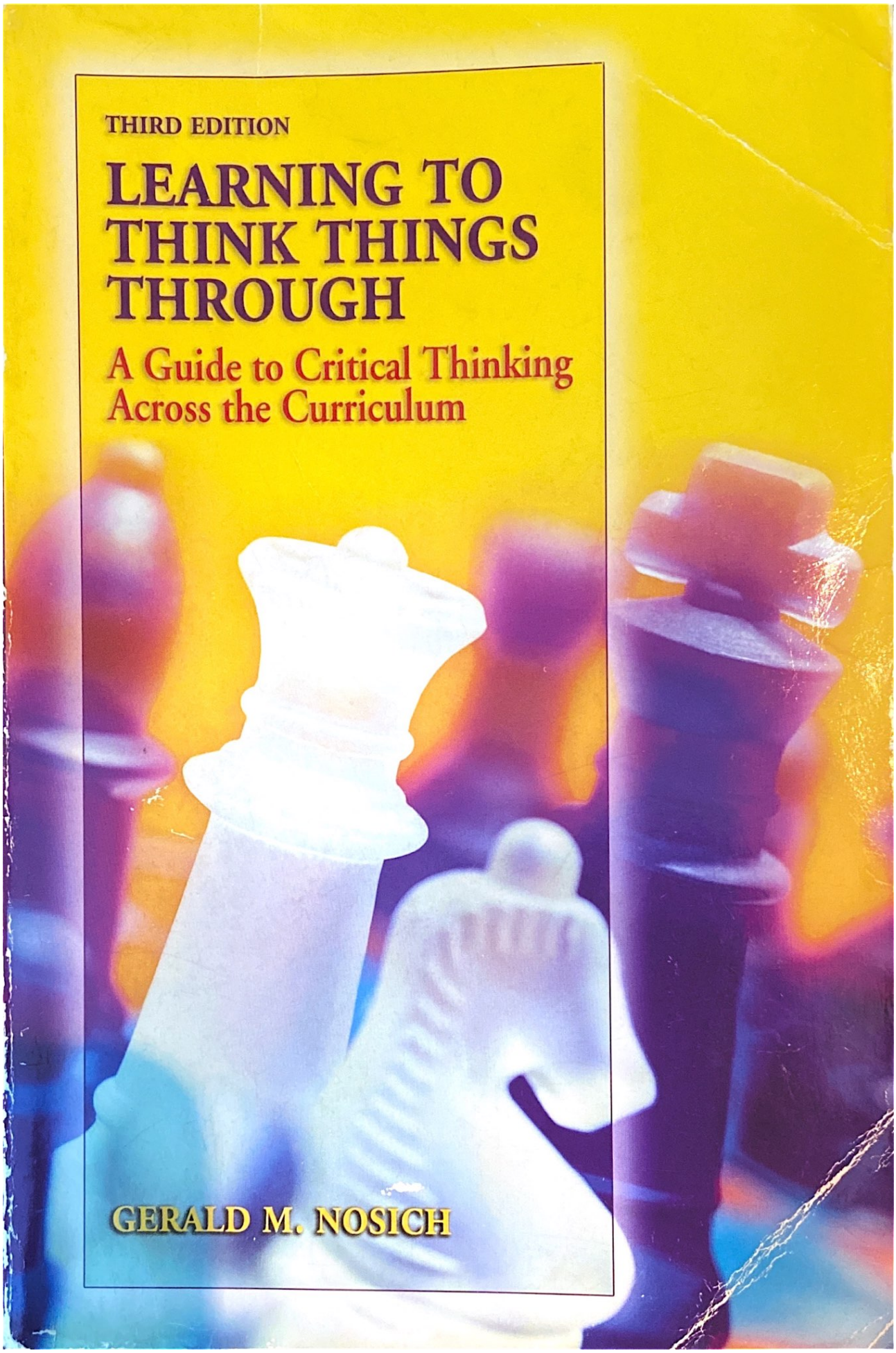
THIRD EDITION

LEARNING TO THINK THINGS THROUGH

A Guide to Critical Thinking Across the Curriculum



GERALD M. NOSICH

Chapter 1

What Is Critical Thinking?

Often, a good way to begin the process of thinking critically about a subject is to do some conscious thinking about it *before* you do any reading or hear any presentations in the subject. Thus, if you are going to study biology or sociology or writing, a good way to begin is by writing down some of the main ideas you already have about biology or sociology or writing itself *before* you do any reading or listen to lectures. This allows you to be an active listener rather than a passive recipient of information. It helps you to become aware of your assumptions about the subject so that you can assess them more accurately in light of what you will later read and hear.

Some Definitions of Critical Thinking

Here are three definitions of critical thinking by leading researchers. First, Robert Ennis's classic definition:[1]

> Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do.

Even before you start reading this text, begin by examining your own concept of critical thinking. Before you start reading this text, respond to the following in a paragraph or two:

1. What is your concept of *critical thinking*? You can respond to question (1) by giving a description. An alternative way to address it, though, is to use examples.
2. Describe a situation in which you thought through something critically.
3. Describe a situation in which you did not think through something critically.

Then write a paragraph describing how, in your best judgment, critical thinking is necessary within the subject matter you are studying.

Next, Matthew Lipman's definition:[2]

> Critical thinking is skillful, responsible thinking that is conducive to good judgment because it is sensitive to context, relies on criteria, and is self-correcting.

Finally, in informal presentations, Richard Paul uses this definition:

> Critical thinking is thinking about your thinking, while you're thinking, in order to make your thinking better.

Revise your concept of critical thinking over the course of the semester. Reformulate it (maybe scrapping it entirely and starting over) so that it accords with your deepening grasp of what critical thinking is.

Each of these is an excellent definition of critical thinking. It pays to read them several times and to stop and reflect on every aspect of each definition. Why did the expert include this word rather than another? Just what are the experts trying to capture with the words they have chosen? What overlap is there in the definitions, and what main differences of emphasis are there?

It may seem hard to believe, but each of these definitions, brief as they are, is the product of a long period of intense pondering about how best to describe critical thinking. Each definition is an attempt to convey in words the essence of an activity, a "thing"—critical thinking. Before trying to define it, each expert had an intuitive grasp of what critical thinking is, based on years of working with it. This was what the experts tried to capture in the words they chose.

So in reading the experts' definitions and in the discussion ahead, one very important goal to keep in mind is for you to develop a solid intuitive grasp of just what critical thinking is and what it is not.

Some Prominent Features of Critical Thinking

Critical Thinking Is Reflective

Critical thinking is different from just thinking. It is metacognitive—it involves thinking about your thinking. If I enter a social studies course where one of the topics to be studied is conformity, it is likely that I already have views about conformity: what it is, how prevalent it is, what influences people to conform or not conform. I have these views even if I haven't formulated them explicitly for myself. Each view is an example of thinking, but not necessarily an example of critical thinking. Critical thinking starts once I reflect on my thinking: Why do I have these views about conformity? Since my views are really conclusions I have drawn, what evidence are they based on? How do other people look at conformity differently? What are their views based on? How can I tell which are more accurate, their views or mine?

Critical Thinking Involves Standards

Critical thinking involves having my thinking measure up to criteria. I can think about something accurately or inaccurately. I can use evidence that is relevant to an issue or irrelevant, or somewhere in between. When I reason out and try to understand the main ideas in a course I'm taking, I can do so on a superficial level or I can try to understand them deeply, trying to get at the heart of the matter.

Accuracy, relevance, and depth are examples of standards or criteria. The words *critical* and *criteria* come from the same root, meaning "judgment." For my thinking to be *critical* thinking, I have to make judgments that meet criteria of reasonableness.

Critical Thinking Is Authentic

Critical thinking, at its heart, is thinking about real problems. Although you can reason out puzzles and brain-teasers, the essence of

critical thinking comes into play only when you address real problems and questions rather than artificial ones. Critical thinking is far more about what you actually believe or do. It is about good judgment. Puzzles and narrow problems may help occasionally when you want to hone or practice special skills, but even those skills help only if you consciously transfer them to real-life settings. Honing your skills at guessing the endings of murder mysteries is not likely to be good preparation for becoming a criminal investigator. In murder mysteries, all the clues are provided, the murderer is one of the characters, and someone (the author) already knows the murderer's identity. None of that is so in a criminal investigation.

