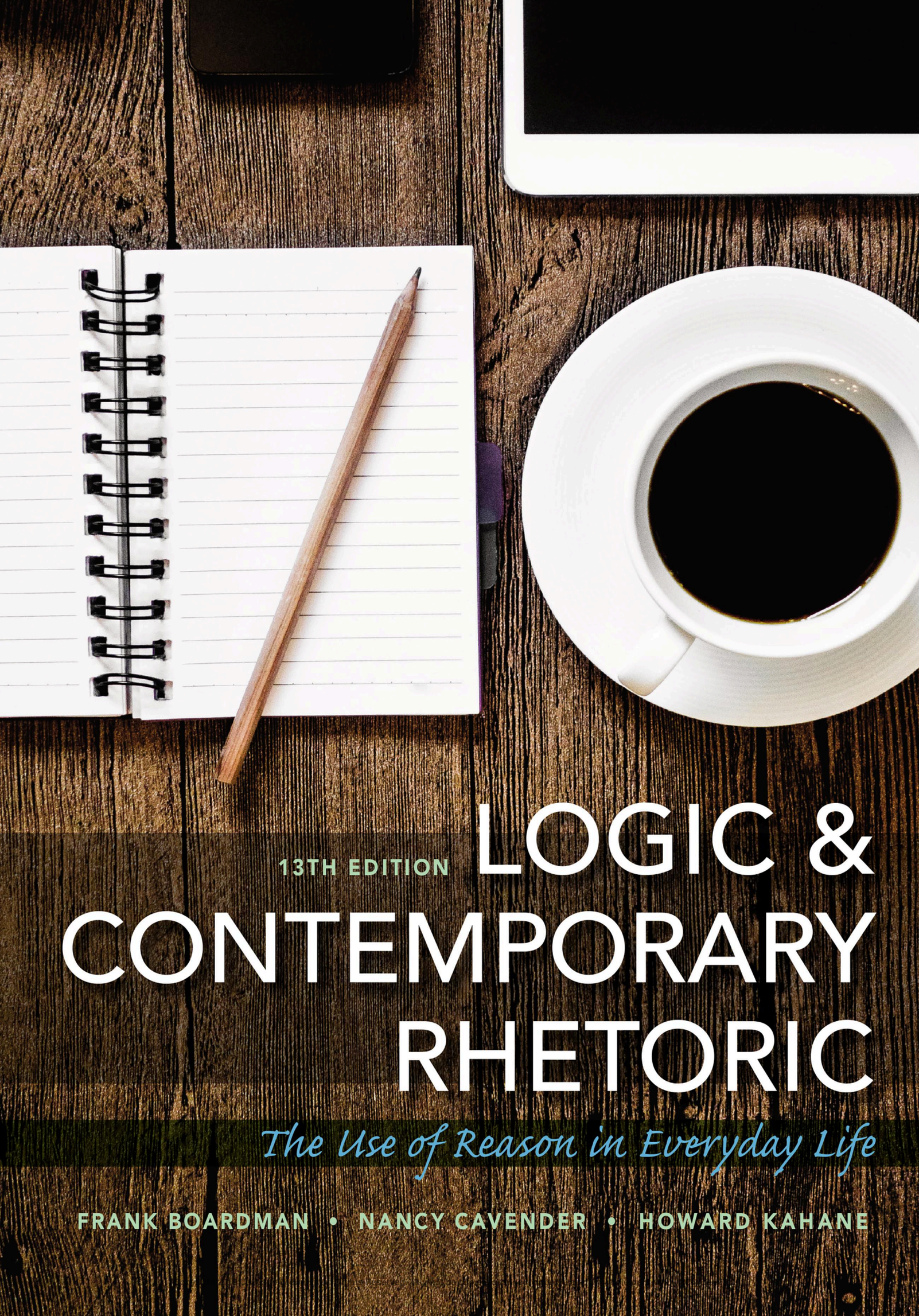

13TH EDITION

LOGIC & CONTEMPORARY RHETORIC

The Use of Reason in Everyday Life

FRANK BOARDMAN • NANCY CAVENDER • HOWARD KAHANE

Logic and Contemporary Rhetoric

The Use of Reason in Everyday Life

THIRTEENTH EDITION

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To Ellie, Lisa, and John

Contents

Preface

I do not pretend to know what many ignorant men are sure of.
—Clarence Darrow

To know that we know what we know, and that we do not know what we do not know. That is true knowledge. —Henry David Thoreau

We have met the enemy and he is us. —Walt Kelly's "Pogo"

Education is not simply the work of abstract verbalized knowledge.
—Aldous Huxley

Many people would sooner die than think. In fact, they do. —Bertrand Russell

You can fool too many of the people too much of the time.—James Thurber

Our loftiest ambition for the thirteenth edition of *Logic and Contemporary Rhetoric* is that it should encourage responsible and meaningful engagement in public discourse. *Responsible* engagement requires reason above all else, and so much of the text is devoted to introducing proper methods of identifying, analyzing, evaluating, and making arguments. *Meaningful* engagement requires an understanding of the actual state of rhetoric today, and so the text also focuses on some of the primary contexts of persuasion and argument in our daily lives.

The need is great and the moment is critical. We are faced with seemingly constant changes to the technology and norms of mass communication, just as social and political life is becoming more divided, more vitriolic, and less constrained by reason. We offer *Logic and Contemporary Rhetoric* as both a guide and an antidote to this condition.

The text contains examples and exercise items drawn from a broad range of sources—newspapers, websites, social media, film, television, advertisements, literature, political speeches, newspaper columns, and so on. Students get to sharpen their ability to think critically by reasoning about important topics and issues: Internet ethics, political trends, media biases, economic downturns, steroid abuse, and government doublespeak, to name just a few.

It quotes from or refers to writings and comments of Aristotle, Bertrand Russell, Barack Obama, Jerry Seinfeld, Ralph Ellison, Winston Churchill, Ann Coulter, Jane Austen,

Rush Limbaugh, Jonathan Swift, Fyodor Dostoevsky, Pliny the Elder, Donald Trump, William Shakespeare, Kwame Anthony Appiah, and a host of others. The text is sprinkled with relevant cartoons from the *New Yorker*, the Sunday papers, and the Internet. The trademarks of *Logic and Contemporary Rhetoric* always have been, and still are, ease of comprehension and up-to-date, interesting material. Textbooks need not be dull!

All this is done to sharpen students' abilities to think critically so that they can avoid being manipulated by the media, the advertisers, the political system, and a host of con artists—and ultimately to help them function independently and responsibly in our increasingly complex, challenging society.

The Instructor's Companion Site features an Instructor's Manual that provides useful suggestions for lectures and classroom activities, based directly on the content in this book. It also includes PowerPoint Lecture Slides offering a breakdown of the key points in each chapter. Interested instructors can find and access this content by adding the thirteenth edition of this book to their bookshelf on Cengage.com.

This edition is also accompanied by a digital solution for students and instructors: **MindTap for Philosophy: Logic and Contemporary Rhetoric,** a personalized, online digital learning platform providing students with an immersive learning experience that builds critical thinking skills. Through a carefully designed chapter-based learning path, MindTap allows students to easily identify the chapter's learning objectives; draw connections and improve writing skills by completing essay assignments; read short, manageable sections from the eBook; and test their content knowledge with critical thinking Aplia™ questions.

- **Chapter eBook:** Each chapter within MindTap contains the narrative of the chapter, offering an easy-to-navigate online reading experience.
- **Chapter Quiz:** Each chapter within MindTap ends with a summative Chapter Test covering the chapter's learning objectives and ensuring students are reading and understanding the material presented.
- **Chapter Aplia Assignment:** Each chapter includes an Aplia assignment that provides automatically graded critical thinking assignments with detailed, immediate feedback and explanations on every question. Students can also choose to see another set of related questions if they did not earn all available points in their first attempt and want more practice.
- **KnowNOW! Philosophy Blog:** The KnowNOW! Philosophy Blog connects course concepts with real-world events. Updated twice a week, the blog provides a succinct philosophical analysis of major news stories, along with multimedia and discussion-starter questions.

MindTap also includes a variety of other tools that support philosophy teaching and learning:

- The Philosophy Toolbox collects tutorials on using MindTap and researching and writing academic papers, including citation information and tools, that instructors can use to support students in the writing process.
- Questia allows professors and students to search a database of thousands of peer-reviewed journals, newspapers, magazines, and full-length books—all assets can be added to any relevant chapter in MindTap.
- ReadSpeaker reads the text out loud to students in a voice they can customize.
- Digital flashcards are premade for each chapter, and students can make their own by adding images, descriptions, and more.

MindTap gives students ample opportunities for improving comprehension and for self-evaluation to prepare for exams, while also providing faculty and students alike a clear way to measure and assess student progress. Faculty can use MindTap as a turnkey solution or customize by adding YouTube videos, RSS feeds, or their own documents directly within the eBook or within each chapter's Learning Path. MindTap goes well beyond an eBook and a homework solution. It is truly a personal learning experience that allows instructors to synchronize the reading with engaging assignments. To learn more, ask your Cengage Learning sales representative for more information, or go to www.cengage.com/mindtap.

New to the Thirteenth Edition

The principal changes in this edition are these:

1. Two entirely new chapters: one on changes to public discourse brought about by the emergence of cyberculture and new media (Chapter 12), and another on the argumentative and rhetorical function of fictional narratives (Chapter 13). The primary goal of both of these chapters (along with those on advertising and the news) is to capture and have students confront the contexts of argument and other modes of persuasion with which they are most familiar.
2. Ten new sections in existing chapters:
   - Arguments vs. Explanations (Chapter 1)
   - What Does "Winning an Argument" Mean? (Chapter 1)
   - Conditional Statements (Chapter 2)
   - Guilt by Association (Chapter 4)
   - Appeal to Tradition or Popularity (Chapter 4)
   - Appeal to Pity or Fear (Chapter 4)
   - Vagueness and Ambiguity (Chapter 7)
   - Some Subtle Issues (concerning language, Chapter 7)
   - Are Advertisements Arguments? Examples of Rhetoric? (Chapter 10)
   - Criteria for Theory Selection (Appendix)
3. Numerous new subsections, case studies, and expanded discussions throughout the text, including:
   - The "reproducibility crisis" in social psychology (Chapter 1)
   - High-profile cases of concocted and fabricated news stories (Chapter 3)
   - Domains where appeals to authority are never permissible (Chapter 3)
   - The significance of new evidence to appeals to ignorance (Chapter 4)
   - Criteria for determining an adequate sample size (Chapter 5)
   - The practical dangers of scapegoating, denial, and partisan mindsets (Chapter 6)
   - Cultural insensitivity versus politically correct overreaction regarding sports teams' names and mascots (Chapter 7)
   - Analyzing arguments with claims that serve as both premises and conclusions (Chapter 8)
   - Diagramming argument structure (Chapter 8)
   - The role of generalizations and rules in moral argumentation (Chapter 8)

- Overcoming the difficulty of starting essays (Chapter 9)
- Choosing claims that are neither too weak nor too strong (Chapter 9)
- The challenges and art of rewriting well (Chapter 9)
- Ads that create and exacerbate consumers' fears (Chapter 10)
- Ads that rely upon and promote stereotypes (Chapter 10)
- Push polls as advertisements (Chapter 10)
- The decline of both local and international news coverage (Chapter 11)
- The emergence of nonprofit newsrooms (Chapter 11)

4. Hundreds of new examples and exercises making the text more up to date and relevant to students, including updates to critical studies and stories featured in previous editions
5. Revisions to some parts of the text that maintain the overall mission, tone, and style of past editions
6. New cartoons chosen for both their wit and their relevance

Organization of the Text

The thought that sparked the original organization of material in *Logic and Contemporary Rhetoric* way back in 1969–1970 was that student reasoning about everyday topics could be improved by acquainting them with a few basic principles of good reasoning and, in particular, by enlightening them concerning common ways in which people are taken in by fallacious arguments and reasoning in everyday life. But a close examination of the ways in which reasoning, in fact, goes wrong in everyday life shows that it does so in a majority of cases, first, because of a lack of sufficient (or sufficiently accurate) background information; second, because of the psychological impediments (wishful thinking, rationalization, prejudice, superstition, provincialism, and so on) that stand in the way of cogent reasoning; and third, because of a poor understanding of the nature and quality of the various information sources.

