Chapter 3

Facts:
What's Real?

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"People, the facts are inescapable. Any ideas on how we can ignore them?"

This cartoon tells us something we all know about facts: it is one thing to get them right, but it's another to face up to what they mean.

Facts are more complicated than most of us think. For one thing, they are commonly confused with opinions, beliefs, and inferences. For another, it takes a lot of skill to assess their reliability. Finally, facts

are not synonymous with truth. This is a chapter whose purpose is to enable you to recognize, state, and assess facts with more knowledge and assurance.

DISCOVERY EXERCISES

The following three Discovery Exercises can be done on an individual or collaborative basis; they can be done outside class in preparation for discussion or in class itself.

Beginning with the Word *Fact*

After consulting one or more dictionaries, write down your own definitions of the following words: *know, certain, existence, occurrence, actual, real, verify, confirm, fact.*

Share your definitions of *fact* with one another in class. Does your definition contain some of the following elements?

1. **Fact** comes from the Latin *factum,* meaning a deed, something done.
2. A fact is something known with certainty to exist or have existed.
3. A fact can be verified (or confirmed as true and accurate) through experience, observation, testing, measurements, testimony and records.
4. A fact is something that people can generally agree is real and true.

Learning to Recognize Facts

Answer the following questions in writing, in preparation for a class discussion.

1. Make a list of five facts about yourself, beginning with your birth date.
2. How many people are in your classroom? Write down your total and when your instructor gives the signal, call out your number. Did you all agree?
3. List five facts about the room you are in right now. Do not just name objects or events (such as lights, door), but make statements describing what you see in its context. For instance, do not say "Four windows" but say "There are four open windows on the south wall of this room."
4. Which of the following are statements of facts?

a. Human blood is grouped into four types: A, B, AB, and O.
b. One centimeter is the equivalent of 0.3937 inch.
c. The major religion in Mexico is Roman Catholicism.
d. The food is awful in the cafeteria.
e. Amelia Earhart was the first woman to fly solo around the world.
f. Everybody should have health insurance.
g. He must have forgotten his keys; they are on the table.

5. Explain why items 4d through 4g are not facts.

Critical Thinking Hero: A Whistleblower with Facts

A whistleblower is an employee or member of an organization who witnesses misconduct and reports it to the public or authorities for investigation and corrective action. In many well-known cases, the whistleblowers' decisions to speak up endangered their lives but resulted in far-reaching positive effects for society as a whole.

In 1995 Dr. Jeffrey Wigand, a biochemist research director and vice president of a major tobacco company, decided to go public on what he knew. He arranged to appear on *60 Minutes* to reveal that the executives of Big Tobacco knew for 30 years that tobacco was addictive (despite their denial before Congress); moreover, they manipulated cigarette ingredients to increase their nicotine impact, using additives with known carcinogenic effects. The whole complex story is told in the 1999 movie *The Insider*. One major outcome of Wigand's action was the historic $368 billion settlement in 1998 by four of the largest tobacco companies with the attorneys general of 40 states. These tobacco companies agreed to change their marketing practices, and to make annual compensatory payments to the states for the medical costs of caring for those with smoking-related illnesses.

Writing or Class Activity

1. Have there been other long-term public health effects of Wigand's action?
2. Many other whistleblowers have been more controversial with stories far more dramatic. Do some research on Hugh Thompson, Karen Silkwood, Joe Darby, and Linda Tripp. Or discuss other whistleblowers that interest you.

Verifying Facts

Data are not considered facts until their existence or truth can be verified (or agreed to be accurate) by reliable sources. Verification comes from direct observation, witness testimony, records, documentation, and testing. Read the following list of facts. Select three to study. Aside from using the Internet, how would you verify that each statement is indeed a fact?

