a rod or a pendulum or one of the latest instruments designed to detect and measure the radiations of the human body in its many cell-groups, there is almost an infinite number of findings, which can be of the utmost value to an enquirer.

One very useful reading--to begin at the beginning of our specialized form of analysis which my wife and I have evolved over the years in our Radiesthetic Healing Practice--is the polarity of the patient.

Hitherto it had always been thought that we should sleep at night with our heads to the North and our feet to the South. We have found through Radiesthesia that this varies with the individual. Some should sleep with their head to the South East or South West, North East or North West according to the finding on the instrument.

As to the supreme importance of this we cannot say as yet, and since we are not anxious to produce faddists or to disrupt the domestic harmony by dislocating the arrangement of the furniture, we do not lay down an inflexible law for any patient. At the same time we have found the item to be of practical value clinically. May I cite two cases of actual fact.

The first was a patient who complained of acute insomnia, which nothing would relieve. We discovered that the lady was sleeping with her head in the wrong polarity. Radiesthetic examination indicated a different alignment and the patient advised to try it out. She braved the domestic strife and her subsequent report was complete harmony and sound sleep. In other words during the hours of nightly refreshment the Cosmic Forces of renewal were unhindered by incorrect polarity in the sleeper and were allowed to flow freely through the inner Being of the patient.

The other case I can cite was that of a little girl, who was greatly troubling her household by extreme restlessness during the night. She was brought to us for a test of polarity and our advice was adhered with an immediate satisfactory result of complete harmony and deep sleep.

I can only add therefore in conclusion that the test of polarity and the applying of it in this way, provided that friction is not caused in the household, seems worthwhile. It is easily ascertainable, by any worker with the pendulum or rod, etc., by holding a specimen of the patient=s blood or hair or hand-writing in the receiving hand (left hand of a right-handed operator), maintaining the desired thought in consciousness, whilst functioning with the power-hand, which holds the pendulum.

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

ANALYSIS OF SAMPLE CASE #1

1. What is the issue or question?

Can insomnia and restless sleep be cured by having people sleep in alignment with their polarity? Can an individual's polarity be diagnosed by using a dowsing instrument?

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

Major Cooper-Hunt is citing his two cases just because they support his belief in polarity therapy. We do not know how many other cases he has encountered and how many of them have also resulted in successful outcomes, if any. However, we use the principle of charity and try to formulate his claim as if he had actually conducted a test. The component parts of the claim are:

ES: The *Explanatory System* in this case appears to be a hypothetical system in which people have polarities and sleep harmoniously when they sleep in a position that is consistent with their polarities. They will encounter disturbances in their sleep patterns if they sleep with their bodies oriented out of harmony with their polarities.

H: The *Hypothesis* is that this ES is true. It applies to the real world.

IC: The *Initial Conditions* are that we start with individuals who are diagnosed to be sleeping in positions out of harmony with their polarity and who are suffering insomnia or restlessness during sleep.

AC: Some possible *Auxiliary Conditions* are that the diagnosis is properly made and that the clients do change their sleeping positions as instructed by the therapist.

P: The *Predicted Outcome* is that when the clients re-orient their sleeping positions to be consistent with their polarities they will no longer suffer sleep disturbances.

The complete claim, in the conditional format, now becomes: *IF (H & IC & IC) THEN P*. Or to flesh it out fully: *IF (POLARITY THERAPY IS VALID and IF WE INSTRUCT AN INDIVIDUAL WHO HAS BEEN SLEEPING IN A POSITION INCONSISTENT WITH HER POLARITY AND IS SUFFERING FROM SLEEP DISTURBANCE TO CHANGE HER SLEEPING ORIENTATION TO BE IN HARMONY WITH HER POLARITY and THE CLIENT FOLLOWS INSTRUCTIONS) THEN SHE WILL NO LONGER SUFFER SLEEP DISTURBANCE.*

3. What reasons are offered to support the claim?

Here the predicted outcomes were two individuals who, after following instructions, no longer suffered sleep disturbance.

4. How strong is the support?

For any claim in the conditional format, at least three critical conditions must be satisfied:

Condition 1: The predicted outcome must logically follow from the antecedent if the *ES* is true. For example, the *ES* in this case clearly states that people who sleep in harmony with their polarities will be free of sleep disturbances. Suppose Cooper-Hunt gave us as support that one his clients won the lottery after altering her sleeping position to be in alignment with her polarity. This would be questionable evidence for polarity therapy because nothing in the *ES* as described says anything about winning lotteries. In other words, the predicted outcome must be *relevant* to the *ES* and *H* being tested.

Here we can assume that Condition 1 has been satisfied if the *ES* is as Cooper-Hunt has described it. We are using the Principle of Charity here because we are assuming that Cooper-Hunt did not change his *ES* after the fact to fit the actual outcome that he observed.