Taking account of this insight has resulted in a book that divides into eight parts, as follows:

1. *Good and Bad Reasoning:* Chapter 1 introduces students to some basic ideas about good and bad reasoning, the importance of having good background beliefs, in particular of having well-pruned worldviews, as well as some very rudimentary remarks about deduction and induction and the three overarching fallacy categories employed in Chapters 3, 4, and 5.
2. *Deduction and Induction:* Chapter 2 contains more detailed material on deductive and inductive validity and invalidity.
3. *Fallacious Reasoning:* Chapters 3, 4, and 5 discuss fallacious reasoning, concentrating on how to avoid fallacies by becoming familiar with the types most frequently encountered in everyday life. The point is to help students increase their ability to spot fallacious reasoning by discussing the most common types of fallacious argument and by providing students with everyday life examples on which to practice.
4. *Impediments to Cogent Reasoning:* Chapter 6 discusses wishful thinking, rationalization, provincialism, denial, and so on, and how to overcome them. It explains the attraction and mistaken nature of belief in the paranormal and other pseudosciences. In some ways, this is the most important chapter in the

book, because these skewers of rational thought so severely infect the thinking of all of us. (Some instructors may argue that the topic is more appropriately taught in psychology classes, not in classes primarily concerned with critical reasoning. But the reality here is that many students do not take the relevant psychology classes and that those who do often are provided with a purely theoretical account divorced from the students' own reasoning in everyday life, not with a "how-to" discussion designed to help them overcome these obstacles to rational thought.)

5. *Language:* Chapter 7 discusses the ways in which language itself can be used to manipulate meaning, for instance, via doubletalk and long-winded locutions. (This chapter also contains a section, not common in critical-thinking texts, on the linguistic revolution that has tremendously reduced the use of sexist, racist, and other pejorative locutions in everyday discourse; and it also has a few things to say about the use of politically correct [PC] locutions.)
6. *Evaluating and Writing Cogent Essays:* Chapter 8 deals with the evaluation of extended argumentative passages—essays, editorials, political speeches, and so on. Chapter 9 addresses the writing of these kinds of argumentative passages. (Instructors are urged not to pass over Chapter 9 and urged to have students write *at least* two argumentative papers during the semester. Writing is very likely the best way in which we all can learn to sharpen our ability to reason well. Writing is indeed nature's way of letting us know how sloppy our thinking often is. But it also is the best way to learn how to sharpen our ability to think straight.)
7. *Important Sources of Information, Argument, and Rhetoric:* Chapter 10 discusses advertising (singling out political ads for special scrutiny); Chapter 11, the news media; Chapter 12, the Internet and new media; and Chapter 13, fiction.
8. *More on Cogent Reasoning:* The appendix provides additional material on deduction and induction; cause and effect; scientific method; theory selection; and so on.

Note also that a section at the back of the book provides answers to selected exercise items. It should be remembered, however, that most of the exercise items in this text are drawn from everyday life, where shades of gray outnumber blacks and whites. The answers provided thus constitute author responses rather than definitive pronouncements. Similar remarks apply to the answers to the exercise items provided in MindTap.

The Unique Nature of *Logic and Contemporary Rhetoric*

This book is unique among critical reasoning texts in bringing together all of these apparently diverse elements, in particular in stressing the importance of overcoming natural impediments to cogent reasoning; in bringing to bear good background information when dealing with everyday problems; and in so extensively discussing the most important information sources. In this complicated modern world, all of us are laypersons most of the time with respect to most topics; the ability to deal effectively with the

"expert" information available to us via the media, textbooks, the Internet, and periodicals—to separate wheat from chaff—thus is crucial to our ability to reason well about everyday problems, whether of a personal or of a social-political nature.

Although the text contains much discussion of theory, this is *not* a treatise on the theory of cogent and fallacious reasoning. Rather, it is designed to help students learn *how* to reason well and *how* to avoid fallacious reasoning. That is why so many examples and exercise items have been included—arranged so as to increase student sophistication as they progress through the book—and why exercises and examples have been drawn primarily from everyday life. Learning how to reason well and how to evaluate the rhetoric of others is a skill that, like most others, requires practice, in this case practice on the genuine article—actual examples drawn from everyday life.

This text provides students with a good deal more than the usual supply of exercise items, but perhaps the most important are those requiring them to do things on their own: find examples from the mass media, write letters to elected officials, do research on specified topics.

A true critical reasoning course, or textbook, is unthinkable in a closed or authoritarian society and antithetical to the indoctrination practiced in that kind of culture. The authors of this text take very seriously the admonition that eternal vigilance is the price of liberty. Citizens who think for themselves, rather than uncritically ingesting what their leaders and others with power tell them, are the absolutely necessary ingredient of a society that is to remain free.

Acknowledgments

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Finally, this being my first time working on this text, I'd like to take the liberty of switching to the first-person-*singular* and thank some people who made my own participation possible: Samantha Boardman, my wife and research guru; Alan Hausman, my friend and mentor; and Sarah Edmonds, Debra Matteson, and Andrea Wagner at Cengage, and Valarmathy Munuswamy at Lumina Datamatics. Most of all, though, I need to thank Nancy Cavender. This text is brimming with her (and Howard Kahane's) talent, passion, and hard work. Her help on this edition has also been invaluable. I can only hope that I have done some justice to her great generosity and trust.

Frank Boardman
Carlisle, Pennsylvania, and Brooklyn, New York

What is the use of philosophy, if all it does is enable you to talk . . . about some abstruse questions of logic, etc., and if it does not improve your thinking about the important questions of everyday life?

—Ludwig Wittgenstein

Chris Wildt/Cartoon Stock

"Great speech! But let's cut your carefully reasoned conclusion and insert an uplifting sports metaphor."

1 Good and Bad Reasoning

It's much easier to do and die than it is to reason why. —H. A. Studdert Kennedy

Read not to contradict and confute, nor to believe and take for granted . . . but to weigh and consider. —Francis Bacon

You can lead a man up to the university, but you can't make him think. —Finley Peter Dunne

You can lead me to college . . . but you can't make me think. —Sweatshirt update seen at Duke University

Ignorance of reality provides no protection from it. —Harold Gordon

Reason is logic, or reason is motive, or reason is a way of life. —John Le Carré

MindTap® **Visit MindTap for more readings and resources.**

There is much truth to the old saying that life is just one problem after another. That's why problem solving is one of life's major preoccupations. **Reasoning** is the essential ingredient in problem solving. When confronted with a problem, those of us who are rational reason from what we already know, or have good reason to believe, or can find out, to new beliefs useful in solving that problem. The trick, of course, is to reason well. This book is about good reasoning—about how to reason well in everyday life—whether dealing with personal problems or those of a social or political nature.

All of us like to think of ourselves as rational human beings, yet most of what we know is passed on to us by other people. We know, for instance, that the earth is round because we've been told it is, even though our intuition is that it is flat because we walk on flat surfaces every day. In fact, for centuries, nearly everyone believed it was flat until scientific evidence proved without question that it isn't. Much of what we think we know is based on beliefs, sometimes unsupported by accurate information, instilled in us from childhood on. And too often, beliefs collapse into gut reactions to all manner of issues—from gun

control to same-sex marriage to legalizing drugs. A gut reaction is not the same as a rational thought, however, nor is a belief, unless it has been examined for accuracy against conflicting ideas and evidence. Critical thinking, after all, requires information as well as the ability to reason well.

Fortunately, no one is an island. We all have available to us a great deal of knowledge others have gained through experience and good reasoning—accurate information and well-intended advice available to anyone who reaches out for it. Unfortunately, not all information is created equal. Charlatans and fools can speak as loudly as saints or geniuses. Self-interest often clouds the thinking of even the brightest individuals. The trick when evaluating the mountain of verbiage we all are exposed to is to separate the nourishing wheat from the expendable chaff. One way to become good at doing this is to think a bit about what makes reasoning good (cogent), as opposed to bad (fallacious).

1. Reasoning and Arguments

Here is a simple example of reasoning about the nature/nurture issue:

> Identical twins often have different IQ test scores. Yet these twins inherit exactly the same genes. So environment must play some part in determining a person's IQ.

Logicians call this kind of reasoning an **argument**. In this case, the argument consists of three statements:

1. Identical twins often have different IQ test scores.
2. Identical twins inherit the same genes.
So, **3.** environment must play some part in determining IQ.

The first two statements in this argument give reasons for accepting the third. In logic talk, they are said to be **premises** of the argument. And the third statement, which asserts the claim for which the premises offer support, is called the argument's **conclusion**.

In everyday life, few of us bother to label premises or conclusions. We usually don't even bother to distinguish one argument from another. But we do sometimes give clues called **logical indicators**. Words such as *because, since,* and *for* usually indicate that what follows is a premise of an argument. *Therefore, thus, consequently,* and *so* generally signal conclusions. Similarly, expressions such as "It has been observed that . . . ," "In support of this . . . ," and "The relevant data are . . ." are used to introduce premises, while expressions such as "The point of all of this is . . . ," "The implication is . . . ," and "It follows that . . ." are used to signal conclusions. Here is a simple example:

> *Since* it's always wrong to kill a human being [premise], it *follows* that capital punishment is wrong [conclusion], *because* capital punishment takes the life of [kills] a human being [premise].

Put into textbook form, the argument looks like this:

1. It's always wrong to kill a human being.
2. Capital punishment takes the life of (kills) a human being.
∴**3.** Capital punishment is wrong.[1]

In this form, we display only the premises and conclusion of the argument. We leave out logical indicators since the logical structure of the argument is shown by the way we arrange the sentences. Of course, an argument may have any number of premises and may be surrounded by or embedded in other arguments or extraneous material.

In addition to using logical indicators such as *since, because,* and *therefore,* we sometimes employ sentence order—the last sentence in a series stating an argument's conclusion—and occasionally even express a conclusion in the form of a question. Consider this section of President Obama's 2016 State of the Union address:

> Our unique strengths as a nation—our optimism and work ethic, our spirit of discovery, our diversity, our commitment to rule of law—these things give us everything we need to ensure prosperity and security for generations to come.
>
> In fact, it's that spirit that made the progress of these past 7 years possible. It's how we recovered from the worst economic crisis in generations. It's how we reformed our health care system, and reinvented our energy sector; how we delivered more care and benefits to our troops and veterans; and how we secured the freedom in every state to marry the person we love.
>
> But such progress is not inevitable. It's the result of choices we make together. And we face such choices right now. Will we respond to the changes of our time with fear, turning inward as a nation, turning against each other as a people? Or will we face the future with confidence in who we are, in what we stand for, in the incredible things that we can do together?

The rhetorical questions at the end invite us to respond that we should face the future with confidence instead of fear. In the preceding paragraphs, Obama gave reasons for this conclusion (and, of course, touted his administration's accomplishments while he was at it).

We should also note that, in daily life, premises and even the conclusions of arguments sometimes are implied rather than stated outright. Life is short, and we don't always bother to spell out matters that are obvious or not at issue or can be taken for granted. In the IQ example given earlier, for instance, the premise that IQ differences must be due either to genetic or to environmental factors was omitted as generally understood. When assessing arguments, we should by all means add unstated premises of this kind when they are relevant.

Sometimes people leave conclusions unstated as a kind of rhetorical device. We often feel more committed to beliefs we come to on our own, and leaving conclusions unstated can give us the impression that we've done just that. In a debate in Wisconsin during the 2016 presidential primary campaign season, Hillary Clinton had this to say about her opponent Bernie Sanders's plan for funding higher education:

> You know, I think, again, both of us share the goal of trying to make college affordable for all young Americans. And I have set forth a compact that would do just that for debt-free tuition.