1. One tablespoon is the equivalent of three teaspoons.
2. The composer Amadeus Mozart died at the age of 36.
3. Until 1893 lynching was legal in the United States.
4. A rainbow can only be seen in the morning or late afternoon.
5. Eritrea was once the northernmost province of Ethiopia.
6. The highest mountain peak in the world is Mt. Everest at 29,035 feet.
7. All snow crystals are hexagonal.
8. The word *Bible* comes from the Greek word *biblia,* meaning a collection of writings.

Facts and Reality

When you compare definitions of the word *fact* in several dictionaries, you may end up puzzled. At *Dictionary.com*, for instance, you would have found that a fact is something that actually exists, known to exist, and known from observation as well as something *said to* be true or *alleged* to have occurred.

Now you might wonder how a word that means something "that actually exists" also means something "supposed to have happened"? Or how could a fact be "either actual or alleged"? While dictionaries only reflect usage, one wonders if such usage also reflects (and creates) public confusion about facts. We seem to lack a word to describe things claimed to be facts but not yet conclusively verified as such. The closest we come are through the words *information, claims, data,* and *raw data.*

If you were to stand on a street corner and ask each passer-by to define a **fact**, most would tell you that a fact is what is real and true. However, this notion is not entirely correct. Facts are only our *interpretations* of what is real and true. And sometimes these interpretations prove to be right, at least for a period of time, and sometimes dead wrong. Here is a recent example. In 2011 an Israeli scientist, Dan Shechtman was awarded the Nobel Prize in chemistry for a discovery he made in 1982 that was then mocked and ridiculed by his colleagues. While looking through an electronic microscope at a mix of aluminium and manganese crystals, he

noticed that the atoms were arranged in a pattern hitherto assumed to be impossible. His colleagues deprecated his discovery, saying it was "against the laws of nature." Then they expelled him from their research group. Yet by 2010 his discovery of quasicrystals had been widely replicated and confirmed, resulting in practical applications such as new instruments for eye surgery. What science learned was that quasicrystals were a fact and their belief about the laws of nature was wrong.

Science moved forward in this case because facts long assumed to be true were re-examined. Thus we need to continually re-evaluate what we may call facts in light of the feedback received from repeated testing against reality.

What, then, is reality?

Reality in Shechtman's case was what he (and later others) agreed was in the microscope. Yet reality is another familiar term diffiult to define. In the previous chapter, you were offered a number of very different definitions, some by philosophers who have long debated the nature of reality. Philosophers have divided themselves into two camps: those who consider reality to be relative and those who view reality as absolute. In other words, some say the observer determines what reality is, while others say that

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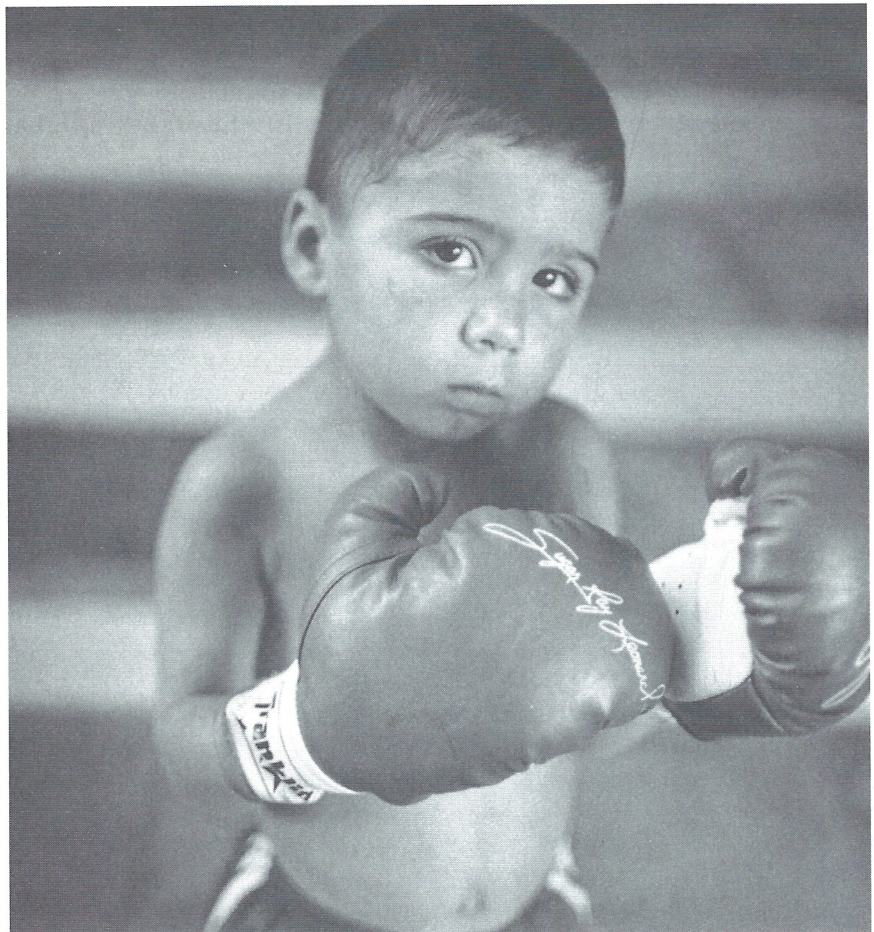
reality is what it is—regardless of what people may think about it. Yet, no matter what side we may lean toward ourselves, we must concede that our judgments do change about the reality of what had been considered facts.