Real problems are often messy. They have loose ends. They are usually unclear: clarifying and refining them are part of thinking through them. They often have no single right answer. But there are wrong answers, even disastrous answers: there may not be any unique right person to take as your partner in life, but there are certainly people it would be disastrous to choose.

AUTHENTIC PROBLEMS

To get the feel of authentic problems (in contrast to "school problems"), think of good novels you have read, or plays or movies you have seen. (Exclude contrived movies where everything automatically works out according to a formula.) Now consider the problems that are facing some character. Those will likely be *authentic* problems. They are full of complications and other people's cross-purposes; actions don't work out exactly as planned; emotions and desires are heavily involved in the decisions people make.

Choose an example or two like that, and try to reason through decisions that the character could make.

Critical Thinking Involves Being Reasonable

There are no surefire rules of reasoning. That is, no rules are so foolproof that they guarantee your reasoning will be successful. There are guidelines, even "rules" sometimes, but these always need to be followed thoughtfully, not by rote. You need to apply them with sensitivity to context, goals, practical limitations—a whole host of realities. For thinking to be critical thinking, it must be reasonable thinking.

Compare critical thinking to driving a car. There are rules for good driving (e.g., merge when entering an interstate), but merely following the rules won't make you a good driver. To be a good driver you have to follow the rules *mindfully*. What does that mean? It means, for example, following the rules while being aware that the purpose of merging is to allow traffic to flow more smoothly and reduce collisions between fast- and slow-moving cars, that weather and traffic conditions affect how you should merge, and so on. Notice that this is an open-ended list of what a mindful driver is aware of while merging.

We often long for surefire, step-by-step procedures, and the more personally important or threatening a situation is, the more we want foolproof rules. But there are no rules that guarantee our thinking will be correct—and that is especially true in very important or threatening situations. There are no rules to tell us if our reasoning is correct, precisely because we must use our reasoning to evaluate rules, rather than vice versa. The only way we can decide whether to follow certain rules is if we use our best reasoning to determine that those rules are reasonable, that they lead to reasonable results when followed. Critical thinking is "self-correcting" at least partly because it is the court of last resort. There is no level of greater certainty beneath it that we can use to evaluate our reasoning.

Three Parts of Critical Thinking

Full-fledged critical thinking involves three parts. First, **critical thinking involves asking questions**. It involves asking questions that need to be asked, asking good questions, questions that go to the heart of the matter. Critical thinking involves *noticing* that there are questions that need to be addressed.

Second, **critical thinking involves trying to answer those questions by reasoning them out**. Reasoning out answers to questions is different from other ways of answering questions. It is different from giving an answer we have always taken for granted but never thought about. It is different from answering impressionistically ("That reminds me of . . ."), or answering simply according to the way we were raised, or answering in accordance with our personality. It is also different from answering by saying the first thing that comes into our mind, and then using all our power of reasoning to defend that answer.

Third, **critical thinking involves believing the results of our reasoning**. Critical thinking is different from just engaging in a mental exercise. When we think through an issue critically, we internalize the results. We don't give merely verbal agreement: we actually believe the results because we have done our best to reason the issue out and

we know that reasoning things out is the best way to get reliable answers. Furthermore, when we think critically through a decision about what to do in a situation, then what follows the reasoning is not just belief, but action: Unless something unforeseen occurs, we end up taking the action we concluded was most reasonable.

Asking the Questions

Critical thinking begins with asking questions. If a teacher assigns a homework problem to solve, a good question to ask is "How can I best solve this problem?" Often, though, students, don't ask this question at all. Instead, they just jump in and try to solve the problem by any method that springs to mind. Thinking critically about solving a problem, in contrast, begins with asking questions about the problem and about ways to address it:

- What are some alternative ways of solving the problem assigned?
- What is a good way to begin?
- Do I have all the information I need to start solving the problem?
- What is the purpose behind the problem?
- Can the problem *be* solved? Does it even make sense?

All of these questions are relevant when a problem is assigned. But when teachers assign problems, they have already done a fundamental part of the questioning. Posing a problem is asking a question. So, a major part of learning how to think critically is learning to ask the questions—to pose the problems—yourself. That means noticing that there are questions that need to be addressed: recognizing that there are problems. Often, this is the hardest part of critical thinking.

This is true not just in school, but in daily life as well. People often do not ask themselves, "How can I best get along with my parents (my partner, my co-workers, my friends) in this situation?" Instead, they continue relating to them in habitual and unexamined ways. If your goal is to improve some aspect of your daily life, begin by asking yourself some questions: What are some concrete things I can do to improve my job performance? to make better grades? to meet new people? to read more effectively? to make the subject matter of this course meaningful in my life?

To be effective, you need to really *ask* these questions. It's not enough just to say the words. In fact, when you look at the questions just posed, they can seem empty. But that's not because they *are* empty. Whether a question is empty or not depends a great deal on the spirit in which you ask it. If you ask it in an empty way, just going through the motions, then it's not a genuine question at all, not for you, and it will not be the beginning of thinking critically through that question.

Here are some questions that teachers list as ones that students do not ask, but should be asking, in their courses:

- How does what I learn in this course relate to my own experience?
- How can I use what I learn here in my own life?
- Can I think up my own examples?
- How does this subject matter relate to other courses I am taking?
- What is the evidence behind this?
- How do the topics in this course fit together?
- What is the purpose of the course?
- Why?

Finally, people often ask what makes something a good question. Though many approaches to this will emerge during the course of this book, in the end a good question is one you really want to know the answer to. (How to approach and answer critical-thinking questions is addressed in more detail in Chapter 5.)

CRITICAL WRITING

Write down three questions you have about critical thinking. Then, write down three questions you have about how you will be using critical thinking *in this course.*

Of the six questions you wrote, pick out the one you think is the best.

(If no real questions came up for you, even after pushing, what conclusions do you draw from that?)

Identify some situations in your life that are problematic, ones that are not going as well as you think they should. Write them as questions. Be specific in how you describe them. Don't just say "How can I get along with my friends?" Focus it: "How can I best deal with Arthur when I feel him pressuring me to do X and I really don't think I should be doing X?".

Write a list of some further questions you should be asking about those situations.

Reflect on your educational experience a little. Which of the questions listed by teachers are ones you tend to ask yourself in courses you are taking? Which of them do you never (or almost never) ask?

Try keeping a journal of questions that arise during a course you are taking now. Questions may be about the subject matter itself, about how it affects you (or *does not* affect you), about how you can use it, about implications of the course, about the way it is taught, about the assignments given, about assignments *not* given.

Reasoning It Out

Although asking questions is necessary to begin critical thinking, merely asking the questions is not enough; the questions need to be answered (or at least addressed). Often we raise questions only to worry about them, or to torment ourselves, or even to put off action, instead of trying to answer them by thinking them through.

For example, a significant number of students have difficulty in math-related fields. They sometimes ask the question, "Why am I so bad at math?" They then use this question to make negative judgments about themselves ("I'm just hopeless at math, and I always will be") or about the field ("I don't need to know math to be a good nurse"), or they answer it with unhelpful generalities ("I'm no good at it because of the way I was taught"). Reasoning it out, however, requires approaching the question in a different way and with a different spirit. It is the spirit of genuinely wanting to figure out a clear, accurate answer to a question that is important to you. Reasoning it out might begin with rethinking the question and then reformulating it in a more neutral and productive way: "What are the main causes of my problems with math, and what are some good ways to begin dealing with them?" You might then read a little about what causes problems in learning math and apply the information to your own case. You could talk to counselors about alternative approaches that have helped other students, take seriously what the counselors say, and note any resistance you feel to the new approaches. Reasoning it out may not "solve" the problem, but it does provide a significantly better way of addressing the problem than not reasoning it out at all.

In contrast, there are many *uncritical* ways to try to answer questions, ones that do not involve much reasoning. You can:

- ask someone (and simply accept the answers uncritically)
- answer according to the way you have been raised (and accept that without examining whether it was a healthy way to be raised)
- answer without looking for information, even if it's readily available
- answer in accordance with your personality (without examining the extent to which your "personality" helps or hinders you in this kind of situation)
- answer with what first comes into your head

It is easy to misunderstand questions about reasoning. Thus you might interpret the second item listed as implying that critical thinking is opposed to the way you were raised, but that is not what it means. What critical thinking is opposed to is acting in the way you were raised, without examining it. For example, someone raised in a family where violence and abuse were taught, or where blind obedience to authority was taken for granted, should not simply follow those values.