[1]The symbol ∴ often is used as shorthand for the word *therefore* and thus indicates that a conclusion follows.

> We differ, however, on a couple of key points. One of them being that if you don't have some agreement within the system from states and from families and from students, it's hard to get to where we need to go.
>
> And Senator Sanders's plan really rests on making sure that governors like Scott Walker contribute $23 billion on the first day to make college free. I am a little skeptical about your governor actually caring enough about higher education to make any kind of commitment like that.

The unstated conclusion here is that Sanders's plan is impractical and unlikely to succeed. It was probably neither by accident nor mistake that Clinton left this out.

2. Exposition and Argument

Of course, only those groups of statements that provide reasons for believing something form arguments. Thus, anecdotes are not usually arguments, nor are most other forms of **exposition**. But even in these cases, arguments often are implied. Here is a sales clerk talking about the difference between the cameras on two phones, a Samsung and a Motorola. "Well, the Motorola has 21 megapixels and the Samsung has only 16. They both have terrific image quality, but the Samsung has optical stabilization. The Motorola right now is $150 less, but it has fewer features." Although the clerk's remarks contain no explicit argument because no conclusion is stated, a conclusion is definitely implied. You should choose the Samsung if you want more camera features; otherwise you should choose the Motorola.

The point is that talk generally is not aimless. A good deal of everyday talk, even gossip, is intended to influence the beliefs and actions of others and thus constitutes a kind of argument. In the phone example, the clerk provided information intended to convince the customer to draw either the conclusion, "I'll buy the Samsung because the additional features are worth the extra $150 to me," or the conclusion, "I'll buy the Motorola because high-powered options aren't worth $150 more to me." In other words, the point of the clerk's chatter was to sell a phone. Similarly, advertisements often just provide product information rather than advance explicit arguments, yet clearly every such ad has an implied conclusion—that you should buy the advertised product.

Nevertheless, it is important to understand the difference between rhetoric that is primarily expository and discourse that is basically argumentative. An argument makes the claim, explicit or implicit, that one of its statements follows from some of its other statements. It at least implies that acceptance of its conclusion is justified if one accepts its premises. A passage that is purely expository gives us no reason to accept any "facts" it may contain (other than the implied authority of the writer or speaker, as, for example, when a friend tells us that she had a good time at the beach).

3. Arguments vs. Explanations

One form of exposition that is especially likely to be confused for argument is the explanation. Explanations are often structured much like arguments and even use some of the same words to introduce them ("because," "since," etc.). But explanations are not

arguments. Arguments are used to persuade an audience that some claim is true. Explanations are used to provide an audience with greater understanding about a given claim. When we explain something, we take its truth for granted. That is to say, arguments give us *reasons to believe* something, while explanations give us *the reasons why* something is (or has come to be) the case. To put it another way, explanations answer the question "Why is that claim true?" while arguments answer the question "Why should I believe that claim is true?"

For instance, have a look at this passage from Matthew T. Hall of the *San Diego Tribune* on the fact that the first presidential primary election is always held in New Hampshire:

> I've seen firsthand why New Hampshire should be first in line. Sure, the state isn't as diverse as it could be and its winners don't always get their party's nomination, but the state's complexion is going to change with the country's and its voters have shown the door to unfit candidates. Retail politics has real value there, and unsurprisingly for a state whose motto is "Live Free or Die," it has a huge share of independent voters. Put simply, I think they value their first-in-the-nation primary status in ways people in states getting the distinction every so often would not.

And then this from Mentalfloss.com: "New Hampshire's primaries have informally been the earliest since 1920, but over the years, the state has passed laws to ensure that its primaries will remain the first in the nation."

The first quote above is part of an attempt to persuade us that New Hampshire should hold the first primary. The second is an attempt to say why New Hampshire is first. The first one is an argument, the second an explanation.

Like just about any other form of exposition, explanations can be used to make implicit arguments. Still, the distinction between arguments and explanations is important to maintain as they call for different kinds of evaluation. (Did we just argue for or explain the claim that maintaining a distinction between arguments and explanations is important?)

4. What Does "Winning an Argument" Mean?

When we talk about an *argument* in this context, we clearly do not mean anything like a fight, and our sense of "argument" does not even imply any disagreement. So it is not clear that it is proper to ask what it means to "win" arguments as we understand them. That said, we are interested in the ways that arguments are actually used (hence the "and Contemporary Rhetoric" part of the title) and so we should take a moment to think about what it means for an argument to be successful.

From a strictly logical perspective, the only criterion for a successful argument is the quality of the argument itself, and we will turn in the next few sections to some ways of evaluating arguments in this respect. But an argument can be logically sound and still not very persuasive. That is to say, just because an argument *should* be convincing does not mean that it will be.

At the same time, we should not count as successful an argument that is persuasive but illogical. A truly "winning" argument is one that is *in fact* persuasive because it is rational to accept its conclusion on the basis of its premises. As we'll see throughout this text, the combination of logical integrity and rhetorical effect may be all too rare an accomplishment.

5. Cogent Reasoning

Our chief concern to this point has been the *identification* of arguments. We can now turn our focus to their *evaluation*. Reasoning can be either **cogent** (good) or **fallacious** (bad). We reason cogently when we satisfy the following conditions:

1. The premises of our reasoning are believable (**warranted**, justified), given what we already know or believe.
2. We consider all likely relevant information.[2]
3. Our reasoning is **valid**, or **correct**, which means that the premises we employ provide good grounds for accepting the conclusion we draw.[3]

When any of these three conditions of cogent reasoning are not satisfied, reasoning is said to be *fallacious*.

BELIEVABLE PREMISES

The first condition of good argument evaluation requires that we bring to bear whatever we already know or believe—our relevant **background beliefs** and information—to determine whether we should or shouldn't accept the premises of the argument in question. Take, for instance, the first premise of the capital punishment argument discussed earlier—the premise making the claim that taking the life of a human being always is wrong. Most of us are not pacifists—we don't believe that it always is wrong to take a human life. Bringing that background belief to bear thus should make us see the first premise of the capital punishment argument as questionable. So we should not accept the conclusion of that argument unless further reasons are presented in its support. (On the other hand, those of us who *are* pacifists obviously should reason differently.)

By way of contrast, consider the stated premise of the following argument:

> Novak Djokovic must be a terrific tennis player. He won the Wimbledon championship in 2015. (The implied premise is that anyone who wins the tournament at Wimbledon must be a terrific tennis player.)

[2]Satisfying this extremely stringent requirement is usually beyond the ability of most of us most of the time. The point is that good reasoners try to come as close as possible to satisfying it, taking into account the importance of drawing the right conclusion and the cost (in time, effort, or money) of obtaining or recalling relevant information. (One of the marks of genius is the ability to recognize that information is relevant when the rest of us fail to notice.)

[3]Provided we know nothing else relevant to the conclusion. Note that reasoning from an unjustified premise may still be cogent if it also employs justified premises that sufficiently support its conclusion. Note also that the term *valid* sometimes is used more broadly than we have used it here.

Tennis fans know that the Wimbledon Grand Slam championship is one of the most demanding tennis competitions in the world, and acceptance of the stated premise (that Djokovic won the tournament) is warranted by plenty of background information.

It's interesting to notice that, in effect, evaluating a premise of an argument by bringing background beliefs to bear entails constructing another argument whose conclusion is either that the premise in question is believable or that it isn't. For example, when evaluating the capital punishment argument discussed before, someone who is not a pacifist might construct the following argument: "I believe that it isn't wrong to kill in self-defense, or in wartime, or to kill those guilty of murder. So I should reject the premise that taking a human life always is wrong."

But what, you might be asking, about your own premise, that "it isn't wrong to kill in self-defense or in wartime, or to kill those guilty of murder"? Shouldn't that be subject to evaluation as well? This is a difficult question. We certainly should subject our own beliefs to scrutiny. But at the same time, if we evaluated every premise using another argument, including those premises used in the evaluating arguments, this process would never end! We will consider the use of background beliefs in greater detail later in this chapter. For now, let's just say that this process of evaluation should end in premises that are as self-evident as possible.

This brings to mind the fact that in daily life we often are exposed to assertions, or claims, that are not supported by reasons or arguments. Clearly, it is not rational to accept these assertions without evaluating them for believability, and, obviously, their correct evaluation requires us to do exactly what we do when evaluating the believability of the premises of an argument—namely, bring to bear what we already know or believe. Evaluating unsupported assertions thus involves just part of what is done when we evaluate arguments.

NO RELEVANT INFORMATION PASSED OVER

The second criterion of cogent reasoning requires that we not pass over relevant information. In particular, it tells us to resist the temptation to neglect evidence contrary to what we want to believe.

Here, for instance, is a part of a column written in December 2015 by David Brooks in the *New York Times* in which he predicted a precipitous decline in Donald Trump's support heading into the primary voting season:

> When campaigns enter that final month, voters tend to gravitate toward the person who seems most orderly. As the primary season advances, voters' tolerance for risk declines. They focus on the potential downsides of each contender and wonder, could this person make things even worse?
>
> When this mental shift happens, I suspect Trump will slide. All the traits that seem charming will suddenly seem risky. The voters' hopes for transformation will give way to a fear of chaos. When the polls shift from registered voters to likely voters, cautious party loyalists will make up a greater share of those counted.

> The voting booth focuses the mind. The experience is no longer about self-expression and feeling good in the moment. It's about the finger on the nuclear trigger for the next 4 years. In an era of high anxiety, I doubt Republican voters will take a flyer on their party's future—or their country's future.

We can summarize Brooks' argument this way:

1. People are less likely to actually vote for risky candidates than they are to endorse them early in polls.
2. Voters who are more risk-averse are more likely to vote.
3. Trump is a risky candidate. (Implied)
∴**4.** Trump will not do as well in actual elections as he has in early polling and will do less well in polls that focus on likely voters.

Trump then won 14 of the first 20 primary contests. Brooks was hardly alone in underestimating Trump's campaign, but his argument seemed particularly strong. He looked to historical elections and likely voting behavior and came to a reasonable conjecture based on those things.

However, two factors worked against Brooks. First and foremost, he did not consider relevant information about the electorate, especially the high level of frustration Republican voters felt about their party's leadership and "cautious party loyalists." Second, Brooks may have been swayed by a bit of wishful thinking. As a moderate Republican and a (at least by *New York Times* standards) conservative, Brooks was very concerned about what a Trump nomination would mean for his party and country.

VALID REASONING

The third criterion of cogent reasoning requires that the premises of an argument genuinely support its conclusion; or, as logicians like to say, it requires that an argument be valid, or correct. It is vitally important to understand that the validity of an argument has nothing whatever to do with the truth of its premises or conclusion. Validity concerns the nature of the *connection* between the premises and conclusion of an argument, not the truth or believability of its premises. Determining that an argument is valid tells us that *if* we are justified in believing in its premises, *then* we also are justified in believing in the truth of its conclusion. It doesn't tell us *whether* its premises are true. An argument thus can be perfectly valid and have completely false premises, and even have a false conclusion. Here is an example:

1. The New York Mets have won more World Series games than any other major league team. (False premise, alas!)
∴**2.** They have won more World Series games than the New York Yankees. (False conclusion, and even more heartbreaking for Mets fans.)

The argument is valid because if the Mets *had* won more World Series games than any other major league team, then, obviously (well, it's obvious to baseball fans), they would have won more World Series games than the Yankees. The argument is valid, even though its premise and conclusion both are false. It's valid because anyone who is justified in believing its premise is justified in believing its conclusion.

6. Two Basic Kinds of Valid Arguments

Premises may correctly support conclusions in two fundamentally different ways. The first way yields *deductively valid* arguments; the second, *inductively valid* (or inductively strong) arguments.[4]

DEDUCTIVE VALIDITY

The fundamental property of a **deductively valid** argument is this: If all of its premises are true, then its conclusion must be true also, because the claim asserted by its conclusion already has been stated in its premises, although usually only implicitly.