In summary, facts are not the equivalent of truths or reality; they are, at best, only our decisions about what seems to be most real. Human beings need facts because they need certainties in order to proceed through the world. But we should not forget that human beings are fallible.

Discussion Break Questions

1. State two facts that you are certain are true.
2. State two facts that you are certain will never change.
3. State two facts that you are certain will change.



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Facts Are Not Absolutes

> The most we can say about any fact is that its certainty is higher or lower in probability.

Facts that are most useful to us are those that have been repeatedly verified by many sources over time. Our lives and welfare depend on these certainties. On this planet we know that the fact of gravity limits what we can do and not do safely; we know that we can plan our daily schedules around the rising and the setting of the sun. But none can say that the orbit of this planet or its condition of gravity will always remain the same. We live in a physical universe that is eternally changing—from the invisible-to-the-eye subatomic level to obvious levels of wrinkles in our skin, the courses of rivers, the growth of children, and the motion of the sun and stars.

The sciences have their own way of coming to terms with the problem of certainties. Many statements that most of us would call facts are considered *probability* statements by the sciences. If a thermometer says the temperature is 65 degrees, a scientist would say that there is a 99 percent chance that the temperature is between 62.5 and 67.5 degrees. This would take into account any inaccuracies of the instrument. *Certainty* in science is usually considered to be a probability that is approaching certainty. In our human social history, beliefs that have often been mistaken for facts sometimes change as human knowledge evolves. The belief that some women were witches was assumed to be fact in Europe and the United States for centuries. In nineteenth-century England, parents believed it necessary to "break the wills" of their children and beat them regularly in order to "civilize" them. And in the future many of our present cultural assumptions, thought to represent facts, may be found mistaken as well. Thus we need to preserve the freedom to debate, the right to disagree, the right to investigate one another's claims about facts, truths, and realities. Indeed, this is the only kind of environment in which critical thinking can flourish.

A government that seeks absolute power over its citizens suppresses every stimulus to critical thinking. It buys out the media, censors a dissident press, discourages public protests, closes down schools, and imprisons those who dissent. Critical thinking is a fragile product of civilizations that value the freedom to search for truth. For the advancement of human knowledge and welfare, we need to value the right to continually re-examine whatever equations are made between reality, truth, and "facts."

Discussion Break Questions

1. Discuss a belief that you feel absolutely certain about. Discuss a belief that you are uncertain about.
2. Give an example of some methods used to suppress critical thinking.

Feelings Can Be Facts

Feelings can deceive as well as illuminate.