The two greatest difficulties in reasoning are not what you might expect. It isn't that people aren't good at reasoning, or that they make mistakes. Everyone is good at it in some areas and not so good in others; everyone makes mistakes; everyone can improve. But these are not the most crucial difficulties. They go deeper. The first is that, when presented with a problem, people often don't think to reason in the first place. It's just not the usual human reaction to a problem. This is partly because societies do not encourage reasoning as an approach to important questions. The second difficulty is that people often do not know the difference between reasoning through something and other ways of responding. As a result, people respond with what seems to be reasoning, but isn't.

For example, a discussion is not automatically an example of critical thinking. Often in discussions, each participant says what he or she believes, and that's the end of the

REASONING VERSUS NONREASONING

What are some important differences between a debate and a reasoned debate? Between writing a reaction paper and a reasoned reaction paper? Between evaluating an essay and giving a reasoned evaluation of an essay?

matter. In a reasoned discussion, however, listening is as important as speaking. Participants try to understand the reasons behind other people's beliefs, and they try to identify both the strong and weak points of the views expressed. The whole spirit is different.

So, "reasoning things out" really means reasoning them out *well*. What does it mean, then, to reason through something well?

Reasoning itself is drawing conclusions on the basis of reasons. *Good* reasoning, therefore, is drawing conclusions on the basis of reasons and giving due weight to all relevant factors. Relevant factors include the *implications* of drawing those *conclusions*, the *assumptions* on which the reasoning is based, the *accuracy* of the reasons used, the *alternatives* available, and a number of other elements (Chapter 2) and standards (Chapter 4).

Although it's not difficult to define good reasoning in an open-ended way, the challenge is to spell it out in a way that is usable by you, one that lays a foundation so your ability to reason well can improve and deepen during the rest of your life. A good deal of the rest of this book is devoted to that.

Believing the Results

Critical thinking, in the fullest sense, results in belief. It even results in action. Here is an example. A teacher lowers my course grade because I missed too many classes, and I feel unfairly treated. So I raise the question: "Was my teacher being fair in giving me this grade?" Next, I reason my way to an answer: I collect information (maybe I ask the teacher about it; I check what the syllabus said about missed classes; maybe I check to see if other students were treated the same way); I consider the teacher's point of view on the issue and her purpose in lowering my grade because of absences. After reasoning it through—reasoning it through well, I believe—suppose I come to the conclusion that my teacher was fair in what she did. The next step seems so obvious as not to need stating: I believe the results of my reasoning; I believe that my teacher's actions were in fact fair.

However, taking this last step isn't always easy. Even after reasoning it out, I may still have feelings of being unfairly treated, and I may still suspect that I *was* treated unfairly.

What is going on in this example is an indication that I have not thought through the issue critically, at least not in a complete enough way. Maybe there are other questions I should be raising ("Could my feelings of being treated unfairly arise from other circumstances in my life?" "What concept of fairness am I using in my thinking?"). Maybe there are alternative explanations to consider; maybe I am making some unstated assumptions that are influencing my feelings. Or else, maybe I should just believe the results: the teacher was being fair and my original estimate of unfairness was really off the mark (and I need to remember that feelings of being unfairly treated, even if they are unjustified, often take time to go away).

Believing the results is a rough test or measure of the completeness of your critical thinking. If you have reasoned something out and come to a conclusion but find you still don't really believe it, that indicates the reasoning is probably not complete. Important factors probably are missing—factors that lead you to resist internalizing the results.

It is more controversial to link critical thinking to action. Suppose, for example, I continue to smoke or to eat too many saturated fats despite the fact that I've done a lot of reasoning about the importance of giving them up. Is that a flaw in my critical thinking? If I can state all the compelling reasons but still do not act on my reasoning, how good is my critical thinking? Experts disagree on the answer.

The suggestion here is that there is some flaw in the critical thinking. The flaw can lie in how I think about my own body, or about my life, or about the relation between abstract statistics and my chances of survival. I might have an overriding background belief that those statistics don't apply to me, or that even though it's important for me to give up smoking, it's not important that I do it now. Sometimes you can even get the impression that certain people don't believe they will ever die. There is a subtle relation between denial and lack of critical thinking, one that has not yet been fully explored.

It is difficult to identify examples of not believing the results of our own reasoning. That's because, paradoxical as it may sound, it's hard to become aware of what we actually believe and don't believe. There are four indicators of when we are not believing the results of our reasoning (but only the last one is even moderately easy to spot in ourselves):

1. I reason something out, but strong emotions arise within me against the result.
2. I find myself believing contradictory things.
3. I believe something very strongly, but I find I am unable to come up with any good reasons for the belief. In fact, I don't think I even need reasons. Thinking the opposite seems ridiculous.
4. I reason something out, but my actions do not follow my reasoning.

The following are examples of the first three indicators (but they may not be convincing to you, especially if you share the beliefs in question):

1. ■ Michael reasons out the issue of capital punishment as a deterrent. He gathers information and concludes that it does not significantly deter murder or other violent crimes. But after his investigation, he feels angry. He says, "Maybe that's true, but I'm still in favor of capital punishment because you have to do something to stop criminals."

- Maria, taking a course in gender studies, reasons her way through the argument that there is no nonsexist reason why a woman should adopt her husband's name at marriage. Like Michael, Maria discovers that the more she follows the argument, the angrier she gets.

2. ■ Pete believes that all cultures and all cultural practices are equally valid. He believes people do not have a right to say that a particular culture's practices are wrong. But he also believes that it's part of our Western culture to impose our ideas on others, and that it's wrong for us to do that.
   - Most of us believe that everyone should be treated equally, but that does not prevent us from thinking we deserve special breaks.
3. ■ Some people think that eating dogs, cats, or seagulls is revolting, but that eating cows or chickens is quite reasonable. They believe this despite the fact that all their reasoning shows the cases are identical. They find themselves trying to make up reasons that they know don't work (such as, "Dogs and cats are pets! That's why it is wrong to eat them").
   - In critical-thinking presentations, Vincent Ruggiero asks, "Why not turn cemeteries into parks where children can play?" (Can you give a good reason against it?) "We're running out of room: why not bury people in the median strips of highways?"

When you've thought through something critically and come to the conclusion that seems most reasonable to you, it should follow (a) that you believe it, and (b) that you start acting in accordance with that belief.

An appropriate exercise would be to ask you to identify situations where you do not believe the results of your reasoning, where each of the four causes applies to you. But that is extremely difficult. Can you identify any examples where indicators (1), (2), and (3) apply to you? If you can find even one, that's a major insight into yourself. (It sometimes helps to begin with other people, and then apply the results to yourself.)

With indicator (4), however, it should be easy to identify some examples of actions you continue to engage in even though your best reasoned thinking tells you that you should not.

What Critical Thinking Is *Not*

A number of widespread misconceptions about critical thinking can throw off your understanding of critical thinking and influence the way you develop in your thinking skills.

Critical Thinking and Negativity

Critical Thinking Is Not Negative

The word *critical* often has negative overtones. A "critical person" is one who does a lot of fault-finding. To "criticize" someone usually means to say something negative. A "critic" is often thought of as someone who is against something.

But the word *critical* in "critical thinking" has no negative connotations at all. It is related to the word *criteria*: It means thinking that meets high criteria of reasonableness. To learn to think critically is to learn to think things through, and to think them through well: accurately, clearly, sufficiently, reasonably. Some people have proposed the term *effective thinking* as a synonym for "critical thinking," and using that term can help in removing negative overtones. Critical thinking does involve making judgments. Unfortunately, the term *judgment* has also acquired negative connotations in certain contexts. To be judgmental is certainly not to be a critical thinker, and the judgments a critical thinker makes are far removed from being judgmental.

We cannot exist without making judgments. We make judgments all the time, whether we know it or not. People sometimes say, "I just want to accept people the way they are—myself included—without making judgments about them." There can be a lot of wisdom in that approach. It can mean, for example, "I am going to accept people as having the feelings they have, and the reactions they have, without condemning them for it." That is, refraining from making judgments often means refraining from making harsh value judgments. But it can't be generalized to mean not making judgments

Using the word *critical* in the sense of *critical thinking*, what would you say are the main earmarks of critical reading? What is the difference between reading your text and reading it *critically*?