Here is an example of a very simple deductively valid argument:

1. If this wire is made of copper, then it will conduct electricity. (Premise.)
2. This wire is made of copper. (Premise.)
∴**3.** This wire will conduct electricity. (Conclusion.)

Taken alone, neither premise makes the claim that the wire will conduct electricity; but taken together, they do. We cannot imagine what it would be like for both premises of this argument to be true, yet its conclusion turns out to be false. Indeed, it would be contradictory to assert both of its premises and then to deny its conclusion.

It is important to see that it is the **form** of this argument—namely:

1. If some sentence, then a second sentence.
2. The first sentence.
∴**3.** The second sentence—

that makes it deductively valid, not the truth values of its statements. Letting the capital letter *A* stand for the first sentence and *B* for the second sentence, the *form* of the argument can be stated this way:

1. If *A,* then *B.*
2. *A.*
∴**3.** *B.*

Clearly, every argument having this form is deductively valid, another example being this argument:

1. If Sonia reads *Vogue* magazine, then she's up on the latest fashions.
2. Sonia reads *Vogue* magazine.
∴**3.** She's up on the latest fashions.

[4]Some authorities believe that there is at least one other kind of legitimate argument—namely, the kind in which various alternatives are evaluated. The authors of this text incline to the view that evaluative arguments fall into one or the other of the two basic kinds about to be mentioned. Note also that some authorities restrict the use of the term *valid* so that it refers only to deductively good arguments, even though in everyday life, inductively strong arguments generally are said to be valid. In addition, note that the reasoning process called "mathematical induction" happens to be a kind of deductive reasoning. (Terminology sometimes is misleading.)

Logicians, by the way, call the form of this argument, and every argument having this form, ***modus ponens***. (We will consider *modus ponens* again in the next chapter, along with other valid argument forms.)

It's very important to understand that the deductive validity of an argument guarantees that its conclusion is true *only if* its premises are true. Determining that an argument is deductively valid thus tells us just that *if* its premises are true, *then* its conclusion must be true also; it doesn't tell us *whether* its premises are true and thus doesn't tell us *whether* its conclusion is true.

Here, for instance, is a deductively valid argument having the form *modus ponens* that contains one true and one very likely false premise, and thus does not guarantee the truth of its conclusion:

1. If more people read Agatha Christie's mystery novels than read Shakespeare's plays, then her novels must be better than his plays. (False premise?)
2. Her novels have been read by more people than have Shakespeare's plays. (True premise.)
∴**3.** Her novels must be better than his plays. (False conclusion?)

Of course, a deductively valid argument that contains a false premise may have a true conclusion. But that would be a matter of luck, not of good reasoning.

Deductively valid arguments, then, can have false premises and a false conclusion, false premises and a true conclusion, or true premises and a true conclusion. The only combination that a deductively valid argument cannot have is all true premises and a false conclusion.

The fact that a deductively valid argument cannot move from true premises to a false conclusion constitutes its chief characteristic and great virtue. When you present someone with a deductively valid argument that has premises they know to be true, they must—on pain of irrationality—accept your conclusion! But deductive arguments are limited. They cannot yield conclusions that are not at least implicit in the premises from which they are derived. **Induction** is needed to perform this task.

INDUCTIVE VALIDITY

Inductively valid (inductively strong) arguments, unlike deductively valid ones, have conclusions that go beyond what is contained in their premises. The idea behind valid induction is that of *learning from experience.* We often observe patterns, resemblances, and other kinds of regularities in our experiences, some quite simple (sugar sweetening coffee), some very complicated (objects moving according to Newton's laws—well, Newton noticed this, anyway). Valid inductions simply project regularities of this kind observed in our experiences so far onto other possible experiences.[5]

Here is a simple example of an inductively valid argument, of the kind sometimes called *induction by enumeration,* expressed by a rather smart child in Jacksonville, Florida, explaining why he is doubtful about the existence of Santa Claus:

> The tooth fairy turned out not to be real. The Easter Bunny turned out not to be real. So I'm beginning to wonder about Santa.

Admittedly this is a small sample, but perhaps not for a 4-year-old with a limited range of experience.

[5]This includes those experiences we can't have but might have if we had lived millions of years ago, or if, say, we could go into the interior of the sun without being incinerated.

We use inductive reasoning so frequently in everyday life that its nature generally goes unnoticed. Being informed about induction is a bit like being told that we've been speaking prose all our lives. We start drawing perfectly good inferences of this kind (and some klinkers) at a very early age. By age 5 or 6, the use of induction has taught us a great many of the basic truths that guide everyday behavior—for instance, that some foods taste good and some don't, the sun rises every morning and sets every evening, very hot things burn the skin, some people are trustworthy and some aren't (something most of us seem to need to relearn over and over), and so on.

The great virtue of inductive reasoning is that it provides us with a way of reasoning to genuinely new beliefs, not just to psychologically new ones that are implicit in what we already know, as in the case of valid deductions. However, this benefit is purchased at the cost of an increase in the possibility of error. As remarked before, the truth of the premises of a deductively valid argument guarantees the truth of its conclusion; but the premises of a perfectly good induction may all be true and yet its conclusion false. Even the best "inductive leap" may lead us astray, because the patterns noticed in our experiences up to a given point may not turn out to be the exact patterns of the whole universe. This happens all too often in daily life—for example, when a restaurant that has served excellent food many times in the past fails us on a special occasion. But it sometimes happens even in the lofty realm of physics. Scientists, for instance, believed for a long time—based on strong inductive reasoning—that particles could not be colder than absolute zero, but then researchers discovered that atoms could be cooled to negative absolute temperatures in a vacuum.

Nevertheless, rational people use induction in formulating their ideas about how things are going to turn out, whether in ordinary, everyday circumstances or in the rather special ones scientists bring about in the laboratory. Induction, thinking of Winston Churchill's famous remark about democracy, is the worst way to expand one's knowledge except for all of the other ways (guessing, wishful thinking, astrology, etc.).

7. Some Wrong Ideas About Cogent Reasoning

Having just presented three standards of cogent reasoning and having explained the nature of valid deduction and induction, perhaps we need to mention several recently voiced ideas about logic and good reasoning. According to these modestly trendy ways of looking at the topic, what counts as good reasoning is "culturally relative," or "gender-relative," or even "individually relative." We hear talk of "feminine logic," supposedly different from the "male logic" of logic classes (which has been developed, advanced, and taught by female logicians, but let that pass), and of "black intelligence," different from the "Eurocentric" variety foisted on us by white males, as though what makes reasoning good differs from group to group, from race to race, or from one sex to the other. We all too often hear students say things such as "That may well be true for you, but it isn't true for me," and listen to academics talk disparagingly of "Aristotelian linear reasoning," as opposed to a more "intuitive" type of reasoning, and so on.

> A wise person hears one word and understands two.
>
> —JEWISH PROVERB

Reading Between the Lines

The expression "reading between the lines" has several meanings. One captures the idea of grasping an intended thought that is not expressed, another of getting more information from a statement or argument than it explicitly—or even implicitly—contains, still another of noticing what rhetoric either deliberately or accidentally hides. Reading between the lines often is the essential ingredient in assessing a good deal of the everyday talk we all encounter, in particular political rhetoric and (interestingly) advertisements.

Take the Bufferin ad that states, "No regular aspirin product reduces fever better." Reading between the lines of this ad, we should conclude that Bufferin does *not* reduce fever better than some competing products, because if it did, the ad would make that stronger claim ("Bufferin reduces fever better than any other aspirin product") rather than the weaker one that none reduces fever better. The point is that our own background beliefs should lead us to expect an advertisement to make the strongest claim possible and thus lead us to at least tentatively conclude that a less strong claim is made because stronger claims would be false.

Reading between the lines is the linguistic equivalent of "sizing up" other people—for example, of gleaning information about their beliefs or likely actions from their overt behavior or way of saying something. A good poker player, for instance, looks for signs of bluffing—some players often unwittingly signal a bluff by increasing chatter or by nervous behavior; others do so by feigning lack of concern. Similarly, intelligent voters try to size up political candidates by looking for nonverbal clues and by reading between the lines of campaign rhetoric. (More will be said about campaign rhetoric in Chapters 7 and 10.)

But there is no truth to these ideas about what constitutes good reasoning. It is the height of folly to conclude, say, that an argument having the form *modus ponens* is not valid. Think, for example, what it means to assert seriously that all human beings have a right to life, and then in the next breath to claim, equally seriously, that a particular human being, Smith, has no right to life. What sense is there in first saying that if Jones has been to China, then he's been to Asia, and then asserting that he has indeed been to China but not to Asia? Yet accepting reasonings that violate the standards of deductive logic means precisely accepting some sorts of contradictory assertions or other, because the point of the principles of valid deduction (including the valid principles of mathematics) is to assure that we do not contradict ourselves when we reason from one thing to another. (That's why, to take just one of a thousand examples, double-entry bookkeeping works.)

Similarly, what reason could there be for violating the standards of good inductive reasoning—for denying what experience teaches us? That a large majority of the scientists who laid the groundwork in physics, chemistry, and biology were white males is totally irrelevant to the truth of their basic ideas and theories. *The way the world works does not differ depending on the race or sex of those trying to discover the way the world works!* That is why, to take an everyday example, it is foolish to toss away money on homeopathic medicines: Medical science has shown, over and over again, by

means of inductive reasoning, to say nothing of very highly confirmed general biological principles, that homeopathy does not work. The point cannot be stressed too heavily. There simply is no truth whatsoever to the idea that standards of good reasoning differ from group to group, male to female, or person to person.

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There is, however, a good deal of truth to three much different ideas. One is that self-interest, prejudice, and/or narrow-mindedness do in fact often lead people to reason invalidly. Bigotry has a bad name for good reason. Another is that self-interest often motivates us to neglect the values or interests of others, even when we share those values, so that some groups or individuals find their interests frequently neglected. For instance, rich people who believe fairness requires that everyone ought to have an equal chance when starting out in life often forget about equality of opportunity when they argue for the elimination of all inheritance taxes; in families in which both parents work, husbands notoriously tend to paper over their failure to share household and child-rearing duties; in the business world, high executives, while asserting their belief in equal rights for all, frequently overlook the ways in which women, Latinos, and blacks are often passed over for corporate advancement. In all of these cases, the problem is not with the principles of good reasoning. It is with the fallacious nature of the ways in which these principles sometimes are employed.

Those who champion other sorts of "logics" than the standard variety thus may well be mistaken in their target. They attack the principles of good reasoning rather than the failure of their opponents to employ these perfectly good (indeed the *only* good) standards of reasoning correctly, or to reason from acceptable moral or other kinds of values.

A good deal more will be said in later chapters on these matters, in particular about moral and other value claims. For now, the point is just that we must distinguish the principles of good reasoning, which are the same for all, from the ways in which these principles are employed (sometimes fallaciously), and from the differing values that enter into the premises of different reasonings.

8. Background Beliefs

Earlier, we characterized cogent reasoning in terms of three conditions: the validity of connections between premises and conclusions, the believability of premises, and the discovery and use of relevant information. Clearly, satisfaction of the last two of these

three conditions requires the employment of background beliefs. That is why bringing one's background beliefs to bear is among the most important tasks in evaluating an argument for cogency.

Consider, for example, the argument frequently heard in the early 1980s that AIDS was essentially a gay plague inflicted on homosexuals as punishment for their perverse sexual conduct (a claim still occasionally heard). Setting aside illegitimate assumptions about diseases being punishments and the "perversion" of homosexuality, the key premise of this argument was that AIDS can be transmitted sexually only via homosexual conduct. This was supported by the evidence that in the United States, a large majority of those reported early on to have the disease were indeed homosexuals. But people with good background information did not accept this argument. For one thing, they knew that in other places around the world—for instance, in Haiti and parts of Africa—large numbers of heterosexuals also had contracted AIDS via sexual contact. And for another, those familiar with some of the basic scientific ideas concerning disease had theoretical (which means higher-level inductive) reasons for believing that AIDS could be transmitted via heterosexual behavior, as are syphilis, hepatitis B, herpes, and so on.