We often hear that we should be objective and not subjective in order to determine facts. This warning is needed to remind us that apathy, anger, fear, envy and prejudice can distort our perceptions and keep us from seeing things objectively. However, many interpret this familiar advice to mean that all feelings are "subjective"—and therefore irrational and unreliable—or that they invariably keep us from knowing what is true. This is a false belief. There are times when feelings, such as mistrust, can

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lead us to be more cautious, ask more questions, or seek more information. If it turns out that our mistrust led us wisely, we might decide to give it more attention in the future. If the mistrust proves excessive, we can learn from that as well. But here what is important is that we remain objectively aware of our feelings. And awareness does not mean acting upon them. We can hate the taste of a bitter medication, yet decide to take it because our health depends on it. A subjective or unaware attitude, on the other hand, might lead to only following what feels most comfortable, dismissing the long-term consequences. Thus, attitude can be objective, in the sense of being under conscious control, or subjective, in terms of reactive and impulsive. Ambulance attendants, police officers, or fire fighters may flinch when they see a maimed or burned person, but nevertheless carry on with their work. Personal reactions of aversion cannot be allowed to interfere with professional duty. Yet this does not mean that professionals need to deny what they are feeling in order to function well.

There are many circumstances in which a careful consideration of our feelings offers vital information. We need this sensitivity in human relationships. We also need such sensitivity in order to interpret art. Look, for instance, at the photo on the previous page. Suppose that you first react to the photo by feeling startled, amused or uneasy, then curious. Such feelings might draw you to look more closely in order to learn more.

When we are studying art, we give attention to our feeling reactions, because they aid us in better understanding a work's meaning. Artists, like the photographers whose pictures appear in this book, intentionally try to provoke reactions. Indeed, you cannot come into objective contact with a work unless you can assess how it affects you. A feeling of curiosity or amusement is a fact for you. The same happens in public performances where people laugh and cry or feel fear or awe together, sharing the same feeling response. Here the feelings became a shared reality, a fact.

Let's now return to the terms *objective* and *subjective*. Some believe that in order to be objective, a person must deny or suppress any feelings, because feelings keep one from being coolly rational and observant. Certainly this belief expresses an ideal. But, without faking, can it be achieved? Let us then consider how we might proceed with more honest realism about our feelings. We can learn how to observe, rather than react to, our feelings—to observe while feeling them at the same time. This means simply allowing feelings to be present without ignoring, denying, or suppressing them. When we are subjective about feelings, we are unaware of how they are influencing our thoughts and decisions and can react blindly to their directives. Unrecognized feelings can distort our reasoning and lead us to deceive others and ourselves. When subjectivity rules us, we cannot clearly discern what is real and true. However, when we take our feelings into account, staying present both with them and in what lies before us, we come closer to that ideal of objectivity.

3. If group pressure can affect us this much in such a simple problem as determining the relative length of a line, what do you think are the implications in more complex problems such as public opinion on controversial issues?
4. If you are familiar with the story The *Emperor's New Clothes*, what parallels do you see between its theme and Asch's experiment?

Facts and Our Limited Senses

Both science and wisdom are needed to help us compensate for the limitations of our senses.

We have seen how consensus and conformity influence perception and thus limit our ability to know the facts. But even aside from the influence of social pressure, we are limited in our ability to know some facts because of the limits of our senses. We now know that dogs can hear levels of pitch that we cannot and that butterflies can see colors invisible to us. If we look at a chart of the electromagnetic spectrum, the portion visible to us is only a tiny slit in the whole band. We have to use instruments—X-rays, radar, the seismograph, smoke detectors—to compensate for our sense limitations.

But aside from all this, our senses are affected by many other variables such as mental preoccupations, distractions, or our varying degrees of alertness in different circumstances. How much do you actually see on your commute route? How much attention do you pay to background sounds when you live in the city? Has a friend ever complained you didn't notice when he shaved off his beard?

Another human failing is that we interpret what we perceive on the basis of our experience. Moreover, this experience may be too narrow and limited to embrace what lies before us. The Buddha once succinctly illustrated this point and more in the following wise parable.