How about critical listening? What is the difference between listening to a lecture in a course and listening to it *critically*?

Can a person listen critically and not disagree at all?

at all. To accept people's feelings and reactions as they are involves making a judgment—the judgment that those indeed *are* their feelings and reactions. Critical thinking comes in directly because accepting people as they are presupposes making accurate, clear, relevant judgments about what their feelings and reactions are. That is accepting people as they are, rather than imposing preconceptions on them.

The Importance of Negative Feedback

Another aspect of negativity is that sometimes sensitivity to negative feedback gets in the way of critical thinking. Suppose someone makes a judgment about your work—that it is inaccurate or unclear, or not relevant to the question asked. Maybe the person even personalizes it, criticizing you when he or she is actually talking about your work. The person might say *you* are unclear or inaccurate. Maybe the person even says it harshly.

You need to sort out the judgments, separating out the harshness or the over-generalization on the speaker's part. You are left with feedback about your work on this occasion. Many people view such feedback as negative, but you don't have to view it that way. Instead, you can choose to view it as a source of valuable information. If you can distance yourself from the negativity, you can free yourself to look for the kernel of truth it may contain. First, it should be clear that you are free to accept or reject people's judgments about you or your work. That's a simple statement of fact. That is not saying it's right or wrong to do so. It's saying that you *can*. It is within your ability. That includes your teacher's judgments about you. In fact, you already do this.

Because the judgment is not binding on you, you can choose what to learn from it. You may learn something about the other person ("My teacher values grammar very highly. Just how important is grammar?"); but you may also learn something about your work and the way you think ("Well, the fellow student who is responding to my answer says this is irrelevant. Maybe I need to explore this. Did I just write something down because it simply popped into my head? Did I imagine a connection that isn't really there? Or did I not state the connection as clearly as I needed to?").

Critical Thinking and Emotions

Critical Thinking Is Not Emotionless Thinking

One of the most widespread myths about critical thinking, and one of the most harmful too, is that critical thinking is somehow opposed to emotions. According to this myth, the best way to think critically is to be devoid of emotions or, if emotions arise, to put them aside, don't let them influence your conclusions. The image in this myth is of someone coldly rational, someone who puts aside his or her feelings in order to be "logical."

This is one of the most misleading myths there is, and it is all the more damaging because there is a grain of truth in it. Some emotions do indeed get in the way of critical thinking: rage and panic, for example. It is extremely difficult for people to think clearly about a decision when they are enraged. Often, the only reasonable thing they can do in such circumstances is to put off action until the rage subsides, maybe helping it to subside by exercising, or by deep breathing, or by not letting the same enraging thoughts keep repeating in their head.

So, some emotions can interfere with critical thinking. But certain other emotion-laden states help with critical thinking: the love of truth is an example. So are the joy of discovery, anger at biased presentations of information, and fear of making an unreasonable decision when something very important hangs in the balance.

Consider as an example something that intrinsically involves a lot of emotion: love. Suppose you are the mother of a child. What will help you in being a good mother? A good mother is one who acts in accord with high standards of critical thinking: she has the best interests of her child at heart; she does not neglect her own interests, but she nurtures and makes wise decisions in the best interests of her child, weighs relevant alternative courses of action, and understands the child's strengths and weaknesses, the child's growing need for both autonomy and safety; she is creative about finding ways to help her child develop in a healthy way. Now, what is the role of love in this? It should be clear that love—far from being an impediment to clear thinking—is *essential* to being a good critically thinking mother. Love is a large part of what motivates the thinking, grounds it, helps her to assess choices that confront her as a parent. The emotions that go along with love are not in any way opposed to the thinking required to be a good parent.

The same can be said about romantic love. Sometimes it may seem that being in love is opposed to critical thinking, but often this stems from a superficial concept of love. For example, people who are in love often engage in wishful thinking. Suppose Ashley is in love with Lou and Lou is an alcoholic. A common scenario is that Ashley keeps thinking that Lou will be cured any day now, even though it may be clear to others that Lou is not on the road to recovery. But thinking, against all the evidence, that Lou's cure is just around the corner is not an example of love interfering with critical thinking. It's deeper than that.

To sort through this example requires thinking through the concept of love in a deeper way and distinguishing it from neediness and from a desire to mold the person according to an image. Part of loving someone, romantically or not, is seeing what that person is actually like, respecting his or her boundaries. To love someone, rather than just to love an image of that person, is to accept the person as he or she is. Loving the person is exactly what can *help* you see clearly who that person is and your relationship to him or her.

Emotions Give Us Data

There is another area in which emotions are essential to critical thinking. Emotions often give us data, and much of the time it's foolhardy to ignore that data. For example, if two people are in love, it is *unreasonable* for them to ignore that fact when they make important decisions about, say, whether to go to schools that are far apart. Being in love is directly relevant to that decision. Ignoring important data is *not* thinking critically. (For the same reason, it would also be unreasonable to base the decision *only* on the fact that they are in love. Other facts are relevant as well.)

In a more general way, though, we receive important data from our emotions all the time. Suppose that while walking through a

Describe some situations where, in your best judgment, your emotions led you astray in your reasoning.

Describe some situations where, in your best judgment, your emotions made a positive contribution to your reasoning.

Try to discover patterns in your emotional reactions, so you can assess when your emotions tend to be accurate responses to reality and when they tend not to be.

For example, think about the people you have been in love with in the past. Have they generally been caring, respectful people who, on the whole, treated you well? If so, that's a pretty good reason to rely on your feelings of love as an indicator of who is good for you: you're pretty good at picking good people. But if they were abusive or manipulative, that's a good reason not to let your feelings of being in love with someone guide you too strongly in your future choices.

neighborhood at dusk, you become afraid that you are in danger. Sometimes people have a narrow view of rationality. If they cannot pinpoint what is dangerous about the situation, they draw the conclusion that their fears are unfounded. But under most circumstances, that's not reasonable at all. There is a good chance that you are picking up clues you are not aware of, triggering your fear. There is nothing unreasonable about heeding that data. On the contrary, what is unreasonable is to pretend you are not afraid when you are. The reasonable thing to do is neither to ignore the data of your emotions nor to give them too much weight.

Being Logical Is Linked to Having Feelings

If we think of desires as intertwined with emotion, then the tie between critical thinking and emotions is even stronger. That is because, in the end, it is not possible to engage in critical thinking without desires and their attendant emotions. Unless I have goals—desires, things I want, things I'm emotionally attached to—I have no reason to think critically, no reason to take action X rather than action Y.

There was a character named Mr. Spock on the old *Star Trek* series. He said that he put aside whatever feelings he had in order to be what he called "logical." But in the series, he saves the ship and the crew again and again. The problem with this scenario is that if he is not emotionally attached to the crew members, he has no reason to save them. Unless he *wants* them to live, it is not "logical" for him to save them. Spock's answer is that saving the *Enterprise* is the "right thing to do." But, unless he's emotionally attached to doing the right thing, he has no reason to do the right thing either. The question is always: Why should he try to achieve *any* purpose? It is "logical" for him to do something only if achieving his purpose is something that matters to him, matters to him in terms of his emotions and desires. Being logical requires having goals that are emotionally important.

The relation between emotions and critical thinking is a complicated one, without easy solutions. (For example, not all philosophers would agree that emotions and desires underlie rationality.) There is no doubt that emotions can cloud judgment, but they can also illuminate it. Fear can make you run from a decision that is in your best interests. But fear can also alert you to dangers in decisions, dangers that you're not consciously aware of. Anger is often a very sophisticated emotion, alerting us to subtle evidence of people's intention to cross our boundaries. Whether to rely on emotions in any particular case, and how much to rely on them, is itself a matter for critical thinking.

Critical Thinking and Problem Solving

Critical Thinking Goes Beyond Problem Solving

Find some examples in your textbook or other course material of:

- problems that are meant to be solved
- problems that are meant to be addressed and reasoned through, but not solved
- questions or topics that (like "wellness") are too large to be classified as problems.

A lot of critical thinking consists of problem solving. You may want to research and figure out the major causes for the amount of violent crime in the United States, or wonder why there are so any earthquakes in California. On a personal level, you may want to improve your study skills or social life. You may map out a scenic route to drive from Denver to Toronto. These are all problems to be solved—or, if "solved" is too strong a word, they are problems to be addressed and figured out as well as possible.