Today, most Americans know that AIDS is transmitted by both heterosexuals and homosexuals, but many people wrongly think that the disease is curable because they have heard about drugs used to treat HIV. In fact, these drugs suppress the viral infection but do not cure it, and no vaccine has been successfully developed to date. Unfortunately, many young people believe they can be cured if they become infected and thus fail to take adequate precautions.

The point is that, contrary to the old saying, ignorance is *not* bliss. It just renders us incapable of intelligently evaluating claims, premises, arguments, and other sorts of rhetoric we all are subject to every day. When evaluating arguments and issues, we can't bring relevant beliefs to bear if we don't have them, and we cannot make good judgments if what we believe is off the mark.

9. Kinds of Background Beliefs

Background beliefs can be divided up in many different ways, an important one being a separation into beliefs about *matters of fact* and beliefs about values. It is a factual question, for example, whether capital punishment is practiced in every society (it isn't); it is a question of values whether capital punishment is morally justified (is it?). In dealing with most social or political issues, we need to separate claims that are about matters of fact from those concerning values, because these two different sorts of claims are defended, or justified, in different ways. The statement, for example, that a given state has a death penalty is proved true, or false, by an examination of relevant government records; the judgment that capital punishment is, or isn't, morally justified as the punishment for heinous crimes is determined by bringing to bear an accepted moral code, or subjective intuitions.[6]

[6]Philosophers and others disagree seriously concerning the question whether there are such things as objective moral principles that all clear-minded, rational individuals are bound to see as correct, or whether moral right and wrong is a matter of subjective opinion—of feelings that can, and perhaps do, differ from person to person.

> Knowledge not renewed quickly becomes ignorance.
>
> —PETER DRUCKER

> Those who cannot remember the past are condemned to repeat it.
>
> —GEORGE SANTAYANA

Background beliefs also can be divided into those that are *true* and (unfortunately) those that are *false.* Someone who believes, for example, that capital punishment exists as a practice in every society has a false belief; those who believe that every society punishes murderers in one way or another has a belief that is true. An important reason for regularly testing our background beliefs in terms of our experiences and of what we learn from others is precisely to weed out background beliefs that are false. Education consists of a lot more than simply learning a mountain of facts; it also has to do with weeding out beliefs that turn out to be false (or unjustified).

Beliefs also differ as to how firmly they are or should be held. We feel completely sure, completely confident, of some beliefs (for example, that the sun will rise tomorrow); less sure, but still quite confident, of others (for example, that the United States will still be in existence in the year 2050); and a good deal less sure, but still mildly confident, of others (for example, that we won't get killed someday in an auto accident). The trick is to believe firmly what should be believed, given the evidence, and believe less firmly, or not at all, what is less well supported by evidence.

All of this relates directly to decisions we have to make in everyday life. Wise individuals take into account the probability of one thing or another happening and thus of the confidence they should place in their beliefs about what to do. That's a large part of the truth behind familiar sayings such as "A bird in the hand is worth two in the bush."

10. Worldviews or Philosophies

As we grow up from childhood into adults, we tend to absorb the beliefs and standards of those in the world around us—our families, friends, and culture. It is no accident that so many of us have the same religious affiliation, or lack of same, as do our parents, that we accept the principles and standards of our own society, and so on.

These beliefs constitute an important part of our **worldviews** or **philosophies**.[7] They tend to be the most deeply ingrained and most resistant to amendment of all of our background beliefs. They become so much a part of us that we often appeal to them without consciously realizing we have done so. They are so thoroughly woven into the fabric of our belief systems that we often find it hard to isolate and examine individual strands. And when we do examine them, our natural tendency is to reaffirm them without

[7]This includes religious beliefs in the case of those who have religious convictions.

thought and to disparage conflicting claims and evidence, quickly dismissing evidence that might count against them.

Most of these beliefs are general—for example, that killing always is morally wrong, that there is some good in virtually all human beings, or that we all die sooner or later. But not all are. Belief in a monotheistic deity, for instance, or rejection of such a belief, is a particular belief.

But in spite of the example just cited, general beliefs usually are more important than beliefs that are particular, or less general, because they tell us about a wider range of cases and thus tend to be more useful in everyday life. Believing that it rarely rains in July in Los Angeles, for instance, clearly is more useful than believing merely that it won't rain there, say, on July 16, 2024. That is why most of the important beliefs in one's worldview are general and also why most important scientific pronouncements are general—indeed, often extremely general. (Newton's laws, for example, don't just tell us about apples falling from trees or even just about items of all kinds falling toward Earth. They also tell us about the motion of Earth around the sun, about the motion of all planets around the sun, about how tides rise and fall, and, in fact, about the motions of all objects whatsoever.) It also is why it is so important, and useful, to expand our worldviews to contain at least a few modestly well-founded beliefs about important scientific theories—for example, about the theory of the evolution of all life on Earth.

Our Words and Worldviews

*The worldviews of political parties are implied in the words and phrases they use repeatedly in their discourse. University of California linguist George Lakoff came up with a list of words used over and over in the speeches and writings of conservatives and liberals. It's worth examining them to figure out the dominant worldviews reflected in the language.**

Conservatives: character, virtue, discipline, tough it out, get tough, tough love, strong, self-reliance, individual responsibility, backbone, standards, authority, heritage, competition, earn, hard work, enterprise, property rights, reward, freedom, intrusion, interference, meddling, punishment, human nature, traditional, common sense, dependency, self-indulgent, elite, quotas, breakdown, corrupt, decay, rot, degenerate, deviant, lifestyle.

Liberals: social forces, social responsibility, free expression, human rights, equal rights, concern, care, help, health, safety, nutrition, basic human dignity, oppression, diversity, deprivation, alienation, big corporations, corporate welfare, ecology, ecosystem, biodiversity, pollution.

What worldviews are indicated by the repetition of these words? Reflect a moment on the assumptions you used to come to these conclusions. Specifically, which of the words above do you think were typically used with a negative connotation?

*Taken from Lakoff, G. *Moral Politics: How Liberals and Conservatives Think*. Chicago: University of Chicago Press, 2002.

Compare the worldview reflected in this gem, excerpted from a 1950s women's magazine, to your worldview.

From "Runaway Husbands" by Barbara Heggie

Somehow, in her battle for equal rights, the American woman has convinced herself that one of these rights is the love of her husband. She should be reminded that love is not an obligation, but a reward for favors received—for affection, for solicitude, above all for making her husband feel he is the center of her own particular universe. What I had seen in the bleak faces of the deserted wives I had talked to was the knowledge they had failed in the biggest job a woman can accept.

—*GOOD HOUSEKEEPING*, OCTOBER, 1950

11. Insufficiently Grounded Beliefs

Most of us have strongly held beliefs about a great many controversial issues, and so we tend to respond automatically to arguments about these matters. We feel confident that we know whether marijuana should be legalized, whether we should privatize Social Security, whether this candidate or that is more likely to serve all of the people equally if elected to office, and so on. We hold these beliefs, often very strongly, even though a good deal of the time we have insufficient justifying background knowledge and have engaged in too little thought to be able to support our beliefs intelligently or defend them against informed objections. What, for example, do we usually know about candidates running for seats in the U.S. House of Representatives? (Every election year, a significant number of voters do not know the names of both major-party candidates for congressional seats in their districts; fewer still can name both candidates for state legislatures in their districts. Could you?) Too often, we base our vote on our party affiliation and not on the merit of individual candidates. Worse still, voters sometimes decide on the basis of name recognition alone. Clearly, then, weeding out insufficiently grounded background information is vital if we are to improve our reasoning about important, to say nothing of relatively trivial, matters. (It also might be a good idea to find out something about candidates for various offices before stepping into a booth and casting our ballots.)

Having well-supported background beliefs is particularly important with respect to those basic background beliefs that make up our worldviews. Worldviews are like lenses that cause us to see the world in a particular way or filters through which we process all new ideas and information. Reasoning based on a grossly inaccurate or shallow worldview tends to yield grossly inaccurate, inappropriate, or self-defeating conclusions (except when we're just plain lucky), no matter how smart we otherwise may be. Sometimes, the harm is relatively minor (gamblers who waste a few bucks playing "lucky" lottery numbers; astrology column readers who arrange vacation times to fit their sign), but at other times, the harm can be more serious (people with an overly rosy view of

human nature who get taken by con artists; misanthropes who miss out on the benefits and joys of trusting relationships).

Obviously, then, we need to examine our background beliefs, especially those that make up our worldviews, for consistency and believability, and we need to amend them so as to square with newly acquired information. The point is that having a good supply of background beliefs is not just a matter of filling up one's "tank" with gallons of facts. It is at least equally important to improve one's existing stock of beliefs by weeding out those that experience proves to be false, to sharpen vague beliefs, and to replace crude beliefs with those that are more sophisticated—beliefs that penetrate more deeply into the complexities of life and the world.

People who hold different worldviews often clash on a personal level, but when cultures or nations have conflicting worldviews, they can create tension and spark antagonism internationally. One recent example involved a controversy over whether an Afghan should be sentenced to death because he converted from Islam to Christianity. Under Sharia law, a Muslim who rejects Islam may be tried and executed. So when it became known that the man had converted to Christianity, he was put on trial by the Afghan government, whose constitution allows prosecution under Sharia law. When Muslim clerics demanded that he be sentenced to death, prominent leaders in the Western world urged the government to honor human rights principles and free him. The conflicting worldviews caused an uproar on both sides. When the Afghan government looked for ways to drop the case in order to comply with international pressure, the clerics warned that if the man were freed, the people of Afghanistan would kill him. (The government resolved this dilemma by declaring him mentally unfit and citing "investigative gaps" in the case.) When clashes like this multiply and escalate, they can lead to serious international conflict and even large-scale violence.

The Cost of Entrenched Worldviews

It is worth noting here that widespread failure to revise worldviews often results in serious political and social unrest and injustice. E. M. Forster captures this poignantly in his novel *A Passage to India,* in which he depicts intense conflicts in colonial India between English masters and their conquered Indian subjects. Believing themselves socially and racially superior, the English relegate the Indians to subordinate positions, never allowing them equality under the British raj. The insensitivity of the British to the plight of their subjects is met with resentment, distrust, anger, and threats of violent retaliation by the Indians. (To make matters worse, the Indians are divided from one another by differing religious and cultural beliefs.) Very few of the British or Indians Forster depicts ever revise their biases and prejudices in the light of new information—for instance, in the light of obvious evidence about the competence of individual Indians or the glaring prejudice of English officials. The novel makes a compelling case for a widespread reexamination of worldviews and other background beliefs if human beings are to arrive at a peaceful, nonexploitative coexistence on planet Earth.

Socrates is said to have claimed that the unexamined life is not worth living.[8] While clearly an exaggeration, there surely is a great deal of truth in this idea. By the same token, there is a large dose of truth in the idea that an unexamined worldview is not likely to be worth holding, in particular because it will contain little more than an accumulation of the ideas and prejudices of others. Examining worldviews allows us to take control of our lives by actively sorting out our fundamental beliefs, testing them against ideas and information that point to conclusions contrary to what we already believe, and making whatever revisions are indicated in the light of what we have learned. *Doing this helps us to become our own person rather than just a passive follower of others!*

Unfortunately, it is no easy matter for us to examine our worldviews objectively. Psychological studies show that people hold on to their beliefs for dear life, ignoring evidence that undermines them and dredging up weak evidence to support them. This obstacle to rational thought is compounded by our natural tendency to take short-cuts in reasoning that reduce our mental effort, allowing us to slide past unwelcome evidence and leap to hasty conclusions that support our existing beliefs. All this makes rational self-analysis difficult, to say the least—but not impossible. To reason cogently, we need to fight this human tendency (discussed further in Chapter 6).

