

Critical Thinking Skills Tutorial:

**Facts, Inferences,
and Judgments**

Writing Center

English 800 Center

**YOU DO NOT NEED TO PRINT THIS
TUTORIAL!**

**All notes and exercises should be
done on separate sheets of paper, which
you will bring to your conference with
an instructor in the center.**

**As you work through the tutorial, make
sure to see an instructor in the
Writing Center or English 800 Center
if you have any questions or difficulties.**

Facts, Inferences and Judgments

Introduction

Critical thinking involves taking ideas apart, untangling their complications and evaluating them carefully. But this is a complicated business. It's not always easy to say exactly what is wrong or right, reasonable or unreasonable about an opinion.

So: the first step in making sense of an opinion is to understand exactly what kind of statement it is.

There are three kinds of statement:

- statements of fact;
- statements of inference;
- statements of judgment.

Once you have determined what kind or kinds of statement you are dealing with, you can start your analysis.

Please note: The following definitions are subtle. You will need to think hard, take notes and read the examples carefully. Just memorizing the opening definition will not be enough. Additional explanations are available if you want!

IN YOUR NOTES: Write down answers to the following questions (keep these to submit with exit quiz):

1. What does critical thinking involve?
2. What kinds of statement are there?

The Subjective and the Objective

You have probably heard people use the words "objective" and "subjective" to refer to their perspectives. If we tell someone to "think objectively," we usually mean that he should overcome his feelings and try to understand a situation from other points of view. If we say someone is being "subjective," we usually mean that he is too wrapped up in his emotional response to see the big picture.

This does relate to the philosophical meaning of the words, but it can be misleading. Here is a better approach, one which will help you understand the distinctions between statements of fact, inference and judgment.

Western philosophy makes a fundamental distinction between the objective (the world outside us) and the subjective (the world of human nature).

The objective world

We talk about things that exist out there. We identify animals and trees, we discuss how to fix our car or whether the Honda Accord has a better safety record than the VW Beetle. We try to figure out what causes breast cancer or diabetes, and what we can do to avoid these conditions. We try to figure out what caused the dinosaurs to die off or how to lower the number of welfare recipients. We try to understand global warming, and to learn which plants grow in which kind of soil. These involve contemplating the world out there--the objective world.

1. Objective things exist whether we believe in them or not. If I decide that you don't really exist, you don't just stop existing, do you? Your existence doesn't depend on my belief. You are there. Another example: Paris is the capital of France. You may not believe or know this, but it's true, and remains true regardless of what you think about it. These are objective realities.
2. We can be wrong about the objective world. You cannot say, "Well, I believe that the dinosaurs died out because they ate too much chocolate, so it's true for me." No: the statement is either true or not. Objective reality is not shaped by our interpretation.

For instance, doctors often make mistakes about the causes of illness. Ancient European doctors believed that many diseases were caused by an imbalance in body fluids, typically by a person having too much blood. So, a woman suffering from (for instance) ovarian cancer might be recommended by her doctor to apply leeches--a kind of blood-sucking slug--to her body. The idea was that the leeches would drink the excess blood, and the patient would be restored to health. Now, these doctors fervently believed that they understood the causes of disease. And so did their patients. But their cures often didn't work, because despite their beliefs, they were completely wrong. There is no such thing as "excess blood," and no cancer patients ever got better by having blood-sucking slugs burrowing tiny jaws into their flesh!

3. The objective world is not ambiguous. It cannot be one thing to you, and another thing to me. It is what it is. For instance, suppose you and I both look at a giraffe.

ME: This is a raccoon.

YOU: No. It's a giraffe.

ME: (graciously) Well, to you it's a giraffe. But to me, it's a raccoon.

No! We have a commonly agreed definition of both animals, and we can't make these categories up for ourselves.

The subjective world

But human beings also have an inner world, a world of the imagination. In this world, we think about the way we would like things to be; we look at our responses to experiences, and characterize them as good or bad, pleasant or unpleasant. We perceive certain sights as beautiful and others as ugly; we try to describe what we feel, by using terms that are not always clear. This involves contemplating the subjective world -- the world within.