Critical thinking, however, goes beyond problem solving. Some questions or situations are too big or too ill-formed to be classified as problems—still less as problems to be solved. Trying to decide whether to marry someone is one of the best examples of a critical-thinking question: there are few other decisions that affect people's long-range welfare more than this one does. But most of us would not classify that as "problem solving." Similarly, when a nurse gives a nursing diagnosis for a patient, that's problem solving. But nurses can also think critically about wellness: what it means at different age levels, how to promote it in an individual or a community. But wellness is not a problem; nor is it a problem to be solved.

Another way critical thinking goes beyond problem solving is in the realm of asking questions. Questions are a fundamental part of critical thinking, and one of the most difficult skills in critical thinking is learning to notice that there is a question you should be asking, a problem you should be solving. In problem solving, on the other hand, someone gives you the problem—and your job is to solve it. Critical thinking is different because it begins with posing the problem in the first place.

Impediments to Critical Thinking

The way we think is an adaptation to the surroundings we have lived in. The patterns in our thinking are ways we have developed to make sense of what goes on around us. These patterns can be effective, but they can also be dysfunctional. Most likely, for each of us, the patterns are variable: effective in some areas, wildly ineffective in others, and mixed most of the time.

Many aspects of the world we live in can be impediments to learning to think more critically.

Forming a Picture of the World on the Basis of the News

Most of us form a picture of what the world is like based on the news: TV news, newspapers, newsmagazines. Even if you don't watch the news or read newspapers much, you indirectly form a good deal of your picture of the world from the news. You get a picture of what the world is like by talking to friends, or listening to talk shows or watching MTV, or just through hearsay. But your friends and the people on MTV form their picture of the world from the news—and so indirectly you and I do too.

Here is a question I ask students in Louisiana. (You may not know much about Louisiana, but answer the question anyhow):

> Consider people who are convicted of murder in Louisiana, and sentenced to life imprisonment. How much time do such people, on the average, actually spend in prison? (Remember: the question is not how many years they are sentenced to; it is how many years they end up actually spending in prison.)

a. 0–5 years
b. 5–10 years
c. 10–20 years
d. 20–50 years
e. until they die.

Choose an answer before you read on.

I have asked thousands of students this question over the last few years or so; almost no one ever gets it right. Even with myself, it was hard to become convinced of the right answer. The first few times I heard it, I simply didn't believe it. (The answer is in the footnotes.[3])

Now, this is a purely factual question, not a critical-thinking one. But there is a critical-thinking question behind the mistaken answers. Where do we get our false impression? We get it, directly or indirectly, from the news media. But how? We do not get the wrong answer because the news *tells us* the wrong answer. News media are very careful to check the accuracy of factual statements they report.

Rather, the news media tell us *stories*. They report on someone getting released from prison early. Maybe over the course of time they report several such stories, including some where a criminal then

commits a violent crime while on parole. Maybe we hear politicians or relatives of a victim talking about how life means only twenty years, and we believe them. (These people too get their impression from the news.) These stories are vivid. They are simplified and made dramatic. Often there is stirring footage. They register in our minds. Whether we are aware of it or not, we form a general picture that violent criminals (including murderers sentenced to life in Louisiana) are getting out of prison early all the time.

Any picture like that one, formed on the basis of news presentations, is likely to be seriously distorted. This is because the news media report not on what is usual or typical, but on what is *unusual*. That's why it is called *news*: it reports on what is out of the ordinary. That's also why it works so well as entertainment. In contrast, what is usual is for people to wake up in the morning, eat breakfast, go to work, eat lunch, come home at the end of the day, watch TV for a while, go to bed. That is not a news event. Rather, what the news reports on is Iraq (hardly a typical country), a fire in an apartment complex (not a common event), an ax murder in Montana (maybe the only one to occur there in fifty years), a highly controversial bill in Congress (not the hundreds of bills that are passed regularly).

If you want an accurate picture of what the world is *usually* like, you need to look to reputable books, studies, or websites that deal with the subject in depth. Textbooks are usually an excellent source. And, of course, you have to do some intensive critical thinking about the topic as well.

This doesn't imply that it's wrong to consult the news media regularly. On the contrary, the news—especially if it has more in-depth coverage—is an excellent way to keep up with the unusual, even earthshaking, events of our time.

Discuss how likely you are to get a false picture of the following topics from the news:

- the danger of small airplanes
- the amount of crime in your area
- new findings in science
- the chances of winning the lottery

(*continued*)

(*Continued*)

Write down a few important topics of your own where your picture of the world is likely to be seriously distorted if you base your impression mainly on what is reported in the news. Where, specifically, would you look to get a more accurate impression?

In the discipline. Are there topics related to the discipline you are studying that appear from time to time in the news? Is the picture you receive from the media likely to be distorted? In what ways? Again, where specifically would you look to get a more accurate picture?

Forming a Picture of the World on the Basis of Movies, TV, Advertising, Magazines

If forming a picture of the world on the basis of the news results in distortion, forming a picture on the basis of fictionalized or sensationalized material results in vastly more distortion. Sometimes the distortion is obvious, at least to reflective adults: People do not get thrown through plate-glass windows and emerge intact; there is no reason to believe there are aliens among us; the clothes in the glossy picture will not make most of us look like the model in the picture; products often have unmentioned defects. Other examples are more subtle and affect our attitudes in deep and disturbing ways: Trying your hardest, though it may give you personal satisfaction, will not usually result in beating the competition (especially because they may be trying their hardest too); most people's grades (or height or intelligence or abilities) cannot be above average; everyone cannot be glamorous, young, physically attractive, or strong; being a lone-wolf rebel who can't get along with superiors does not usually bring success.

List some of the subtle messages acquired from movies, TV, magazines, or advertising that tend to give people a false sense of what the world is like. How about school in particular? How is high school or college usually depicted? How is the subject matter of your classes presented in these sources? Are there stereotypes?

All-or-Nothing Thinking (Black-and-White Thinking), Us-Versus-Them Thinking, Stereotyping

Each of these ways of thinking is deeply ingrained in us. Some biologists even think we have a built-in genetic bias in favor of thinking in these ways. Nevertheless, each stands in the way of critical thinking, and for similar reasons. Thinking in terms of concepts like these is a way of simplifying our world. In fact, each of them vastly oversimplifies the complexity of reality, and each serves as an excuse for not thinking things through.

Effective thinking requires us to pay attention to the complexity of things. It requires us to develop a tolerance for ambiguity and an acceptance of less-than-certain answers. It requires a commitment to seeing both sides of an issue and to trying to find out the truth, rather than merely trying to bolster our side: our country, our race, our gender, our political views.

Describe a situation—either from your own life or from disciplines you have studied—where you engaged in all-or-nothing thinking.

Then describe a contrasting situation, one where you were tempted to engage in all-or-nothing thinking, but instead addressed the subtleties of the situation and therefore came up with a more careful answer.

Describe a similar pair of contrasting examples for us-versus-them thinking, then for stereotyping.

Fears

Although, as we have seen, all fears are not automatically an impediment to critical thinking, some fears do tend to become obstacles. That's especially true of

- fear of making mistakes
- fear of trying something new, of sticking your neck out
- fear of looking foolish

The full exercise of critical thinking requires that you develop intellectual courage. For example, making mistakes is an essential part of critical thinking. What important skill have you ever learned that did not involve making many mistakes? Most critical-thinking experts believe you learn a great deal more from mistakes than from successes. In fact, though you may make fewer critical-thinking mistakes as your higher-order thinking skills develop, there will always be mistakes to be made and learned from.

The same will be true when you try new ways of thinking, when you risk looking foolish by exposing how you think about issues, and when you take the risk of giving original solutions to old problems.

Some Educational Practices Discourage Critical Thinking

Some prevalent educational practices discourage critical thinking, and internalizing them as a model of what education should be can seriously affect your critical thinking. These practices are based on assumptions like:

- The student's role is to be a passive recipient of knowledge.
- The student's role is to memorize and regurgitate information.
- The teacher's role is to dispense knowledge.
- Questions on exams should be taken only from what has been covered in class.
- Problems assigned to students should always be clearly formulated.
- There is an adequate answer to every question.
- Everything is just a matter of opinion.

How much of your past education has emphasized the teacher or student roles listed?

Formulate your idea of what education should be about, your philosophy of education.

Make some well-considered judgments about how the roles listed fit in with or oppose your idea of education.