12. Two Vital Kinds of Background Beliefs

Background beliefs obviously differ greatly in their importance—that is to say, their propensity to affect (or even determine) our everyday judgments. Two kinds that are extremely important in this way concern the *nature of human nature* and the *reliability of information sources.*

THE NATURE OF HUMAN NATURE

Beliefs about what we ourselves and other people are like constitute a vital part of everyone's worldview. They are crucial in applying what we know to the problems encountered in everyday life, whether of a personal or a social nature. When can we trust our friends? Is an instructor to be believed who says that students are graded solely on the quality of their exams and not on agreement with the instructor's personal opinions? Will people be sufficiently motivated to work diligently under a socialistic system? Are large numbers of elected officials motivated by selfish interests that frequently override their sense of duty to those who have elected them?

Fortunately, we don't have to start constructing theories about human nature from scratch, since other people, including some of the great writers (Shakespeare, Aristotle, Darwin, Freud) have been at the task for some time now. (Of course, tapping these sources has its risks. Freud, for instance, had some way-off-target ideas on the subject to go along with some extremely penetrating ones.)

[8]Note, however, that psychology has just recently come out of its infancy. Note also that there is more chicanery in medical research (because of the profit motive?) than in most other areas of science.

THE RELIABILITY OF INFORMATION SOURCES

Thoughts about the accuracy, sufficiency, and truthfulness of information sources constitute another vital kind of background belief. As with computers, so also with the human mind: "Garbage in, garbage out." We therefore need constantly to reassess the reliability of important information sources—television, newspapers, magazines, friends, the Internet, teachers, textbooks, and so on. Under what conditions are these sources likely to provide truthful or, at least, sensible information or opinions? When are alleged experts likely even to possess the truth, much less be motivated to tell it to us straight? When are they likely to be prejudiced in ways that may cloud their judgment? We can't assume automatically that a source is reliable without some *reason* for believing this. As lamented a while back, many people seem to think that if they read it in print or hear it on the TV evening news, then it must be true. Sophisticated reasoners, however, realize that these information sources do not always furnish "the truth, the whole truth, and nothing but the truth"; they don't necessarily provide us with "All the news that's fit to print" (the *New York Times* motto), instead sometimes shaving matters either out of ignorance or from self-serving motives. Intelligent viewers of the scene thus try to determine when these sources are likely to be reliable and when not. That is why Chapter 10 deals with advertising as an information source, Chapter 11 with the reliability of the news media, and Chapter 12 with new media.

13. Science to the Rescue

The mention of Darwin and Freud a while back brings to mind the central place that science plays in modern life and in the construction of accurate stocks of background beliefs—in particular, in the formulation of sensible worldviews. Although no information source is absolutely reliable and no theory exempt from at least a small measure of doubt, the most reliable, the most accurate information comes from the well-established sciences of physics, chemistry, biology, and, to a lesser extent, psychology, the social sciences, and the applied sciences such as engineering. The scientific enterprise is an organized, ongoing, worldwide activity that builds and corrects from generation to generation. The method of science is just the rigorous, systematic, dogged application of cogent inductive reasoning, mixed with all sorts of deductive—including mathematical—reasoning from what has so far been observed over many centuries to theories about how the universe and the many things in it have functioned and are likely to function. Theories falsified by experience are tossed out, no matter whose pet ideas happen to get stepped on. Absolutely no one, starting from scratch, could hope to obtain, in one lifetime, anything remotely resembling the sophisticated and accurate conclusions of any of the sciences, even if that person were a Galileo, Newton, Darwin, and Einstein all rolled into one. *It is foolish indeed to dismiss what science has to say on any topic without very careful thought and without having extremely important reasons for doing so!*[9]

[9]It is worth noting that this comes to us from the "Apology," Plato's (probably somewhat fictionalized) account of Socrates's trial, where he was accused largely of "examining" himself and others and where he was ultimately sentenced to death.

Indeed, one justification for requiring all high school students to take at least one course in a physical or biological science is to allow them to gain an understanding of the great rigor with which scientific principles are tested and proved. But another, easier way to come to understand the power of science as compared to other ways of finding out about the world is to think carefully about the thousands of everyday items available to us today that did not exist 300 years ago, products that owe their existence to the tremendous advances in scientific theory that have been made since the days of Galileo and Newton. Without science, there would be no automobiles, no airplanes (not to mention spacecraft), no telephones, no electric lightbulbs, no air conditioning, no other electric devices of any kind (certainly no computers!), no batteries, no aspirin or other common painkillers, no anesthetics (alcohol used to be the painkiller used during amputations), no antibiotics (or even knowledge of the existence of microbes and thus the extreme importance of cleanliness), no ways to purify drinking water, no indoor plumbing, no eyeglasses, no insulin for diabetics, . . . the list goes on and on. Instead, there were plenty of mosquitoes and flies (and fly paper) everywhere on summer days, and people made do with commodes, outhouses, and well-drawn drinking and washing water. In those days, doctors could cure only a handful of ailments, horse dung and its foul smell were everywhere in every city and town, lighting after dark was furnished by candles or oil lamps, and so on. Before the existence of the scientific, modern, industrial world, the average life span almost everywhere was less than 50 years, much less in most societies.

Of course, to avoid having beliefs contradicted by scientific theory or to apply scientific principles successfully in dealing with everyday problems, one does have to have at least a casual acquaintance with what science has to say on various topics. The problem is that large numbers of people have no idea what science is up to and have only the tiniest stock of scientific facts about the nature of the world. This lack of knowledge about science can have unfortunate consequences. For instance, a growing number of parents have refused to vaccinate their children against measles on the mistaken belief that vaccines are ineffective preventatives and may even be harmful. They believe that a healthy diet and good living is enough and that their refusal to use vaccinations won't affect anyone but their own children. None of these assumptions is accurate, however. A study published in the *Journal of the American Medical Association* of measles cases over the last 15 years found that recent increases in measles cases correlate with the increase in vaccine refusals. For immunizations to be effective, a high percentage of children need to be vaccinated to protect the population at large. Ignoring the science has resulted in outbreaks of measles, which the Center for Disease Control was able to declare eradicated from the United States before the anti-vaccination movement took root.

Unfortunately, it isn't just the average person (or average college graduate?) who is more or less illiterate when it comes to science. Even those who need to know about specific scientific results in order to do their jobs adequately are frequently remiss in this way. During a quite severe drought in California, one government official defended his inaction by stating that "One problem [in deciding whether to enact water rationing measures] is that we have only 110 years of [precipitation] records. Our statistics [on California droughts] aren't very good." Yet, just prior to that time, a U.S. Geological Survey study of giant sequoia tree rings had yielded a record going back more than 2,000 years.

Students sometimes defend their ignorance of science by arguing that they only need to know the science, if any, that is relevant to the job they will perform after graduation from college. But this is a serious mistake. For one thing, it isn't possible to know now what basic scientific ideas will be relevant to a job held several years down the pike. (It isn't really possible, except in unusual cases, to know what sort of job it will *be,* much less what kinds of knowledge will be relevant to it.) In this increasingly technological age, more and more jobs require at least a general idea of what science has to say about various topics.

More to the point, a rudimentary understanding of science also is of immeasurable value when dealing with all sorts of everyday problems that aren't related to earning a living. Consumers spend millions of dollars every year on over-the-counter nostrums that don't work, or may even be harmful, because they don't know simple scientific facts—for instance, that no remedies they can buy will cure the flulike infections common in

A Crisis in Psychology?

It may be that not all fields that we call "science" are quite as reliable as the developed natural sciences (physics, biology, botany, etc.). This is not a disparagement of so-called "soft science" (roughly the social sciences: psychology, economics, political science, etc.). Work in these fields is often rigorous, fascinating, and useful. And we have much to learn from it.

But at the same time, it may not be quite as simple to rely on results in these fields. Take for instance a recent controversy in social psychology. One key criterion for a scientific result is reproducibility. A successful experiment ought to be able to be conducted again and again by anyone and always yield the same result. If not, then those results are at least subject to doubt if not thrown out entirely. However, in August 2015, a study by the "Reproducibility Project" found that the results of fewer than 40 percent of the 100 experiments published in major psychology journals were reproducible. Social psychology fared particularly badly, coming in at 25 percent.

To be fair, many experimental psychologists have argued that the controversy over these findings and the significant media coverage that followed them was overblown. As Lisa Feldman Barrett, a psychology professor at Northeastern claimed in the *New York Times*, "the failure to replicate is not a cause for alarm; in fact, it is a normal part of how science works . . . It is what leads us along the path—the wonderfully twisty path—of scientific discovery."

One problem with public scientific knowledge in general is that results of scientists' work are often publicized prematurely and misrepresented in the mass media. The lesson here is not that we shouldn't trust psychology or any other social science, but that maybe we should wait a bit until discoveries in these fields (and maybe to some extent in the hard sciences, too) are a little further along Professor Barrett's "wonderfully twisty path" before we fully take them on board. But once results *are* successfully replicated and agreement on a certain hypothesis approaches scientific consensus, we have all the reason in the world to accept it.

winter. Every day, people throw their money away on get-rich-quick schemes that defy the most basic principles of economics. Large sums are wasted on fortune tellers, mediums, and other charlatans whom science has proved over and over again cannot deliver the promised goods. (This point is discussed a bit more in Chapter 6.)

Students often are put off science by the sheer complexity of the subject matter. Biology, for example, has to be an extremely complicated science, given that the bodies of complex living organisms like humans contain trillions of cells, each one of which contains millions of atoms and subatomic particles. (Did you know this?) So the bad news is that every science quickly goes over the heads of almost all laypeople. But the good news is that with only modest perseverance, people who are reasonably intelligent can learn enough about science to greatly improve their everyday reasoning and thus their chances of success in everyday life. (Clearly, similar remarks apply to mathematics, particularly to arithmetic and simple algebra—note the confusion that occasionally results in supermarkets when the power goes out and clerks need to actually add and subtract to figure out what is owed.)

Summary of Chapter 1

Reasoning is the essential ingredient in solving life's problems. This chapter discusses some of the fundamentals of good reasoning and presents an overview of the material to be covered later on the topic of reasoning well in everyday life.

1. *Reasoning* can be cast into *arguments,* which consist of one or more *premises* (reasons) offered in support of a *conclusion.* In real life (as opposed to in textbooks), arguments usually are not labeled and divided from surrounding rhetoric, nor are their premises and conclusions neatly specified. But clues generally are given. *Logical indicators* such as *because, since,* and *for* usually signal premises; *hence, therefore,* and *so,* conclusions.

2. Not all groups of sentences form arguments. They may be anecdotes or other types of *exposition* or *explanation.* Explanations are especially prone to be confused for arguments. In most cases, explanations are meant to show how some claim came to be true, while arguments are meant to persuade us that some claim is true.

3. For our purposes, "winning an argument" means more than just persuading an audience. It means persuading an audience *based on a rational inference from premises to conclusion*.

4. Reasoning is either *cogent* (good) or *fallacious* (bad). Cogent reasoning must satisfy three criteria: It must (1) start with justified (warranted, believable) premises, (2) include all likely relevant information, and (3) be *valid* (correct).

5. There are two basic kinds of valid reasoning: *deductive* and *inductive*. The fundamental property of a *deductively valid* argument is this: If its premises are true, then its conclusion must be true also. This is so because the conclusion of a deductively valid argument already is contained in its premises, although usually implicitly, not explicitly. (Note that a deductively valid argument may have false

premises. What makes it valid is that *if* its premises are true, then its conclusion must be also.) Unlike deductively valid arguments, those that are *inductively valid* (inductively correct, strong) have conclusions that go beyond the claims made by their premises, projecting patterns stated in the premises onto additional cases.

