Were we entirely rational, our conclusions would be grounded in logic and based on evidence objectively weighed. The unconscious features of human psychology affecting belief formation that have been reasonably well established include several that are widely referred to as *cognitive biases.** They skew our apprehension of reality and interfere with our ability to think clearly, process information accurately, and reason objectively.

People will generally accept facts as truth only if the facts agree with what they already believe.

—Andy Rooney, nicely explaining belief bias

For example, we tend to evaluate an argument based on whether we agree with it rather than on the criteria of logic. Is the following specimen good reasoning?

All Golden retrievers are dogs.

Some dogs are gentle.

Therefore some Golden retrievers are gentle.

It isn't. You might as well conclude some Golden retrievers are Basset hounds. After all, all Golden retrievers are dogs and some dogs are Basset hounds. If it took you a moment to see that the first argument is illogical, it's because you know it's conclusion, that some Golden retrievers are gentle, is true.

The tendency to evaluate reasoning by the believability of its conclusion is known as **belief bias.** A closely related cognitive bias is **confirmation bias,** which refers to the tendency to attach more weight to evidence that supports our viewpoint. If you are a Democrat, you may view evidence that Fox News is biased as overwhelming; if you are a Republican you may regard the same evidence as weak and unconvincing. In science, good experiments are designed to ensure that experimenters can't "cherry-pick" evidence, that is, search for evidence that supports the hypothesis they think is true while ignoring evidence to the contrary.

There isn't any hard-and-fast difference between confirmation bias and belief bias; they are both unconscious expressions of the human tendency to think our side of an issue must be the correct side. Thinking critically means being especially critical of arguments that support our own points of view.

Some cognitive biases involve **heuristics,** general rules we unconsciously follow in estimating probabilities. An example is the **availability heuristic,** which involves unconsciously assigning a probability to a type of event on the basis of how often one thinks of events of that type. After watching multiple news reports of an earthquake or an airplane crash or a case of child abuse, thoughts of earthquakes and airplane crashes and child abuse will be in the front of one's mind. Accordingly, one may overestimate their probability. True, if the probability of airplane crashes were to increase, then one might well think about airplane crashes more often; but it does not follow that if one thinks about them more often, their probability has increased.

Bad-mouthing someone is not the same as thinking critically about what he or she says.

Frederic Legrand – COMEO/Shutterstock

The availability heuristic may explain how easy it is to make the mistake known as generalizing from anecdote, a logical fallacy we discuss later in the book. Generalizing from anecdote happens when one accepts a sweeping generalization based on a single vivid report. The availability heuristic is also probably related to the **false consensus effect,** which refers to the inclination we may have to assume that our attitudes and those held by people around us are shared by society at large.*

Another source of skewed belief is the **bandwagon effect,** which refers to an unconscious tendency to align one's thinking with that of other people. The bandwagon effect is potentially a powerful source of cognitive distortion. In famous experiments, psychologist Solomon Asch found that what other people say *they* see may actually alter what we think *we* see.** We—the authors—have students take tests and quizzes using smartphones and clickers, with software that instantly displays the opinion of the class in a bar graph projected on a screen. Not infrequently it happens that, if opinion begins to build for one answer, almost everyone switches to that option—even if it is incorrect or illogical.

If you have wondered why consumer products are routinely advertised as best-sellers, you now know the answer. Marketers understand the bandwagon effect. They know that getting people to believe that a product is popular generates further sales.