Deeper, More Pervasive Impediments to Critical Thinking

In addition to the specific impediments listed previously, there are other, deeper and more pervasive obstacles to critical thinking. Four of them are briefly discussed next, but they are not separate from one another. All four are deeply interwoven. In addition, they are difficult impediments to come to terms with. Maybe it is fair to say that none of us ever completely overcomes them. We can, however, gain deeper insights into how they work, and that can help us overcome their influence.

Egocentrism

Each of us is at the center of our own experience. We live in the middle of our feelings, pains and pleasures, the things we want and the things we are afraid of, the experiences that have shaped our lives and our attitudes, whether we know it or not. Our experience is heavily influenced by how we think, and, conversely, how we think is influenced by our experience.

In accord with this, people often have a way of thinking that always puts themselves first. When they are engaged in such egocentric thinking, they tend to make judgments about how things are, but they may base those judgments on wishful thinking or mere self-interest. This occurs in all of us, probably a good deal of the time. Sometimes it's so blatant that, when it is pointed out to us, we easily see it. Most of the time, though, it operates far beneath the surface. It is easy to delude myself into believing that I am working in the best interests of humanity as a whole when in fact I am working for my own interests and even against the interests of humanity. This is always easier to see in other people than it is in myself.

Egocentrism interferes with critical thinking on all levels, from the deepest to the most superficial. It stands in the way of the empathy that is such an important part of critical thinking. If I am in the health-care professions, for example, it's easy to stay bound up in my own desires and needs and not see things from the patient's point of view. Egocentrism stands in the way of fair-mindedness too, another essential component of critical thinking. Part of thinking effectively is being able to understand points of view that are opposed to my own. Sometimes when I feel threatened, though, I can't even *hear* what the other person is saying. For many people, when someone critiques their country or culture or religion or family, all they hear is the *fact* that they are being criticized. Anger rises, and often they can't even repeat the substance of the comments the person made. This interferes with their ability to give a fair evaluation of their country, culture, and so on. If I can't hear a critique, then I can't come to a balanced conclusion, and that deprives me of information I can use to assess the validity of my beliefs.

Egocentrism makes it difficult for me to tell accurate from inaccurate statements. It leads me to misunderstand other people's motives as well as my own. It influences me to put incorrect interpretations on what people say.

In course work, egocentrism can lead to my seeing education only in terms of grades, in effect causing me to miss out on all the other benefits to be derived from education. It can lead to plagiarism and cheating, or thinking that teachers are unfair even if they're not.

One of the most valuable things to be gained from critical thinking is an ability to see the egocentricity of our own thinking.

Write a brief response to the following questions (your response can be just a few lines, but it is important that it be written):

1. Advertising. In your judgment, how heavily are people influenced by advertising?
2. Conformity. In your judgment, to what extent do people conform to roles dictated by the society they live in?
3. Driving. In your judgment, are people generally good drivers?

Write your responses before you look at the answers (see Exercise 1.3 at the end of the chapter).

Developmental Patterns of Thinking

We acquire many of our patterns of thinking as we go through different stages of psychological and physical development. As children, we have a number of deeply felt needs: a need to feel safe, a need to be loved,

Think about the need to feel safe. This is a need that develops in early childhood and never really goes away.

Begin by focusing on other people. Use obvious examples of persistent irrational behavior in people you know: maybe they are abrasive and drive friends away; maybe they identify with groups or with causes that don't seem to serve their interests; maybe they continue to hold beliefs when the vast preponderance of evidence goes against those beliefs. Now try out the hypothesis that this behavior is partly the result of looking for feelings of safety along paths established during childhood. (If I drive people away, for example, it can feel as though I don't have to take the risk of depending on them; identifying with groups can give me a feeling of belonging, of safety.)

A much harder exercise is to apply this not just to others, but also to yourself.

a need for physical contact; we have a need to individuate ourselves from others as well as a contrary need to join completely with another person. Moreover, many of our standard ways of thinking were acquired during childhood, even during early childhood. After all, that's when we first learned how to conceptualize and deal with emotions, frustration, authority figures, strong desires, pain, and hurt. Many of the strategies we devised back then still persist, beneath the surface, throughout our lives. Thus, when we feel threatened, we can easily revert back to a child's way of thinking. Problems that can be solved may seem overwhelming. (Think of how overwhelming problems can be to a child.) People can be going about their business with no reference to us at all, and we may feel victimized by it (e.g., waiters who don't see us at their table; drivers who go slow in the left lane; customers who have 20 items in the 15-item checkout lane). We might resort to manipulation or even physical bullying when we don't get our way. Psychologically, that makes sense from a child's relatively helpless point of view.

Those are reversions to childhood. But our thinking can also revert to early adolescence. That's especially true of our judgments about love, romance, and sexuality.

Both childhood and early adolescence, though, are very confusing times, when our critical-thinking abilities have not yet developed very much. If we continue to use those patterns of thinking, especially at important junctures in our lives, we can easily perpetuate the situations of the past. So, another great benefit of learning to think critically is that you can start identifying the *assumptions* you used to make about life, and you can distinguish them from the more mature assumptions you can make now. You can separate your past from your present *purposes*. You can take seriously the much more extensive *information* you have now, the *context* in which you now live, the *alternatives* that are now available to you that were not available when you were younger. You can draw different *conclusions*. (The italicized terms are essential critical-thinking concepts, elements of reasoning; see Chapter 2.)

Previous Commitments, Previous Personal Experience

Suppose someone makes a point about a controversial issue, about politics maybe, or capital punishment, or the benefits of a trade agreement. The most usual way to evaluate the person's statement is first to see how much it agrees with my views, and then give reasons for or against it based on the amount of agreement.

This might be reasonable if my views were the product of extensive critical examination on my part. But often my views are ones I just happen to hold; they only seem to be the result of previous

examination. There may be no reason to think that my previously held beliefs are more likely to be correct than the newer points I am evaluating for the first time.

We can also think in a biased way with respect to evidence. On the one hand, if I lean toward a certain belief, then just a small amount of evidence weighs heavily in its favor for me. If I believe in aliens visiting earth, or herbal remedies for cancer, or homeopathic cures, or predestination, then even the negative fact that such views have not been absolutely disproven counts heavily in their favor in my eyes.

On the other hand, if I oppose a belief, then a vague piece of evidence, or just the fact that it has not been absolutely proven, weighs heavily against it:

> "I don't believe in global warming. Nobody has *proved* the earth is getting warmer. Last winter it was very cold."
>
> "Smoking does not cause lung cancer: correlation is not the same thing as causation."
>
> "You can't prove that I won't win the lottery. There's always a chance. You can't win if you don't play."

That is, we slant the amount of evidence to fit in with our predispositions. We require a *mountain* of evidence to make us doubt something we already believe, but we require only the *slightest* of evidence to make us more sure of it. Even our own ingenuity can work against us. No matter how bizarre or farfetched a point of view is, if we become convinced that it is true, our ingenious minds can almost always construct at least *some* evidence in its favor.

How *should* we make judgments? If we are interested in accuracy, in knowing the truth or what is likely to come closest to the truth, we should go with the *preponderance of evidence*, regardless of whether we started out for or against a particular conclusion. That is often extremely difficult to do because decisions can be made below the level of our awareness and because our beliefs are so often bound up with our egos and developmental ways of thinking. We can increase our awareness and open-mindedness by using critical thinking.

This is also true when we are basing judgments on *personal experience*. Personal experience gives us a valuable supply of information, one that we can use to draw conclusions, make decisions. One of the main ways teachers get students to think critically about a discipline is by asking them to relate the discipline's concepts to their personal experiences. No one would deny the value of personal experience in critical thinking.

However, personal experience can also be an impediment to critical thinking. That's particularly true of vivid personal experiences,

the kind that are unusual and imprint themselves on our minds. For each of us, our personal experience is limited. If we make generalizations from it that go beyond what we are acquainted with, we stand a good chance of drawing distorted conclusions. Your own experience has far more impact on you than the experiences of a hundred other people you hear about. But, if you want to draw accurate conclusions about what is likely to happen, then (other things being equal) you should put more faith in the experiences of a hundred people than in the experience of one—even if that one happens to be you.