6. There is no truth to claims about there being such things as "feminine logic," different from "male logic." Logic is not "gender-relative." Similarly, there is no truth to the idea that something exists called "black logic," different from the "Eurocentric" variety espoused by white male teachers. Good reasoning does not differ from sex to sex or from race to race; it is not in any way tied to ethnicity. Furthermore, with respect to facts, at any rate, the idea embodied in the idea that "It may well be true for you, but it isn't true for me" is without merit, as is the academic talk of there being something called "Aristotelian linear reasoning," different from a more "intuitive" type of reasoning. (But more needs to be said, and will be, about beliefs concerning values. The point made in this chapter is that, however we may arrive at value beliefs, reasoning from those beliefs must employ the same principles of logic as does reasoning about purely factual matters.)

7. Background beliefs can be divided in many ways, one being into beliefs about *matters of fact* (snow is white) and beliefs about *values* (Jane Austen's novels are better than those of Stephen King). (Note that when speaking of beliefs here, we have in mind a broad sense covering everything accepted as true, or very likely true, and all value judgments and convictions.)

8. Beliefs also, of course, can be divided into those that happen to be true and those that are false. They also can be differentiated in terms of how firmly they are or should be held, and with respect to whether they concern particular events (Jones went to the show last Wednesday) or those that are general (copper conducts electricity).

9. Our most important beliefs, taken together, make up our *worldviews* or *philosophies*. They are particularly important because they enter into decisions of all kinds—about what to do or what to believe—that we need to make in everyday life. ***Examples:*** We all die sooner or later; it's always wrong to betray a friend; the best way to find out about how things work is to use induction and deduction. Note that, although most beliefs in our worldviews are general—even extremely general—a few are not. ***Example:*** We don't know whether there is or isn't a God (part of the worldviews of agnostics).

10. Unfortunately, we all tend at least sometimes to hold a belief without sufficient reason for doing so—for example, when complicated social or political issues are discussed. This is true even with respect to some of the beliefs that make up our worldviews. But worldviews, just as any beliefs, need to be carefully examined: Does evidence support them? Do we really value this more than that? Having an

accurate supply of background beliefs is not just a matter of regularly acquiring more beliefs but also of pruning those we already have.

11. We tend to absorb the beliefs of those around us as we mature from children into adults. Our worldviews, in particular, tend to grow out of family values, religious training, peer group attitudes, cultural heritages, and so on. We often hold these vital beliefs uncritically—indeed, often without realizing that we hold them. Good critical reasoners, on the contrary, try to become aware of and to critically evaluate their background beliefs, especially those making up their worldviews.

12. Beliefs about human nature are of vital importance when reasoning in daily life, because the success or failure of everyday interactions depends on them. Whether we can trust this sort of person or that is an example. That is one reason why reading the writings of great literary and scientific figures is so useful (in addition to being entertaining).

13. Beliefs about the accuracy and truthfulness of information sources also are of great importance, because, as the saying goes, "Garbage in, garbage out." We can't reason well from poor or false information. That is why later chapters in this book deal with several important information sources.

14. Because science plays such an important part in everyone's life these days, it behooves us to become as well acquainted as we can, and as time permits, with the scientific view of the world and with the ways in which scientists come to their conclusions. No one on his or her own could possibly discover even a tiny fraction of what scientists have learned over hundreds of years about the way the world works. (Those who don't see the importance of science in their own lives should reflect on how much we depend, every day, on the fruits of scientific investigations. ***Examples:*** Electrical devices, painkillers and other modern medicines, toilet paper.) Unfortunately, most people do not have even a reasonably good grasp of what science is up to.

EXERCISE SET 1-1

Identify the premises and conclusions in the following arguments. (A few are from student exams—modestly edited.)[10] Remember, sometimes a premise or conclusion may be implied.

Example

Argument

The barometer is falling sharply, so the weather is going to change.

Argument Structure

Premise: The barometer is falling sharply.
Implied premise: Whenever the barometer falls sharply, the weather changes.
Conclusion: The weather is going to change.

[10]Starred (*) items are answered in a section at the back of the book.

1. Since everyone deserves health care, and 30 million Americans still don't have medical insurance, the United States should institute national insurance.

2. I have my doubts about genetically modified plants. To begin with, we don't have enough information about them to know if they are bad for us in the long run. Then there is the problem of cross contamination if they spread to other areas. The whole thing seems pretty questionable.

3. The legacy of the New England Patriots will forever be tarnished, no matter how many Super Bowls they win. They have a long history of cheating, whether we're talking about filming other teams' practices, lying about injuries, or deflating game balls. And that's just the stuff we know about! The truly legendary teams win like the Patriots, but unlike the Patriots, they do it the right way.

*4. William Shakespeare: "Forbear to judge, for we are sinners all."

*5. Why not legalize drugs? One thing for sure, we would get rid of the crime syndicates that run the show now. Instead of giving money to the drug lords, the government would rake in billions in taxes. Maybe even enough to pay down the debt.

6. Aristotle: "The Earth has a spherical shape. For the night sky looks different in the northern and the southern parts of the Earth, and that would be the case if the Earth were spherical in shape."

7. Human activities have become the major source of global warming. Over the past 200 years, they have been responsible for the rising carbon dioxide levels from burning fossil fuels and for increased concentrations of other greenhouse gases like methane and nitrous oxide.

*8. Several years ago, National Football League quarterback Michael Vick was convicted of sponsoring illegal dogfights and performing acts of cruelty to animals. But he has served his time in federal prison and has worked with the Humane Society to help stamp out dogfighting among young people. So his criminal record shouldn't prevent him from getting into the Pro Football Hall of Fame. He was a great quarterback for the Atlanta Falcons before his prison time, and he made a great comeback with the Philadelphia Eagles. He deserves the honor.

9. College costs big bucks. When you put out that kind of money, you should be able to decide where your money goes. Students shouldn't have to take introductory courses if they don't want to. Besides, you don't need those basic courses for lots of careers.

10. Giving illegal aliens driver's licenses would undermine our immigration laws. After all, they are here illegally to begin with. Besides, there is the security issue. If anyone can get a license, so can terrorists, and that means they can fly anywhere in the country with just a license for an ID. Who knows how many planes they might blow up?

EXERCISE SET 1-2

Here are several passages. (Some are from student papers—again, modestly edited.) Indicate which contain arguments and which do not, label the premises and conclusions of those passages that do (as you did in the previous exercise), and explain why you think the other passages do not contain arguments.

Example

Passage from Agatha Christie's novel *Murder on the Orient Express: M. Hercule Poirot, having nothing better to do, amused himself by studying her without appearing to do so. She was, he judged, the kind of young woman who could take care of herself with perfect ease wherever she went. . . . He rather liked the severe regularity of her features and the delicate pallor of her skin. He liked the burnished black head with its neat waves of hair, and her eyes—cool, impersonal and gray.*

Evaluation: *This is not an argument. The author says Poirot judged (reasoned) that the woman could take care of herself, but does not describe his reasoning. And the rest of the passage simply says that Poirot liked certain features of the young woman.*

***1.** If we keep burning so much coal and oil, the greenhouse effect will continue to get worse. But it will be a disaster if that happens. So we've got to reduce dependency on these fossil fuels.

2. We are never going to find a cure for diabetes, cancer, Alzheimer's, and a lot of other diseases unless we use the most promising research available. Stem cell research is the way to go.

3. Stem cell research sounds like a good idea, but it costs a lot of money, and we don't really know if it will cure people. We don't know what the long-term effects will be either. What if it keeps people alive for 200 years—in a world that is already overpopulated? Besides, it's just wrong to take stem cells from embryos.

***4.** My summer vacation was spent working in Las Vegas. I worked as a waitress at the Tropicana and made tons of money. But I guess I got addicted to the slots and didn't save too much. That's why I'll try to find work outside a casino next summer.

5. Legalizing prostitution is bound to increase sexually transmitted diseases. And look what it would do to women. It can't help but lead to their degradation. Besides, most people don't like the idea, anyway.

6. The National Center for Education Statistics estimated that 20.2 million students would attend U.S. colleges and universities in 2015. The average cost of tuition, room, and board for in-state students at four-year public colleges and universities was $19,548, and at private schools, $43,921, according to the College Board's Annual Survey of Colleges.

7. Some people in the field of medicine are keen on embedding computer chips inside the body, but I've got a problem with that. True, the chips could provide

helpful medical information if I'm unconscious or something, which I guess is the main reason for doing it, but I don't want to make that kind of information available to the government or anyone else, for that matter, who might want to invade my privacy.

8. Too much money is thrown at college football and basketball. It's almost like they are professional sports. In fact, lots of athletes go to college to train for pro teams, not to get an education. All the publicity and hero worship draws attention away from the reason for going to school to begin with. It's no wonder many students pick colleges because of their teams, not their academic standing.

9. West Virginia is a state today because Union-allied counties of what was then Confederate Virginia voted to separate shortly after Virginia's secession from the Union in 1861.

***10.** Descartes: "Good sense is of all things in the world the most equally distributed, for everybody thinks himself so abundantly provided with it, that even those most difficult to please in all other matters do not commonly desire more of it than they already possess."

11. Since baseball players who take steroids have an unfair advantage over those who don't, it follows that they should not be inducted into the Hall of Fame, because giving them that honor would corrupt the basic fairness and integrity of the game.

12. Why shouldn't public schools take donations from private business? The government doesn't expend enough money to repair the buildings, let alone pay teachers a decent salary. Besides, big business would demand more for its money—like higher standards and better discipline.

13. Alexis de Tocqueville, *Democracy in America:* Men will never establish any equality with which they will be contented. . . . "When inequality of conditions is the common law of society, the most marked inequalities do not strike the eye: when everything is nearly on the same level, the slightest are marked enough to hurt it.

Hence the desire for equality always becomes more insatiable in proportion as equality is more complete."

EXERCISE SET 1-3

Which of the following passages (modestly edited to make them more straightforward than arguments often are in daily life) do you think are deductively valid? Inductively valid? Defend your answers, showing the structure of those you believe to be valid.

1. A friend of mine told me that the herb echinacea would cure my cold or at least reduce the symptoms if I took it four times a day. So I did what he said, but I didn't get better any faster. A few months later I caught another cold and took echinacea again—this time at the first sign I was sick. But no luck. Next time I'll just take some aspirin. Echinacea doesn't work.

2. If I buy these potato chips, I know I'm going to eat the whole bagful at one sitting. But if I do that, I'll upset my stomach. Well, then, if I buy this tempting item, my guts are going to get upset again. Satan, get thee behind me!

3. My father has always voted for Republican candidates, and my mother has also. Hah! Now that I'm old enough to vote, I'm going to vote Democratic. That'll show them.

4. According to statistics compiled by the U.S. Bureau of Labor Statistics in 2015, full-time workers without high school degrees earned a median of $25,636 per year; high school graduates, $35,256 per year; community college graduates with associates degrees, $41,496 per year; college graduates with bachelor degrees, $59,124; college graduates with professional degrees, $89,960. Is college worth it? Yes, though these numbers are down significantly from 2008.

EXERCISE SET 1-4

1. Use Google or another search engine to search for Martin Luther King's "I Have a Dream" speech. Figure out which parts of the speech state or imply King's philosophy and explain his worldview.

2. Find at least one item on the Internet or in the mass media (a newspaper or magazine article or a television program) that seems to be based on a worldview contrary to the one you yourself hold. Explain your choice.

3. Find at least one item on the Internet or in the mass media that reflects a typically American point of view you happen to share, and explain what makes it typically American. (This is not as easy to do as it sounds. Recalling the content of the box on E. M. Forster's novel may help prod your memory.)

4. Describe a situation in which you changed your mind on some more or less fundamental belief, and explain what convinced you to do so. (This is a very difficult question for many people to answer, another bit of evidence for the fact that much of what goes on in the accumulation and emendation of important background beliefs happens only on the edge of consciousness.)