Political propagandists also know we have an unconscious need to align our beliefs with the opinions of other people. Thus, they try to increase support for a measure by asserting that everyone likes it, or—and this is even more effective—by asserting that *nobody* likes whatever the opposition has proposed. Given alternative measures X and Y, "Nobody wants X!" is even more likely to generate support for Y than is "Everyone wants Y!" This is because of **negativity bias,** the tendency people have to weight negative information more heavily than positive information when evaluating things. Negativity bias is hard-wired into us: the brain displays more neural activity in response to negative information than to positive information.† A corollary to negativity bias from economics is that people generally are more strongly motivated to avoid a loss than to accrue a gain, a bias known as **loss aversion.**

It also should come as no surprise that we find it easier to form negative opinions of people who don't belong to our club, church, party, nationality, or other group. This is a part of **in-group bias,** another cognitive factor that may color perception and distort judgment. We may well perceive the members of our own group as exhibiting more variety and individuality than the members of this or that out-group, who we may view as indistinguishable from one another and as conforming to stereotypes. We may attribute the achievements of members of our own group to gumption and hard work and our failures to bad luck, whereas we may attribute *their* failures—those of the members of out-groups—to their personal shortcomings, while grudgingly discounting their achievements as mere good luck. The tendency to not appreciate that others' behavior is as much constrained by events and circumstances as our own would be if we were in their position is known as the **fundamental attribution error.**††

Experiments suggest that people find it extraordinarily easy to forge group identities. When assigned to a group on the basis of something as trivial as a coin flip, subjects will immediately begin exhibiting in-group and attribution biases.* In a famous experiment in social psychology, the Robber's Cave Experiment, twenty-two 12-year-old boys who previously hadn't known each other were divided *arbitrarily* into two groups. When the two groups were forced to compete, the members of each group instantly exhibited hostility and other indicators of in-group bias toward the members of the other group.**

Rational Choice?

Critical thinking is aimed at coming to correct conclusions and making wise choices or decisions. We know from everyday experience that desires, fears, personal objectives, and various emotions affect choices. As explained in the text, experimental psychologists have discovered other, more unexpected and surprising, influences on our thinking.

- In a recent experiment, researchers at Yale and Harvard Universities asked subjects to evaluate a job candidate by reading an applicant's résumé, which had been attached to a clipboard. Some of the clipboards weighed ¾ pound; the others weighed 4½ pounds. Subjects holding the heavier clipboard rated the applicant as better overall. Evidently a "rational evaluation" of a person's qualifications may be affected by irrelevant physical cues.*

*Reported by Randolph E. Schmid of the Associated Press, in *The Sacramento Bee,* June 23, 2010.

People make snap judgments about who is and who is not a member of their group. Students transferring into a new high school are branded swiftly. Once, one of the authors and his wife were walking their dogs, not necessarily the world's best-behaved pooches, along a street in Carmel, an affluent town on California's central coast. When the author fell a few paces behind his wife, a well-dressed woman walked by and glanced disapprovingly at the dogs. "Did you see that woman?" she asked indignantly, unaware that she was referring to the wife of the man she was addressing. "You can tell she isn't from around here," she said. She seems to have assumed that the author was from the Carmel in-group, simply because he wasn't connected to the misbehaving dogs.

In a series of famous experiments in the 1960s regarding **obedience to authority,** psychologist Stanley Milgram discovered that a frightening percentage of ordinary men and women will administer apparently lethal electrical shocks to innocent people, when told to do so by an experimenter in a white

coat.† The findings are subject to multiple interpretations and explanations, but the tendency of humans to obey authority simply for the sake of doing so hardly needs experimental confirmation. Not long ago French researchers created a fake TV game show that was much like the Milgram experiment. The host instructed contestants to deliver electrical shocks to an individual who was said to be just another contestant, but who in reality was an actor. The contestants complied—and delivered shocks right up to a level that (if the shock was really being delivered) might execute the man. Whether the subjects were blindly following the instructions of an authority or were responding to some other impulse isn't completely clear, but it is impossible to think that good judgment or rational thought would lead them to such excess.*

Yet another possible source of psychological distortion is the **overconfidence effect,** one of several self-deception biases that may be found in a variety of contexts.** If a person estimates the percentage of his or her correct answers on a subject, the estimate will likely err on the high side—at least if the questions are difficult or the subject matter is unfamiliar.† Perhaps some manifestation of the overconfidence effect explains why, in the early stages of the *American Idol* competition, many contestants appear totally convinced they will be crowned the next American Idol—and are speechless when the judges inform them they cannot so much as carry a tune.††