1. Subjective responses exist if we believe in them, and not if we don't. If you enjoy peanut butter and bacon, then it is enjoyable -- to you. If I think it's disgusting, it's disgusting -- to me. The experience of eating peanut butter and bacon is not a single unchanging thing. Whatever we believe or feel about it becomes the truth.
2. Subjective responses are not right or wrong in the same way. Because we can't hold a subjective response up to a single, independent standard, we can't really say it's right or wrong. You would be incorrect if you thought that peanut butter was made from boiled walrus, because it's not -- that's an objective fact. But are you incorrect if you think it tastes like boiled walrus? Maybe -- maybe not. There's no real right or wrong here.
3. The subjective world is ambiguous. Subjective terms often mean different things to different people. If I tell you that I am 5' 4" and weigh 155 pounds, that is an objective statement. For everyone, a foot is twelve inches and a pound is sixteen ounces. But suppose I told you that I was fat. That would be a subjective statement. It tells you, not what I weigh, but how I feel about what I weigh. Think how this word means different things to different people, and how differently it is used. For instance, one magazine described how Oprah Winfrey (at 5' 7") "slimmed down" to a "svelte" 150 pounds, from over 250 pounds. Clearly, for her, 150 pounds was svelte and slim. Meanwhile, another magazine described how the supermodel Cheryl Tiegs (also 5'7") "ballooned up" to 150 pounds from about 110. How can one woman be svelte, and another a balloon, when they weigh the same? The answer lies in how they are perceived.

Subjective & Objective Ideas

Here's a round-up:

Objective statements

- describe things that exist whether we believe in them or not;
- can be right or wrong;
- refer to concepts that mean the same thing to everyone.

Subjective statements

- are true only if we believe them, and are not true if we don't;
- are not necessarily "right" or "wrong";
- refer to concepts that can mean different things to different people.

Bearing these characteristics in mind, read over the following list of statements and see if you can understand why each is classified as objective or subjective:

Objective

Shaquille O'Neal is 7'3" tall.

A Big Mac has 530 calories.

Paris is the capital of France.

Marco earns \$175,000 a year.

Bob drinks a bottle of gin daily.

Caffeine raises your pulse rate.

Dinosaurs were wiped out by the climactic changes caused by a meteor striking the earth.

Subjective

Shaq is a very big man.

Big Macs taste like wet cardboard.

Paris is a beautiful city.

Marco is rich and successful.

Bob has a real drinking problem.

You shouldn't drink lots of coffee.

It's a good thing the dinosaurs died out -- the earth is already too crowded!

You'll encounter the terms "subjective" and "objective" as you move through the module. Keep the distinction in mind.

IN YOUR NOTES: Write down answers to the following question (keep these to submit with exist quiz):

3. What are the features of objective and subjective statements?

Statements of Fact

Statements of fact put forward verifiable assertions. In order to evaluate a statement of fact, you would verify the information.

Read the following statements through very carefully. Some are true and some are not; but all are statements of fact.

- Peanut butter is made from boiled walrus.
- There are 2,309,203 ravens alive in California today.
- George W. Bush is the President of the United States of America.
- Chickens are birds.
- Chickens have twelve wings each.
- The singer Madonna is 43 years old.
- Sacramento is the capital of California.
- *Beloved* is a novel by Toni Morrison.

Characteristics of statements of fact:

Fact characteristic #1: Statements of fact refer to objective reality.

An objective statement is a statement about objective reality. This means that it is either true or untrue. A statement of fact cannot be true for one person and untrue for another. Peanut butter either is or is not made from boiled walrus (it isn't!), and its ingredients can't be changed by what we think it is made of. *Beloved* either is or is not written by Toni Morrison (it is). If two people disagree over a statement of fact, at least one of them must be wrong.

Fact characteristic #2: Statements of fact are supported by verification.