EXERCISE SET 1-5

1. When Barack Obama and Hillary Clinton ran for the Democratic presidential nomination in 2008, many people thought that the time had come to elect an African American or a woman as president. Never before in our history had two candidates from these politically underrepresented groups both come so close to leading the nation. Both presidential elections since 2008 have included a number of African Americans and women as major-party candidates. What changes in worldviews were reflected in voters' newfound willingness to elect a woman or an African American to the highest position in the country?

2. According to the Pew Research Center, attitudes toward same-sex marriage in the United States shifted massively over the past 15 years, with 57 percent of those polled in 2001 opposing allowing gay and lesbian couples to wed, versus 55 percent of those polled in 2015 who supported legal same-sex marriages. How do you think these shifts were influenced by larger changes in worldview over those years? Also, attitudes toward gay rights in general seem to have shifted much faster in this country than did attitudes toward the rights of African Americans or women. Why do you think that is?

EXERCISE SET 1-6

How do the ideas expressed in the following excerpt from an essay by British philosopher Bertrand Russell compare with those in your own worldview and other background beliefs?

> *The aesthetic indictment of industrialism is perhaps the least serious. A much more serious feature is the way in which it forces men, women, and children to live a life against instinct, unnatural, unspontaneous, artificial. Where industry is thoroughly developed, men are deprived of the sight of green fields and the smell of earth after rain; they are cooped together in irksome proximity, surrounded by noise and dirt, compelled to spend many hours a day performing some utterly uninteresting and monotonous mechanical task. Women are, for the most part, obliged to work in factories, and to leave to others the care of their children. The children themselves, if they are preserved from work in the factories, are kept at work in school, with an intensity that is especially damaging to the best brains. The result of this life against instinct is that industrial populations tend to be listless and trivial, in constant search of excitement, delighted by a murder, and still more delighted by a war.*

Russell's essay, by the way, appeared in the June 1921 issue of the *Atlantic Monthly*. (The more things change, the more they remain the same?)

EXERCISE SET 1-7

Here is an excerpt from a speech delivered to the Utah chapter of NOW (National Organization of Women) in May 1997 by Elizabeth Joseph, in which she argues that polygamy is beneficial to women in the modern world:

> *I've often said that if polygamy didn't exist the modern American career woman would have invented it. Because, despite its reputation, polygamy is the one lifestyle that offers an independent woman a real chance to "have it all." . . .*
>
> *As a journalist, I work many unpredictable hours in a fast-paced environment. The news determines my schedule. . . . Because of my plural marriage arrangement, I don't have to worry [about coming home late]. I know that when I have to work late my daughter will be surrounded by loving adults with whom she is comfortable and who know her schedule without my telling them. My eight-year-old has never seen the inside of a day-care center, and my*

husband has never eaten a TV dinner. And I know that when I get home from work, if I'm dog-tired and stressed-out, I can be alone and guilt free. It's a rare day when all eight of my husband's wives are tired and stressed at the same time.

It's helpful to think of polygamy in terms of a free-market approach to marriage. Why shouldn't you or your daughters have the opportunity to marry the best man available, regardless of his marital status? . . .

Polygamy is an empowering lifestyle for women. It provides me the environment and opportunity to maximize my female potential without all the tradeoffs and compromises that attend monogamy. The women in my family are friends. You don't share two decades of experience, and a man, without those friendships becoming very special. . . . [P]olygamy [is] the ultimate feminist lifestyle.

Compare Joseph's view to your own on marital arrangements. Do you find her ideas persuasive? Does your worldview jibe with hers? Why or why not? Most of us think of monogamy as "natural," yet polygamy has been common in different parts of the world at different times in history. (Although Utah outlawed the practice in the nineteenth century as a condition of statehood, the anti-bigamy law is rarely enforced in that state. Estimates put the number of polygamists in Utah in the tens of thousands, even though it's impossible to verify the statistics, given the illegal nature of the activity.) Portions of Joseph's speech were reprinted in the February 1998 issue of *Harper's.*

EXERCISE SET 1-8

Here are some questions from a science knowledge quiz periodically given by the Pew Research Center as part of a study on the impact of science on society. Give it a try.

1. Which kind of waves are used to make and receive cellphone calls?

A. Radio waves
B. Visible light waves
C. Sound waves
D. Gravity waves

2. Which of these is the main way that ocean tides are created?

A. The rotation of the Earth on its axis
B. The gravitational pull of the moon
C. The gravitational pull of the sun

3. What does a light year measure?

A. Brightness
B. Time
C. Distance
D. Weight

4. Denver, Colorado, is at a higher altitude than Los Angeles, California. Which of these statements is correct?

A. Water boils at a lower temperature in Denver than Los Angeles.
B. Water boils at a higher temperature in Denver than Los Angeles.
C. Water boils at the same temperature in both Denver and Los Angeles.

5. Which of these elements is needed to make nuclear energy and nuclear weapons?

A. Sodium chloride
B. Uranium
C. Nitrogen
D. Carbon dioxide

Check your response against the percentage of adult Americans who answered the questions correctly.

1. A 72% 2. B 76% 3. C 72% 4. A 34% 5. B 82%

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A canine induction by enumeration.

2 More on Deduction and Induction

Truth is more of a stranger than fiction. —Mark Twain

Man has such a predilection for systems and abstract deductions that he is ready to distort the truth intentionally; he is ready to deny the evidence of his senses in order to justify his logic. —Fyodor Dostoevsky

The pure and the simple truth is rarely pure and never simple. —Oscar Wilde

Every man is encompassed by a cloud of comforting convictions, which move with him like flies on a summer day. —Bertrand Russell

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1. Deductive Validity

In Chapter 1, we distinguished between deductively valid and inductively valid arguments. Here now is a discussion of some of the basic principles of deductive reasoning, which, by the way, the vast majority of people find quite intuitive.

As pointed out in Chapter 1, different arguments may have the same *form,* or *structure.* Here are two arguments that have the same form—namely, *modus ponens:*

(1) **1.** If it's spring, then the birds are chirping.
2. It is spring.
∴**3.** The birds are chirping.

(2) **1.** If a world government doesn't evolve soon, then wars will continue to occur.
2. A world government isn't going to evolve soon.
∴**3.** Wars will continue to occur.

In Chapter 1, we noted that the form of *modus ponens* can be indicated this way:

1. If *A* then *B.*
2. *A.*
∴**3.** *B.*

Now, here is another commonly occurring deductively valid form, called ***modus tollens***:

Form:
1. If *A* then *B*.
2. Not *B*.
∴**3.** Not *A*.

Example:
1. If it's spring, then the birds are chirping.
2. The birds aren't chirping.
∴3. It isn't spring.

Here is still another commonly occurring deductively valid argument form, usually called **hypothetical syllogism**:

Form:
1. If *A* then *B*.
2. If *B* then *C*.
∴**3.** If *A* then *C*.

Example:
1. If we successfully develop nuclear fusion power, then power will become cheap and plentiful.
2. If power becomes cheap and plentiful, then the economy will flourish.
∴**3.** If we successfully develop nuclear fusion power, then the economy will flourish.

And here is the deductively valid form called **disjunctive syllogism**:[1]

Form:
1. *A* or *B*.
2. Not *A*.
∴**3.** *B*.

Example:
1. Either Clinton won in 2016 or Trump did.
2. Trump didn't win.
∴**3.** Clinton did.

Note that, while the first premise is true, the second, unfortunately for Clinton, is false, as is the conclusion. Nevertheless, the validity of this argument guarantees that *if* both its premises had been true, *then* so would its conclusion have been true.

Finally, here are several argument forms of a different kind (all but the first two are called *syllogisms*):[2]

Form:
1. No *F*s are *G*s.
∴**2.** It's false that some *F*s are *G*s.

Example:
1. No police officers accept bribes.
∴**2.** It's false that some police officers accept bribes. (Uh-huh.)

[1]Strictly speaking, in spite of their names, *disjunctive syllogism* and *hypothetical syllogism* are not syllogisms.

[2]For additional material on deduction and induction see the Appendix, and see also: Hausman, Alan, Howard Kahane, and Paul Tidman. *Logic and Philosophy.* 12th ed. Boston: Wadsworth, Cengage Learning, 2013.

Form:
1. All *F*s are *G*s.
∴**2.** If this is an *F*, then this is a *G*.

Example:
1. All french fries are tasty.
∴**2.** If this is a french fry, then it is tasty. (No dispute on this one.)

Form:
1. All *F*s are *G*s.
2. All *G*s are *H*s.
∴**3.** All *F*s are *H*s.

Example:
1. All TV evangelists have high moral standards.
2. All who have high moral standards live up to those standards.
∴**3.** All TV evangelists live up to high moral standards. (Umm. . . .)

Form:
1. All *F*s are *G*s.
2. This is an *F*.
∴**3.** This is a *G*. (Note that this is *not* the form called *modus ponens*!)

Example:
1. All elected officials always tell the truth.
2. Barack Obama is an elected official.
∴**3.** Barack Obama always tells the truth.

Form:
1. All *F*s are *G*s.
2. No *G*s are *H*s.
∴**3.** No *F*s are *H*s.

Example:
1. All males are chauvinist pigs.
2. No chauvinist pigs are likeable.
∴**3.** No males are likeable.

Form:
1. No *F*s are *G*s.
2. Some *H*s are *F*s.
∴**3.** Some *H*s are not *G*s.

Example:
1. No foreigners can be trusted.
2. Some newborn babies are foreigners.
∴**3.** Some newborn babies cannot be trusted. (Obviously.)

In daily life, arguments tend to get strung together into larger arguments leading up to a point, a grand conclusion or **thesis**. Here is an example (with logical structure exhibited to the left) in which the conclusion of the first argument is used as a premise in the second, and the conclusion of the second is used as a premise in the third and final argument:

1. If *A* then *B*.	**1.** If a world government doesn't evolve soon, then wars will continue to occur.
2. If *B* then *C*.	**2.** If they continue to occur, then nuclear weapons will proliferate
∴**3.** If *A* then *C*.	So, **3.** if a world government doesn't evolve soon, then nuclear weapons will proliferate.
4. If *C* then *D*.	**4.** If they proliferate, then a nuclear war will be inevitable, sooner or later.

∴**5.** If *A* then *D*.	Which proves that	**5.**	if a world government doesn't evolve soon, we'll end up fighting a nuclear war sooner or later.
6. Not *D*.	But	**6.**	it's ridiculous to think we'll actually have a nuclear war (that is, it's false that we'll have such a war).
∴**7.** Not *A*.	So	**7.**	a world government is going to evolve soon (that is, it's false that a world government won't evolve soon).

2. Deductive Invalidity

Any argument that doesn't have a deductively valid form is said to be **deductively invalid**.[3] The number of deductively invalid argument forms is legion, but a few occur so frequently that they've been given names. Here are two examples (to give the flavor):

Fallacy of **denying the antecedent**:

Form:
1. If *A* then *B*.
2. Not *A*.
∴**3.** Not *B*

Example:
1. If abortion is murder, then it's wrong.
2. But abortion isn't murder.
∴**3.** Abortion isn't wrong.

The conclusion doesn't follow: Even supposing abortion isn't murder, it may be wrong for other reasons.

Fallacy of **affirming the consequent**:

Form:
1. If *A* then *B*.
2. *B*.
∴**3.** *A*.

Example:
1. If Trump is president, then a conservative is now president.
2. A conservative is now president.
∴**3.** Trump is president.

The conclusion doesn't follow: some other conservative may now be president.

3. Conditional Statements

A number of the argument forms we just discussed—the valid *modus ponens, modus tollens, hypothetical syllogism,* and the invalid *denying the antecedent* and *affirming the consequent*—involve statements of the form "If A then B." We call these **conditional statements**, and they deserve a little specific attention here.

[3]A deductively invalid argument still may be a good argument if it is inductively correct. Arguments that have the forms about to be discussed are bad because they are neither deductively valid nor inductively correct.