Condition 2: Condition 1, however, is insufficient to insure a good test of the claim. This is because the predicted outcome can occur for reasons other than the truth of the hypothesis. The conditional claim guarantees the predicted outcome if the hypothesis, the initial conditions,and the auxiliary conditions are satisfied. By itself, however, the claim does not exclude the possibility that predicted outcome might occur for other reasons. To guard against this possibility, a good test should insure that the probability of *P* is very unlikely if *H is false*. In other words we want the following condition to hold:
If (not-H & IC & AC) then very likely not-P.

What about Condition 2 in this case? If ES is not true, is it plausible that we would observe two individuals sleeping well after realigning their sleeping position to be consistent with their polarities? The answer is >Yes.= And this could be so for a number of uncontrolled reasons. One reason is that people can have periods of restless sleep followed by sound sleep for no apparent reason. A second reason is the placebo effect--because they believe that they will sleep better by changing their orientations, this might be sufficient to enable them to sleep better. This is also known as a self-fulfilling prophecy. A third reason is that we have heard only about two cases. What if we observed several more cases? Would they all have the same outcome? In other words, we need much more data.

Condition 3: Another important requirement for a good test is that we have to make sure *prior to to observing the outcome* that the criteria for deciding whether *P* (success) or *not-P* (failure) have been clearly and objectively established. This obvious requirement is very frequently violated. For example, the dowser Henry Gross located on a map a place to drill a well in Bermuda. Gross and his followers claim that the well was successful. The authority that I contacted in Bermuda said that the well was a failure because the water it produced was sea water and undrinkable. Gross=s supporters argue that the well was a success but that the users were withdrawing the water in such a way that they were mixing the good with the bad water.

This third condition could also present a problem for Cooper-Hunt=s case. He does not make it clear what criteria were used to determine the sleep disturbances of his clients and how it was decided that they had in fact

improved. Did a physician or other expert independently examine the clients before and after? Were clear cut criteria for success or failure established in advance?

Even using the principle of charity, we can see that the support for the claim in this case is weak. Two cases are insufficient. Even in these two cases, the criteria for success or failure are vague. And alternative causes for the apparent successes such as placebo effects, spontaneous remissions, and self-fulfilling prophecies have not been eliminated.

5. What would be adequate support?

The general answer here is a test that meets all three conditions. For Condition 3, we would want an independent and blind expert to determine the initial state of the clients and their condition after the treatment. The experts should be blind in the sense they should not be aware of which clients have been given the true treatment. We would also want a blind control comparison to cover Condition 2. One possibility is to have several clients with sleep disturbances. All would be diagnosed for polarity by the dowser, but none would be told the results. Then we could have several of them reverse their sleeping orientations. Half of these would be now sleeping in alignment with their polarity and half would be sleeping out of alignment. If the blind expert, under these conditions, found that significantly more of those who are now sleeping in alignment with their polarities got better as compared with those who are now sleeping out of alignment, this would constitute reasonable support for the hypothesis.

SAMPLE CASE #2

In 1944, the psychologist Crider published a study of a psychic or character reader[4]. 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.
25. Has many big dreams.

Crider stated 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

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

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 cause 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 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 accurately assess character. He suggests that she can do so by means unrecognized by psychology or science. We can put his hypothesis in the *conditional format*[5]. To do this we need to identify the following components of a conditional claim:

i. ***Explanatory System.*** In the present example, the *ES*, although vague and implicit, can be said to be about a *psychic system*. In a psychic system individuals, known as psychics, can obtain information, by means unknown to science, about individuals.

ii. ***Theoretical Hypothesis.*** Although the *ES* cannot be true or false, the theoretical hypothesis can be true or false because it states that the theory happens to be true of some real world system. In the present example, the theoretical hypothesis states that Margarita is a real world system that is also a psychic system. We will symbolize the theoretical hypothesis by the letter *H*. We will always try to rephrase any claim such that the theoretical hypothesis is what is being tested. The claim is that the theoretical hypothesis is true.

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[5] This part of the framework is loosely based on Ronald Giere=s suggestions for testing theoretical hypotheses in Giere, R.N. (1979). Understanding scientific reasoning. New York, NY: Holt, Rinehart & Winston.

iii. ***Initial Conditions.*** A good rule of thumb is that the *IC* describe the state of the system prior to the predicted outcome *P*. Here the predicted outcome is that Margarita will accurately describe the students. So we would want to insure *IC* such that Margarita is presented with students whom she does not know anything about by conventional means.

iv. ***Auxiliary Conditions.*** Generally, we have to consider extraneous factors that could interfere with the outcome of any test of a theoretical hypothesis. In the current example, an auxiliary condition might be that the conditions under which Margarita is making her statements are such that they do not interfere with her powers. We have to be careful here. The auxiliary conditions often are brought up as an escape clause when the test of the claim does not support the claimant. To be reasonable, any auxiliary condition must be clearly stated before the test is conducted and should be agreed to by all parties. We will symbolize the auxiliary conditions by the letters *AC*. Further *AC* include conditions such that she is given no obvious information about the clients during the reading--such as clues from their dress, physical appearance, and reactions.