If you want to establish the ingredients of peanut butter, you simply check the jar, or make a chemical analysis. You can look at the ingredients of peanut butter. You don't need to argue or explain what "peanut butter" means to you.

IN YOUR NOTES: Write down answers to the following questions (keep these to submit with exit quiz):

4. What are the important characteristics of a statement of fact?
5. Are they necessarily true?
6. How do you evaluate or support a factual statement?

Statements of Inference

Statements of inference put forward assertions that guess at unseen relationships between things. They are statements about the unknown, based on what we do know or can observe. In order to evaluate a statement of inference, you would verify any facts and assess whether the connection drawn between them has been adequately justified.

Read the following statements through very carefully. Some are commonly accepted and some are not; but all are inferences.

- Peanut butter makes you put on weight.
- Smoking causes lung cancer.
- Brushing with fluoride makes your teeth stronger.
- Frank sustained a blow to the head which later caused his stroke.
- Running ten miles a day caused Jenna's knee injuries.
- Emissions from factories are causing global warming.
- Drinking water keeps your skin moist.
- Since all virtually all American-born drug addicts ate peanut butter and jelly sandwiches as children, we must conclude that peanut butter and jelly sandwiches cause drug addiction.

Characteristics of statements of inference:

Inference characteristic #1: Statements of inference refer to objective reality, though they cannot be directly observed.

Like statements of fact, inferences are either true or untrue. If two people disagree over an inference, at least one of them must be wrong. For instance, fluoride either contributes to your dental strength, or it doesn't.

However, establishing the truth of an inference is a lot harder than establishing the truth of most facts, because inferences are always unseen; you have to guess them based on what you do see. When you make an inference, you're interpreting reality rather than merely observing it, and people can and do differ over interpretations. So sometimes people will disagree over an inference, and there won't be any way of knowing for sure who is right. However, there is a "right answer" out there.

Inference characteristic #2: Statements of inference are supported by verification of any facts, AND by an explanation of how they are connected.

If you want to argue that smoking causes lung cancer, you must first verify the facts: how many smokers on the one hand, how many incidences of lung disease on the other. But it's not enough to show us the facts. You must also explain why you think the facts are related--why it's the smoking that causes the cancer, and not some other unifying factor. The facts might be true and the inference unreasonable.

For instance, it probably is true that virtually all American-born drug addicts ate peanut butter and jelly as children; but verifying these facts alone would not justify the (very unreasonable!) inference that peanut butter and jelly sandwiches cause drug addiction. To argue this, you would have to show that it was the sandwiches that led to the drug addiction.

People are often wrong about inferences. Here is just one example. In years past, medical men seeking to understand the cause of cholera noticed that cholera epidemics usually started in neighborhoods that smelt bad. They inferred that the bad smell caused the disease. But they were wrong. In fact, bacteria in raw sewage cause cholera. So, although the scientists correctly guessed that the smell and the disease were connected, they were wrong about the connection--both were effects of the real cause.

IN YOUR NOTES: Write down answers to the following questions (keep these to submit with exit quiz):

7. What are the important characteristics of a statement of inference?
8. How do you evaluate or support a statement of inference?
9. Can people disagree over inferences, even when they agree about the facts?

Statements of Judgment

Statements of judgment put forward assertions about our values: tastes, morals or beliefs about what is normal. In order to evaluate a statement, you must verify any facts, consider whether any inferences are sufficiently justified, and consider whether you are persuaded by the speaker's values or opinions.

Read the following statements through very carefully. Some are commonly accepted and some are not; but all are judgments.

- Steamed leather is delicious.
- Meat is murder.
- Roses are beautiful, and smell good too.
- Giggling in church is not appropriate behavior.
- Torturing animals is fun.
- Having sex with ten-year-olds is wrong.
- Mark is a terrible alcoholic.
- Nicholas was beside himself with joy.
- Cats are lovely pets.

Characteristics of statements of judgment:

Judgment characteristic #1: Statements of judgment are subjective.