READING

The Blind Men and the Elephant

Once upon a time a king gathered some blind men about an elephant and asked them to tell him what an elephant was like. The first man felt a tusk and said an elephant was like a giant carrot; another happened to touch an ear and said it was like a big fan; another touched its trunk and said it was like a pestle; still another, who happened to feel its leg, said

Standards We Use to Determine Facts: *Verifiability*, *Reliability*, *Probability*, *Plausibility*, *Accuracy*, and *Currency*

In any situation, when we need to think critically, the first thing we have to determine is what the facts are. We solve practical problems through facts, such as proving the payment of a bill; we seek facts in every form of investigation, whether in a court of law or a geographical survey. This primary need for facts has led to the development of standards for determining both their existence and their reliability. When we think critically, we fully understand and use these standards, many of which have already been suggested in this chapter. Let's now look directly at six of them: verifiability, reliability, probability, plausibility, accuracy, and currency.

Verifiability, as you must now know, means the data can be confirmed by another source. This source can be a reference source (such as a dictionary), a record (such as a marriage license), or a standard (such as Greenwich mean time). Another source could be the testimony of a witness or an expert. Data can also be verified by the senses of a witness, by agreements among people, by measurements, and by documentation.

A correlating standard is the **reliability**, both of the source and the information content. Does the source have qualifying credentials and a reputation for reliability? Does the witness, writer, or speaker show signs of bias? Do all the claims appear true, accurate, and free of errors? Are the documents genuine? Do other sources agree with these findings?

Probability, or the estimate of a likelihood of occurrence, represents another standard used to determine facts. A public figure may give an alibi that does not seem likely or credible. When the infamous gangster Al Capone was investigated in 1929 for non-payment of income tax, he claimed he never made any money since he always gave away whatever he earned to the poor. (Actually he did sponsor free soup kitchens and beer busts.) He also kept all his transactions in cash. Yet given his reputation and lavish lifestyle, his claim seemed improbable.

Another example of a probability issue is the continuing public debate about global warming. Is it really happening and is it man-made? A division has long persisted between those who want to hold out for more evidence and those who claim the evidence is already overwhelming. Thus, facts depend on our observation of the recurrence of things over time, our assessment of the probability of

their existence and their continuation, and our general agreement and cooperation.

Plausibility is a fourth standard for facts, meaning they pass the test of credibility. There is also an old saying, "If it is too good to be true, it isn't." If you get a call saying you had just won a free vacation for two to Hawaii, you might suspect that this win could cost you a lot. Or suppose a friend who borrowed your car calls to tell you it got totalled while he was sleeping in the car by the side of the road. If you ask to see the police report, and he says there is none, then you might throw up your hands. For facts to be accepted, they need to seem plausible.

Accuracy is another crucial standard for facts. In the past, most newspapers would routinely employ fact-checkers to insure the accuracy and veracity of their copy. Today most depend on news services for that service. Once in a while we will read or hear that some event could not be confirmed or that retractions or corrections need to be made. But we cannot always be fully certain of accuracy from any one source. But if we receive our daily news from multiple sources, i.e., several television stations or websites, we can suspect an inaccuracy when we hear or see discrepant accounts or details about the same event.

Currency is a final standard. Information that is factual one day may not be the next. When you go to an airport, you need to check to see if your flight will still leave at its scheduled time. When you pick up information on the Internet, you have to pay attention to any clues about the date of its entry. When you seek out an expert for advice, such as a physician, lawyer, or counselor, you expect them to give you the most current information.

In conclusion, all these standards suggest a few useful rules:

1. Don't believe any facts given to you unless sufficient information is provided about their source to allow verification.
2. Don't totally accept—or take action on the basis of—facts given to you until you verify them for yourself.
3. Don't accept facts that appear implausible, that contain discrepancies or contradictions.
4. When you have an important decision to make, verify all the facts given to you even if they come from someone you trust.
5. Do the additional research to find out if the information you have is accurate and still current.