Closely related to the overconfidence effect is the **better-than-average illusion.** The illusion crops up when most of a group rate themselves as better than most of the group relative to some desirable characteristics, such as resourcefulness or driving ability. The classic illustration is the 1976 survey of SAT takers, in which well over 50 percent of the respondents rated themselves as better than 50 percent of other SAT takers with respect to such qualities as leadership ability.‡ The same effect has been observed when people estimate how their intelligence, memory, or job performance stacks up with the intelligence, memory, and job performances of other members of their profession or workplace. In our own informal surveys, more than 80 percent of our students rate themselves in the top 10 percent of their class with respect to their ability to think critically.

Unfortunately, evidence indicates that even when they are informed about the better-than-average illusion, people may *still* rate themselves as better than most in their ability to not be subject to it.‡‡

Does Kim Kardashian wear too much makeup? The issue is *subjective,* or, as some people say, "a matter of opinion."

Stephen Lovekin/WWD/Shutterstock

That beliefs are generated as much by psychology and impulse as by evidence should come as no surprise. The new car that was well beyond our means yesterday seems entirely affordable today—though our finances haven't changed. If someone invited us to The Olive Garden we'd expect decent fare; but if they suggested we try dining at, say, The Lung Garden, we'd hesitate—even if we were told the food is identical. People will go out of their way to save $10 when buying a $25 pen, but won't do

the same to save the same amount buying a $500 suit.* Programmed into our psyches are features that distort our perception, color our judgment, and impair our ability to think objectively.

Clearly all too often we humans reach conclusions on the basis of emotion and cognitive heuristics like those we have just described, rather than on the basis of disciplined reasoning. Reasoning, it sometimes seems, is used mainly to justify beliefs we already have. And it could be that many or maybe nearly all of our beliefs are held by us simply because they conform to what people we associate with believe.**

"The trouble with the world is that the stupid are cocksure and the intelligent are full of doubt."

—Bertrand Russell

In light of these possibilities, how can one aspire to think critically?

The best advice we can offer is to be aware of one's own fallibility and the universal tendency to give more credence to arguments that support our opinions or harmonize with views prevailing in our social networks. Critical thinkers are suspicious of feelings of certainty, whether found in others or themselves. As Charles Darwin said, "ignorance more frequently begets confidence than does knowledge."† Supreme confidence in his or her conclusions is something a critical thinker is not apt to feel routinely. He or she remembers that the intensity of certitude is often inversely proportional to the strength of the evidence that gives rise to it.

Good habit: Before assenting to a claim that matters, re-check the thinking that got you there.

The following exercises may help you understand the cognitive biases discussed in the previous section.

Exercise 1-8

The following questions are for thought or discussion. Your instructor may ask you to write a brief essay addressing one or more of them.

1. Which of the cognitive biases discussed in this section do you think you might be most subject to? Why?
2. Can you think of other psychological tendencies you have that might interfere with the objectivity of your thinking? For example, are you unusually generous or selfish?
3. Think again about a student (or anyone) contemplating getting a pet. Is there a cognitive bias a person in that position might be especially prone to, when weighing the arguments on both sides?
4. Explain belief bias (or confirmation bias) in your own words, and give an example of a time when you may have been subject to it.
5. What might you do to compensate for a bias factor you listed in questions 1 or 2 in this exercise?

Exercise 1-9

For each of the following attributes, rate yourself in comparison with other students in your class. Are you

a. in the top 10 percent?
b. in the top 50 to 89 percent?
c. in the lower 25 to 49 percent?
d. below the top 75 percent?

- ability to think clearly
- ability to think logically
- ability to think critically
- ability to be objective
- ability to think creatively
- ability to read with comprehension
- ability to spot political bias in the evening news
- IQ

If you answered (a) or (b) about one of the preceding abilities, would you change your mind if you learned that most of the class also answered (a) or (b) about that ability? Why or why not?