Unlike statements of fact or inference, judgments are neither right nor wrong. Two people can disagree about a statement of judgment and both of them can be "right". Judgments reflect our tastes: I may think cats are lovely pets, but perhaps the way they pad silently about the house gives you the creeps. They also reflect our morals: while you might think meat is murder, I might think that eating meat is perfectly OK. People can and do differ over tastes and morals.

But this doesn't mean that we can't, or shouldn't, argue about them. Some values are richer and more persuasive than others.

Also, just because judgments are subjective, that doesn't mean that we don't impose them on the world. Indeed, the criminal code reflects our evolving moral judgments. For instance, it used to be quite common for children to have sex; Shakespeare's heroine Juliet is a thirteen-year-old child when she has sex with Romeo. The play depicts this as a beautiful love scene, but today, Romeo could go to prison.

Judgment characteristic #2: Statements of judgment are supported by verification of any facts, explanation of any inferences, and an attempt to persuade readers of the values or perspective implied.

The first two kinds of support make sense. If you are arguing that sex with children is harmful, you will need to establish facts about child abuse; you will also need to establish a cause-effect inference (the sex causes some kind of emotional harm). But you also need to tell us why you consider the effect to be undesirable. You need to tell us about your moral view of the universe, and try to get us to see things your way.

We often talk as though we shouldn't discuss subjective matters--that because we can't prove a subjective statement to be "true" or "false," we should just leave it alone. "We're all entitled to our opinion," we say.

But this is foolish. Of course we can argue about subjective opinions. As noted above, trying to persuade others to see our point of view is an important part of discourse. Some of the most important and interesting arguments stem from our attempt to get others to accept our values. Philosophers, prophets and reformers have all produced subjective arguments that have developed the human race. Explaining our values is part of life.

Also, listening to other people explain their values helps us examine our own. We may reject a belief that we had always embraced, because someone else forces us to see the world from his perspective. The activist C. P. Ellis grew up as an avowed racist, and a

card-carrying member of the Ku Klux Klan. But by listening to other perspectives, he eventually challenged and rejected those values.

In short, arguments about subjective realities are as important to our development and knowledge as objective knowledge.

IN YOUR NOTES: Write down answers to the following questions (keep these to submit with exit quiz):

10. What are the important characteristics of a statement of judgment?
11. Are judgments subjective or objective? What does this mean?
12. How do you evaluate or support a statement of judgment?
13. If people disagree over judgments, must one of them be wrong?

I STILL DON'T GET IT....

No problem! Let's try another approach.

Our opinions reflect the world outside our heads, and the world inside our heads.

1. THE WORLD OUTSIDE: Statements about Objective Reality (facts, inferences)

Statements of fact reflect our observations. We experience the world through our senses, and we make a statement of what we have perceived. Look at the scene below; what do your eyes tell you?



Facts: "There is a donkey attached to a cart. The cart has tires on the wheels, and is laden with boxes. A man in white stands on the right, and a man in dark clothes seems to move forward on the left."

Statements of inference reflect our guesswork. Our senses give us facts, but our imaginations interpret them and see patterns and connections. What happened here?



Inferences: "The cart driver must have overloaded the cart and tipped the donkey up. The man on the left has just seen what's happened and is running towards the donkey."

Both kinds of statement (fact and inference) deal in objective reality. When we identify the creature pulling the cart as a donkey, or claim that the cart was overturned because of the weight on the cart, we are talking about objective realities.

- This means that there is a right or wrong answer. The man on the left is or is not the cart's driver; maybe he is running towards the dangling donkey, or maybe he is running on some unconnected errand. Whatever the truth here is, it does not depend on our interpretation. It is what it is.
- But this doesn't mean that statements about objective things are always right. No. The reality may be objective, but we aren't. Our senses can trick us (is that a man or woman running towards the donkey? And is the person even running?). We may make an honest guess which is wrong (perhaps the donkey reared up and knocked the cart over). We almost certainly color our perceptions with our prejudices (we may jump to conclusions based on our preconceptions about the culture we think we're looking at). Statements about objective reality, therefore, may be biased or just plain wrong.