What do you need to do to broaden your knowledge base so as to take account of a wide variety of experiences and conclusions beyond your own? Look at reputable books, studies, journal articles, sources that gather and assemble information from a great variety of human experience. If you own a Toyota that repeatedly gives you trouble, that is an excellent reason not to trust that car in the future. But if you want to make a wise decision about whether the next car you buy should be a Toyota, your personal experience is too limited. It would be wiser to consult *Consumer Reports* or some other neutral agency that evaluates cars. The best-selling and highly influential book *Men Are from Mars, Women Are from Venus* draws conclusions about what men and women are really like—but the conclusions are based on the behavior of only a handful of American men and women who decided to go into therapy and consulted the author. That sample is so tiny and unrepresentative that when it is projected on to men and women in general, it's liable either to be inaccurate or to be seen as accurate only because it's a set of stereotypes. What should the author have done if he wanted to think critically about profound differences between men and women? At the very least, he needed to consult well-substantiated studies of men and women from a great variety of cultures, and he needed to research the behavior of people who have never consulted a therapist.

How Deep Is Our Need for Critical Thinking?

One of the great things about critical thinking is its versatility. It is valuable at all levels of our thinking.

At the Level of Practical Decision Making

Critical thinking helps when we are simply trying to deal with ordinary tasks: how to study more efficiently, find a strategy when we are stuck in an airport, decide what kind of clothes to buy. This is thinking about the means to use to accomplish our goals. It is problem solving of the most authentic kind. This is an important level

of critical thinking, one that addresses all those ordinary decisions we make.

Developing thinking skills helps you envision alternative paths you could take. It helps you identify and discard outdated assumptions you may be making. It helps you anticipate some of the consequences, both positive and negative, of decisions you or others may make. It helps you keep your goals in sight and think of more effective means of achieving those goals.

At the Level of Meaningfulness

Learning to think critically also helps people deal with the much larger issues of living their life. Critical thinking frees people, the way nothing else really can, from habits of thinking they are often ruled by. Not completely of course, but substantially. Critical thinking opens up other viable courses of action that leave people far more fulfilled, paths that otherwise might never occur to them. Finding a life partner or a new occupation; incorporating the profound knowledge that's available in your courses into your way of thinking about your life; developing reasonable attitudes toward self, toward others, toward your values, toward all the things that make life meaningful for you—all of these can be made richer and more attainable when you examine them thoughtfully.

At the Level of Concepts

We think in terms of concepts, and these inevitably shape our life to a considerable degree. Very often the concepts we think in terms of are ones we accept uncritically. We may understand what love is from movies and from the way we feel. We may understand what freedom is simply by having heard the word over and over and making vague associations with it. We may grow up thinking justice means getting even. We all have concepts of what it is to be a student, a teacher, a woman, a man, a religious person, an atheist, a scientist, an artist, a professional in the field we are studying. We have concepts of what it means to be brave, to be treated fairly, to be intelligent, to be cool, to be anything you can name or describe. We can reach a deep level of critical thinking by examining our concepts critically, becoming more aware of the way individual concepts help us or hurt us, limit us or free us.

Even aspects of ourselves that are distinct from thinking are heavily influenced by our concepts. Desires, for instance: If you like something, or hate it—a person, a movie, a subject in school, a kind of car—the liking or the hating is not itself an instance of thinking. Rather, the liking or hating is influenced by the concepts you use in

Many people automatically assume that bravery is good. But here are some possible examples where bravery makes a situation worse, where being brave does damage:

- someone who is brave but a Nazi
- a sports figure who bravely plays despite a serious injury
- criminals who bravely risk their lives in committing their crimes
- Achilles, the hero of *The Iliad*. Did his bravery accomplish what you would call worthwhile purposes?

Plato would say that these examples are not part of the concept of bravery at all. How might someone believe that?

In your view, are these examples of bravery or of something else? Why? If they are examples of bravery, would you admire the action in each case? Or would you say, "We would all be better off if these people were not brave"?

your thinking. It is only recently that anyone thought suntans were beautiful, that beaches were a desirable place to spend a vacation, that thinness in men and women was attractive, that wilderness held value, that toleration was a virtue, that democracy was workable, that it was unhealthy to be a caretaker in a relationship. Our standard concepts for each of these key terms has changed, becoming strikingly more positive or negative. The concepts may well change again. It can be liberating to step out of the fads that come and go with respect to what is desirable. Re-examining the concepts you have of the things you desire will help you rise above the fads.

Similarly, your concepts have an immense influence on what you are afraid of and what brings you joy. If you are afraid of the dark, afraid of math, or even afraid of dying—these are not universal fears. There are many people, not very different from you, who don't share these fears. Some people feel safe in the dark, delight in math (even if they are not very good at it), and find peace and acceptance in contemplating death. We fear things in part because of the *concepts* we have of those things, because of how we classify them and think about them.

The influence of our thinking extends even to bodily sensations: "Even though nerve signals work the same way, something as obviously biological as pain in childbirth is experienced differently depending on cultural expectations [that is, on concepts in our culture]. Women develop expectations not just about how they should respond but about how they should experience their own sensations and emotions."[4]

Emotions are not really under our direct control, though how we act on those emotions often is. Many of the ways people try to gain direct control over their emotions actually hurt. If you are afraid of speaking in public, for example, but feel you shouldn't be afraid of it, you can try to suppress the fear. Maybe you can even force yourself to speak in public, or pretend to yourself that you are not afraid of it. You can reason as follows: "It doesn't make sense to feel fearful of speaking in public. There's really nothing to be afraid of. Therefore, I am not afraid of speaking in public." This is called *denial*. Denial is when you keep yourself from seeing something you know is true. The classic case is alcoholics who refuse to see that they are alcoholics. Many people confuse denial of this sort with being rational. Neither suppression nor denial is very healthy. Neither is very effective either, at least not in the long run. Both have high psychological costs.

Though our emotions are not under our direct control, we can indirectly affect them by addressing our concepts. You can work on your concept of public speaking and try to understand why you see it as fearsome. You can admit and honor the fear that arises. You can investigate what its roots are, what associations you have with it that generate the fear, and build new associations. You can rethink the concept over time, and usually this will be effective in changing your reaction to it.

The Experience of Learning to Think Things Through

You may already be good at thinking critically. In some areas you may be very good at it. In fact, in some areas you may be so good at critical thinking that it occurs naturally—you no longer even recognize it as good thinking. For example, suppose you are driving down a street and a ball bounces out in front of you from between parked cars. You *instinctively* put your foot on the brake; you *instinctively* look around, searching for the child who might dart out. Another example: There's a sudden accident in the cars ahead of you. To get out of the way, you *instinctively* pull to the right rather than to the left.

These *seem* instinctive, but they're not. You've *learned* to do these things, and you haven't learned them as a conditioned reflex. You've learned them by reflection on likely consequences. You've internalized the critical thinking so well that it seems natural, instinctive. But these actions are still the product of critical thinking.

For many people, it is difficult to learn a new skill from a book. Think of learning how to drive a car, or dance ballet, or write. To acquire skills like these from scratch, it may be essential to have feedback: "Is this the way to parallel park?" "Should I position my feet like this?" But critical thinking is not that way, at least not entirely. You already have a lot of critical-thinking skills. It is an activity you already engage in, maybe to a significant degree. When it comes to skills you already have, reading a book can improve them dramatically. If you're able to write, drive, and dance, you can improve those skills by reading books that guide you through techniques. Of course, it's not enough *just* to read the book. You have to try it out, act on it, put it into practice. You have to do the writing, driving, dancing, *do* the critical thinking.

In fact, you can be confident that if you work your way through this book, your thinking skills will improve significantly. That is so because of the reflectiveness critical thinking requires. By working through this book, you will become more reflective, more aware of the dimensions of your thinking, and the skills will improve.

The trouble is, you may not *feel* as if your skills are improving. The improvement is not likely to be obvious. Many people have the opposite reaction. They feel they are getting worse at reasoning as they work through a course that emphasizes critical thinking.

That happens for a number of reasons. First, working through a disciplined process of critical thinking will slow your thinking down. A problem that you once effortlessly thought your way through will now take much longer. You will have to focus on all the parts of the thinking you previously took for granted.

Second, questions will start to arise for you where none arose before. "Am I being clear?" "Is this really an implication?" "Maybe I'm jumping to a conclusion here." "How can I check up on this?" Questions are a sign of growth, of opening to new ways of thinking. But we often believe that questions are a sign of *not* understanding, that it is better to have no questions at all. Critical thinking lives in questions.