Exercise 1-10

Select one of the following claims you are inclined to strongly agree or disagree with. Then produce the best argument you can think of for the opposing side. When you are finished, ask someone to read your argument and tell you honestly whether he or she thinks you have been fair and objective.

- "There is (is not) a God."
- "Illegal immigrants should (should not) be eligible for health care benefits."
- "Handgun owners should (should not) be required to register each handgun they own."
- "The words 'under God' should (should not) be removed from the Pledge of Allegiance."
- "Sex education should (should not) be taught in public schools."

TRUTH AND KNOWLEDGE

At the end of the day, when we are ready to turn out the lights and go to bed, we want the conclusions we have reached through painstaking critical thinking to be *true*—and we want to *know* they are true. However, what are truth and knowledge? Through the years, many competing theories have been offered to account for their real nature, but fortunately for you, we can tell you what you need to know for this discussion without getting mired in those controversies.

As for truth, the most important thing is to understand that an objective belief or claim is either true or false in the normal, commonsense way. Truth and falsity are properties of propositional entities such as beliefs, opinions, judgments, statements, claims, and the like. As mentioned previously, when any of those entities is objective, whether it is true or false does not depend on whether we think it is true or false.

You can assert a claim's truth in a number of ways. In normal conversation, we'd take each of the following as making the same statement:

> A book is on the table.
>
> It is true a book is on the table.
>
> It is a fact a book is on the table.
>
> Yes, a book is on the table.

The concept of knowledge is another that philosophers have contested at a deep, theoretical level despite a general agreement that in everyday life, we understand well enough what we mean when we say we know something.

Ordinarily, you are entitled to say you *know* a book is on the table, provided that (1) you believe a book is on the table, (2) you have justification for this belief in the form of an argument beyond a reasonable doubt that a book is on the table, and (3) you have no reason to suspect you are mistaken, such as that you haven't slept for several nights or have recently taken hallucinogenic drugs. Skeptics may say it is impossible to know anything, though one wonders how they know that. Presumably, they'd have to say they're just guessing.

WHAT CRITICAL THINKING CAN AND CAN'T DO

We think critically when we evaluate the reasoning we and others use in coming to conclusions. Perhaps this remark strikes you as restricted and narrow. A composer, for example, thinks critically when he or she tries to find the right instrumentation to introduce a musical theme. A general thinks critically when he or she defines a military objective and weighs various strategies for achieving it. Dentists think critically when they weigh the likely duration of alternative dental repairs against a patient's life expectancy. Mechanics think critically when they attempt to diagnose mechanical problems by listening to the sound of an engine. People in each walk of life examine considerations that are unique to them.

Yet every discipline, every walk of life, every enterprise without exception involves the two kinds of reasoning we will begin examining in the next chapter. And critical thinking anywhere can be waylaid by emotion, self-interest, wishful thinking, desire to be accepted, confirmation bias, and various other psychological propensities that come with being a human being, and that also will be considered in this book.

Thinking critically won't necessarily tell you whether you should get a dog or whom to vote for or whether there is global warming or why your car won't start. It can, however, help you spot bad reasoning about all these things.

A WORD ABOUT THE EXERCISES

To get good at tennis, golf, playing a musical instrument, or most other skills, you have to practice, practice, and practice more. It's the same way with critical thinking, and that's why we provide so many exercises. For some exercises in this book, there is no such thing as only one correct answer, just as there is no such thing as only one correct way to serve a tennis ball. Some answers, however—just like tennis serves—are better than others, and that is where your instructor comes in. In many exercises, answers you give that are different from your instructor's are not necessarily incorrect. Still, your instructor's answers will be well thought out, reliable, and worth your attention. We recommend taking advantage of his or her experience to improve your ability to think critically.

Answers to questions marked with a triangle are found in the answers section at the end of each chapter.