v. ***Prediction.*** The prediction refers to the outcome of the test of the theoretical hypothesis. A good prediction has to be carefully specified so that the outcome can be objectively determined by all parties. All possible outcomes have to be classifiable, *before* any observations are made, as either confirming or disconfirming the hypothesis under test. Unfortunately, Crider did not clearly specify in advance what was going to count as a successful outcome and what was going to count as an unsuccessful outcome of his test of Margarita. Crider is not alone. Almost all people who argue that their claims are supported by outcomes, rarely specify clearly in advance what was going to count as a success. More important, a good test is one that clearly spells out in advance exactly what outcomes will *falsify* the claim. He points to two sources of evidence in favor of Margarita=s claim. One is that 96% of the statements she made about his students were accepted by them as true. The other is his own impressions that what she said about his students agreed with what he knew about them. What if the students had accepted as true only 80% of the statements? Would he still have considered that a successful outcome? What about 70% or 60% or 50% or 40% or 30%, etc.? One possibility is that Crider, like many other people, had assumed that 50% acceptance was chance, and that any significantly higher percentage was evidence that Margarita could do better than chance. So let=s assume that the predicted outcomes were as follows: 1) success (any percentage of hits above 50%), and failure (any percentage of hits of 50 or lower). We symbolize the prediction by the letter *P*.

The general conditional format for any claim in symbolic form would be:

IF (*H & IC& AC*) THEN *P*
For this particular case, this would be something like the following:

IF (*Margarita is a psychic* & *if she makes statements about individuals about whom she has no information gained through normal means* & *if nothing in the situation interferes with her powers*) THEN *the individuals will accept more than 50% of her statements as accurate descriptions of themselves*.

3. 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. Notice that in our rephrasing of the claim in the conditional format, we focused on just one prediction--the one about the percentage of statements accepted as true by the clients. The fact that Crider points to three different kinds of outcomes to support his conclusion raises interesting questions. Depending when and how the possible outcomes were specified, multiple outcomes could make the argument stronger or weaker. We will discuss such matters during the lectures.

Only the first reason offers the possibility for an objective determination of whether the outcome of the prediction was successful or not. The second two reasons are useless as evidence because they are based on subjective opinions and are easily influenced by factors other than the actual accuracy of the statements.

4. How strong is the support?

Ideally, we should be able to decide if a test of a theoretical hypothesis is a good or bad test *before the outcome of the prediction is known*. This is because, as we will emphasize throughout this course, a good test satisfies at least three important conditions

Condition 1: The predicted outcome actually follows logically if the theoretical hypothesis is true. This will be the case if we have carefully specified the conditional claim:

If (H &IC & AC) then P.

Condition 2: However, Condition 1 by itself is insufficient for a good test of *H*. This is because the predicted outcome could occur for reasons other than the truth of the hypothesis. To guard against this possibility, a good test should be one where the probability of *P* is very unlikely if *H is false*.

If (not-H & IC & AC) then very likely not-P.

Condition 3: In addition to making sure we select *P* such that it is unlikely to occur unless *H* is true, we have to make sure that whether *P* or *not-P* will be the outcome of the test can be objectively decided in a clear-cut fashion by all observers.

In Crider's test of Margarita, he did not clearly specify his prediction in advance. We have used *the principle of charity* in reconstructing his claim. *The principle of charity* states that we should always try to evaluate a claim by formulating it in the strongest, possible form. In our reconstructed form, Condition 1 seems reasonable. That is, it makes sense that if Margarita is truly psychic, the students will accept most of her statements as true of themselves. Crider's case is considerably weakened by his failure to fulfill Condition 3. Nowhere does he state what his specific prediction had been and how we

could decide whether it had succeeded or failed. Using the Principle of Charity we have tried to help out by specifying an objective prediction that he might have had in mind. However, even if we consider Condition 3 to be met, we will find that Condition 2 is questionable. In other words, further examination raises doubts about whether *P* is unlikely if Margarita is not a psychic. In other words, we have good reason to suspect that a large proportion of the statements will be accepted as true by the students even if Margarita has no psychic abilities. 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. Consider, as well, that this study was conducted in the early 1940s when females traditionally did not go to college. The few who did came from upper class families and would obviously be healthy, well-off, etc.

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? In the sample analysis we find statements such as: *Digestive organs normal. Heart normal. Kidneys normal*. How many young, female college students from upper-class families are going to have abnormal digestive, heart, and kidney problems?

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

5. 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 we will discuss 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 that they believed were made for them. Under these circumstances both groups accept the same proportion of statements as accurate self-descriptions.

You will usually find a good answer to this question by focusing on how to fulfill Conditions 2 and 3. Condition 2, for example, reminds you to consider what would be outcome if the theoretical hypothesis is false. What if Margarita has no psychic powers? One way to find out is to compare her performance with someone who does not claim psychic powers.

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 with whom I am being compared. 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.

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? In the sample analysis we find statements such as: *Digestive organs normal. Heart normal. Kidneys normal*. How many young, female college students from upper-class families are going to have abnormal digestive, heart, and kidney problems?

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