2. THE WORLD INSIDE: Statements about Subjective Reality (judgments)

Statements of judgment reflect our values. Observations and inference produce statements that are either correct or not. Values, however, are different. They come from inside our heads; the same statement might be true for one person and not for another. While we can and do share a lot of our tastes and morals with other people, especially other people from our own background, they are not correct or incorrect in the same way. Do you agree with these reactions?



Judgment: "That man is being cruel to his donkey; some animal rights group should set it free. On the other hand, let's face it, it's hilarious."

Statements of judgment deal with subjective reality. When we talk about the way people should treat a donkey, or whether the scene is funny or painful, we are talking not about objective reality but about our response to it--about our values--about subjective reality.

- This means that there is no right or wrong answer. Suppose that driver does usually make his donkey pull very heavy weights: whether that's cruel or not depends on our beliefs about how animals should be treated. We may find it cruel to overwork a donkey, but his owner might find it cruel that we keep birds in cages or neuter our cats.

- But this doesn't mean that there's no point in discussing values; they're just opinions, so they're all equally valid. NO! You don't believe that; no one does. If we did, there would be no criminal law. It's perfectly OK to argue over tastes. Most of us have come to appreciate a film or a piece of music that we would otherwise have hated, because a friend made us see what he saw in it. That's what it means to be open-minded. Even more vital is learning to think critically and talk effectively about our moral values. If I think your treatment of an animal is cruel and makes it suffer, I will try very hard to get you to embrace my opinion. Above all, some values are more reasonable than others. Values that are founded on incorrect facts and weak inferences, and that are full of inconsistencies, deserve much less attention than values that reflect objective, sober reflection and that are consistent.

Conclusion: You've completed your study of the explanation. Here are three final questions for your notes:

IN YOUR NOTES: Write down answers to the following questions (keep these to submit with exit quiz):

14. In your own words, explain the meaning of the terms statement of judgment, statement of inference and statement of fact.
15. What is meant by the terms "objective" and "subjective?"
16. Which kinds of statement deal in objective reality, and which deal in subjective reality?

Exercise 1

Instructions: For questions 1-20: decide whether each statement is a statement of *fact*, *inference* or *judgment*, OR a *combination* of more than one. For questions 21-30: Decide whether the statement is *objective* or *subjective* (namely, whether it deals in subjective or objective realities.)

1. Paris is the capital of France.
2. Broccoli can help prevent certain kinds of cancer.
3. God exists.
4. Peanut butter is delicious.
5. Peanut butter is delicious, but it makes you fat.
6. Frank has an alcohol problem.
7. Frank drank half a bottle of gin before dinner; he sure knows how to have fun.
8. I'm selling my Volkswagen bug for \$500--that's a bargain.
9. The car is six years old and has 35,055 miles on it.
10. Because this car is fairly new and has low mileage, it won't break down.
11. Shakespeare wrote the greatest poetry in the English language.
12. There are over 6 billion people alive today.
13. The planet is overcrowded.
14. If the planet were not overpopulated, we would see fewer outbreaks of famine in the world.
15. Dogs can speak French.
16. In fact, dogs can speak excellent French.
17. Mary is an unusually intelligent girl.
18. In order to be eligible for ENGL 165, CSM students must have taken ENGL 100 with a grade of C or higher.
19. I came down with a cold in April, started taking echinacea, and by July it was gone: the echinacea must have worked!
20. San Francisco is a beautiful city.

21. Los Angeles, on the other hand, is a hideous city.
22. Los Angeles has a population of 14,859,430 and is situated over 500 miles from San Francisco.
23. Marvin's weight gain was caused by his habit of eating a Krispy Kreme donut every morning.
24. Marvin is getting too fat; he should go on a diet.
25. The actress Angelina Jolie has starred in a number of very successful films.
26. She is dating Brad Pitt, who played the central character in "Seven."
27. The movement of the tides is caused by people coughing. When enough people cough on one coast, the water is pushed out; when they cough on the other coast, the water is pushed the other way.
28. Moby Dick is a novel by Herman Melville.
29. Well, it's just my opinion, but I believe that after our death, we will experience whatever we have been expecting. Those who believe in the afterlife will live forever, while those who do not will just cease to exist.
30. Child abuse should be stopped.