Recap

We think critically when we evaluate reasoning used in coming to conclusions. Conclusions are beliefs; when they are expressed using true-or-false declarative sentences, they are claims (or statements or assertions). A belief (or opinion or claim or statement, etc.) whose truth is independent of whether people think it is true is objective.

An issue is simply a question. One uses an argument to establish a position on an issue; the position is the conclusion of the argument. Evaluation of arguments can be skewed by emotion, wishful thinking, self-interest, confirmation bias, and other psychological impediments to objectivity.

What follows is a more complete list of ideas explored in this chapter.

- **Claim:** When a belief (judgment, opinion) is asserted in a declarative sentence, the result is a claim, statement, or assertion.
- **Objective claim:** A claim expressing a belief whose truth or falsity does not depend on your or anyone else's having it.
- **Subjective judgment:** A belief that, because you have it, you cannot be mistaken about.
- **"Fact vs. opinion":** People sometimes refer to true objective claims as "facts," and use the word "opinion" to designate any judgment that is subjective.

- **"Factual claim":** An objective claim. Saying that a claim is "factual" is not the same as saying it is true. A factual claim is simply a claim whose truth does not depend on our thinking it is true.
- **Moral subjectivism:** Moral subjectivism is the idea that moral judgments are all subjective judgments. "There is nothing either good or bad but that thinking makes it so."
- **Issue:** A question.
- **Argument:** An argument consists of two parts—one part of which (the premise or premises) is intended to provide a reason for accepting the other part (the conclusion).
- **"Argument":** People sometimes use this word to refer just to an argument's premise.
- **Arguments and issues:** The conclusion of an argument states a position on the issue under consideration.
- **Cognitive bias:** A feature of human psychology that skews belief formation. The ones discussed in this chapter include the following:
  - **Belief bias:** Evaluating reasoning by how believable its conclusion is.
  - **Confirmation bias:** A tendency to attach more weight to considerations that support our views.
  - **Availability heuristic:** Assigning a probability to an event based on how easily or frequently it is thought of.
  - **False consensus effect:** Assuming our opinions and those held by people around us are shared by society at large.
  - **Bandwagon effect:** The tendency to align our beliefs with those of other people.
  - **Negativity bias:** Attaching more weight to negative information than to positive information.
  - **Loss aversion:** Being more strongly motivated to avoid a loss than to accrue a gain.
  - **In-group bias:** A set of cognitive biases that make us view people who belong to our group differently from people who don't.
  - **Fundamental attribution error:** Having one understanding of the behavior of people in the in-group and another for people not in the in-group.
  - **Obedience to authority:** A tendency to comply with instructions from an authority.
  - **Overconfidence effect:** A cognitive bias that leads us to overestimate what percentage of our answers on a subject are correct.
  - **Better-than-average illusion:** A self-deception cognitive bias that leads us to overestimate our own abilities relative to those of others.
- **Truth:** A claim is true if it is free from error.

- **Knowledge:** If you believe something, have an argument beyond a reasonable doubt that it is so, and have no reason to think you are mistaken, you can claim you know it.

Additional Exercises

Here are more exercises to help you identify objective and subjective claims, recognize arguments, identify issues, and tell when two people are addressing the same issue. In addition, you will find writing exercises as well as an exercise that will give you practice in identifying the purpose of a claim.

Exercise 1-11

Identify the conclusion of any arguments contained in the following passages.

1. Conflict in the Middle East is winding down, the economy is good, and consumer confidence is high. It is likely, therefore, that the stock market will continue to rise.
2. Lucy is too short to reach the bottom of the sign.
3. "Can it be established that genetic humanity is sufficient for moral humanity? I think there are very good reasons for not defining the moral community in this way."

—*Mary Anne Warren*

4. Pornography often depicts women as servants or slaves or as otherwise inferior to men. In light of that, it seems reasonable to expect to find more women than men who are upset by pornography.
5.