You are now ready to take the exit quiz.

- You can get a printed version of the quiz at the Writing Center, OR
- You can print out the quiz at the end of this tutorial, and complete it at home.

YOUR NAME: _____ Date: _____
G# _____ Course# _____ Instructor _____

FACTS, INFERENCES & JUDGMENTS: Exit Quiz -- Directions

- Print this page, and your notes from the tutorial if you have kept them online. (If not, make sure you have your notes with you.) Complete this quiz.
 - Take this quiz, **and your notes with answers to all questions** to the Writing Center to be checked. **NO** appointment is needed for this. However, if you do not pass the quiz, you must make a conference appointment for feedback and credit.
 - **REMEMBER:**
 - However well you do on the quiz, the instructional aide **cannot** give you credit unless he or she can clearly see that you have responded to all questions.
-

Decide whether the following statements are facts, inferences or judgment. Circle the answers you think are correct.

1. Cats are extremely beautiful.

FACT INFERENCE JUDGMENT

2. People shouldn't wear white shoes after Labor Day.

FACT INFERENCE JUDGMENT

3. 99% of cats in the U.S.A. have earned a college degree.

FACT INFERENCE JUDGMENT

4. Industrial pollution contributes to global warming.

FACT INFERENCE JUDGMENT

5. Last year, nine out of ten prisoners in Example County were rearrested within six months of their release from prison.

FACT INFERENCE JUDGMENT

6. The victim's death was caused by a blow to the head.

FACT INFERENCE JUDGMENT

7. We should all make an effort to recycle glass and aluminum.

FACT INFERENCE JUDGMENT

8. Recycling glass and aluminum will help the economy.

FACT INFERENCE JUDGMENT

9. During Clinton's term as President, the economy grew; so he must have done a good job.

FACT INFERENCE JUDGMENT

10. The moon is made of green cheese.

FACT INFERENCE JUDGMENT

11. The more you beat your dog, the more likely he is to bite.

FACT INFERENCE JUDGMENT

12. Vicious dogs should be put down.

FACT INFERENCE JUDGMENT

13. In my opinion, herbal remedies cured my arthritis.

FACT INFERENCE JUDGMENT

14. Ever since it started raining, water has dripped into my living room.

FACT INFERENCE JUDGMENT

15. There must be a hole in my roof.

FACT INFERENCE JUDGMENT

16. Frank felt sick to his stomach and decided to lie down.

FACT INFERENCE JUDGMENT

17. The new drug suppressed cold symptoms in nine out of ten patients.

FACT INFERENCE JUDGMENT

18. Its side effects were unpleasant, however; they included abnormal hair loss and ugly swellings.

FACT INFERENCE JUDGMENT

19. If the government did not spend money on arms, it would spend more on social programs like welfare.

FACT INFERENCE JUDGMENT

20. Social programs are more important than defense.

FACT INFERENCE JUDGMENT

TO BE COMPLETED BY THE INSTRUCTIONAL AIDE:

_____ (initials) _____ (date)

1. Tutorial notes are COMPLETE / INCOMPLETE (____/15 questions)

2. Score on exit quiz: ____/20

3. Conference with instructor required for credit? YES / NO

ATTENTION!

STOP!

Now that you are at the end of this tutorial and have taken the Exit Quiz, please bring it, with your tutorial notes and exercise answers, to the Writing Center in 18-104 or the English 800 Center in 18-102 and ask the Instructional Aide to correct your quiz.

If you pass the quiz, the Instructional Aide will give you credit for this tutorial.

If you did not pass the quiz, you will need to make an appointment with a lab instructor. During this appointment, you will review your incorrect answers and ask any questions you may have about this tutorial. You will receive credit for the tutorial after this appointment.

Remember that you may go to the Writing Center or English 800 Center at any time in this process to ask questions and seek help.