Third, the reflectiveness of critical thinking can cause you to start second-guessing yourself, especially at the beginning, or when you are feeling down on yourself. Before, you might have confidently asserted an answer; now, however, you might reflect, "Wait a minute, maybe I'm jumping to a conclusion here," or, "Is this really an implication of this author's position? Maybe I'm being unduly influenced by the fact that I disagree with her."

Fourth, some of your certainty about things can be a bluff to cover up the threatening fact that you really don't know, or don't know for sure. The main person you are bluffing may be yourself. Studying how to think critically often calls your bluff. You start

asking, "What assumptions does my automatic response rest on?" Answers you might have given before with utter certainty now seem much shakier.

Finally, as Michael Scriven explained in a classic text on reasoning, if you are a swimmer or a tennis player and you start studying with a professional coach, you'll find that you have to change many of the ways you do things, unlearning certain moves and learning others. This will feel awkward, and it will slow you down—at first. But that slowing down is really the only way to build up proficiency and reliable speed. "Speed builds slowly."[5]

Here is a list of reactions many people have to studying critical thinking. You should not be surprised, or troubled, by experiencing many of them. (In fact, as a teacher I would be troubled if you experienced *none* of them.)

- difficulty applying critical-thinking terms in practice
- not being able to tell if you have applied them correctly
- becoming very concerned with how concepts overlap
- becoming confused about things that seemed clear before
- persistently doubting that you will ever improve
- having initial confidence in an answer, followed by nagging doubt
- feeling that your teachers are not teaching enough because they generate more questions than answers

When trying to learn to think critically, what's important is to engage in the *activities* of critical thinking, not just *read about* them. Unfortunately, many people have a model of thinking that does them disservice. They conceive of thinking as a solitary activity, something you do in the privacy of your own head.

But one of the best ways to learn to think things through, especially in a discipline, is with cooperative learning. Critical thinking is best when it is not done in a vacuum. It helps to have the give-and-take of discussion, to receive feedback on your thinking, to weigh other viewpoints, other approaches.

Getting Started: Clarifying with SEE-I

As we have seen, critical thinking begins with asking the questions you need to ask. Asking questions is a way of starting to get clearer: by formulating questions you are focusing your mind on what you need to address. In general, a good way to begin any critical-thinking process is by *clarifying*, by making things clearer.

A very useful process for clarifying almost anything is called SEE-I. This book contains many critical-thinking processes that

accomplish far more than you would ever expect at first glance, and SEE-I is one of them. The letters stand for four steps that help make whatever you are working on clearer:

S. State it
E. Elaborate (explain it more fully, in your own words)
E. Exemplify (give a good example)
I. Illustrate (give an illustration: maybe a metaphor, a simile, an analogy, a diagram, a concept map, etc.)

Statement

To **state** something is, essentially, to say it briefly, clearly, and as precisely as possible. Sometimes it means constructing a good definition, but it also includes, for instance, stating the thesis of a chapter by trying to capture the heart of what the chapter is saying in a single, clear, well-formulated sentence.

Elaboration

To **elaborate** on something is to expand on it, to explain it in your own words, at greater length, so the reader gets more of the fullness of what is meant. For instance, I can *state* the law of conservation of energy; I can then *elaborate* on it, explaining it in more depth, in greater detail, spelling out what it is saying. You can begin your elaboration by saying, "In other words, . . ."

Exemplification

Here, the goal is to give a good **example**—not just any example, but a well-chosen one, one that will clarify for yourself or for a reader what you mean. Usually, it should be your own original example, not one from the book or the teacher, and it should fit well with your statement and elaboration. Thus I might try to clarify the concept of *falling in love*: First I would try to **state** in a sentence what *falling in love* is; then I would **elaborate** on it; and then I would give a good **example** of falling in love, one that the reader can connect with. (Romeo and Juliet come to mind, but it could be a personal example as well.) You can begin your exemplification by saying, "For example, . . ."

Illustration

An illustration is literally a picture (as in "an illustrated book"). To clarify something, it helps to give readers something they can picture in their minds. Sometimes, it can be an actual picture (Figure 1.2 on page 39 of this book is a visual illustration of the process of critical thinking). In some cases it can also be a graph, a diagram, or a concept map. More usually, your illustration will be a picture in words: an analogy, simile, or metaphor that captures the meaning. For instance, Rush Cosgrove was clarifying the concept of *civil disobedience*. He stated his definition of it in a sentence; then he elaborated on it; and then he gave a good example of civil disobedience. (His example was Rosa Parks refusing to sit in the back of the bus.) Then he gave an **illustration**: He said that civil disobedience was like being a cliff at the edge of the ocean—the waves crash against it, but the cliff remains there. To me, that illustration captures vividly what Cosgrove means by *civil disobedience*. You can begin your illustration by saying, "It's like. . . ."

There are two aspects of clarifying something. The first is getting clear in your own mind; the second is communicating clearly to others, communicating so they understand you well. SEE-I works well for both of them. You can improve your writing in a major way by taking each main idea and developing it in your paper with an SEE-I. The result, with practice, can be a smooth flow of richly understood and well-communicated ideas. SEE-I can make both your thinking and your writing dramatically better. It is also a way of testing your understanding of what you learn (and is thus a valuable way to study for exams). If you can accurately S, E, E, then I a concept or a principle in a course, it means you almost certainly have a good grasp of it, that you understand it to a much greater degree than if you are merely able to state it. Similarly, SEE-I is a method your teacher may use to test your understanding, to assess how clear you are about concepts and issues in the course.

When students are assigned a five-page paper to write, they often have difficulty "filling up" the five pages (Teachers are often amazed by this because teachers usually have the opposite problem: they have difficulty "cutting down" what they want to say to five pages.) Using SEE-I gives you a way to "fill up" those pages—but without just adding filler. With every major point you are making in your paper, you can state it, elaborate on it, give examples, and top it off with an illustration that conveys the point. This will "fill up" your paper with writing that is clear and directly relevant to the development of your paper (see pp. 37–38).

The Flexibility of SEE-I

All of the critical-thinking processes in this book are flexible, adaptable. They can be shaped to a great variety of circumstances that call for critical thinking. Critical thinking is seldom simply a linear activity. That is so for SEE-I also: It is not a rigid process. For instance:

- Though the idea is to go step by step—*first* state, *then* elaborate, *then* give an example, *then* illustrate—you don't simply finish one step and then you're done with it. You will find that as you *elaborate*, you will often need to revise the *statement* you formulated in step 1. Similarly, both your example and your illustration may cause you to refine or even change your mind about the earlier steps.
- An ideal clarifying statement is a single, clear, well-formulated sentence. But in some cases it may take two. Similarly, you will usually elaborate in one or two paragraphs—but with complex ideas, more elaboration than that may be needed. The point is not really *how long*—the point is to capture the *essence* in a **statement**, and to explain it in its *fullness* in an **elaboration**.
- Sometimes you can skip the illustration step with very little loss. Often, though, a striking illustration will make the subject suddenly come into focus. It allows your creativity to come forward.
- In exemplification, you give an example. But sometimes what really clarifies the issue is to give both an example and a **contrasting example**. Thus, with civil disobedience, I can say that Rosa Parks is an example of it, but that cheating on my income tax to protest tax laws is *not* an example—it is doing something self-serving under the guise of civil disobedience. (Notice that the example might cause me to revise my statement of what civil disobedience is.)
- Much of the time, the statement-part of your SEE-I will be your own formulation, a definition or thesis statement that you yourself construct. But sometimes it is beneficial to take the statement step from some authoritative source, such as your teacher or the textbook. You then clarify your understanding of that statement in your elaboration, give a good example of your own, and an illustration that conveys it well. Thus an anatomy and physiology text gives a definition of "anatomy" as "the study of internal and external structures of the body and the physical relationships among body parts."[6] Writing out this statement does not, of course, show that I grasp what anatomy is, or how it is different from physiology. But I can clarify my understanding of it in my own mind, and convey that understanding accurately to a reader, by elaborating on that definition in a paragraph or two, by giving a good example of an anatomical structure (and maybe a contrasting example of a non-anatomical process), and by giving an apt illustration of anatomy.

SEE-I IN THIS BOOK

STATE

A **statement** of what *critical thinking* is can be found on pages 1–2. In fact, there are three statements of it there.

ELABORATE

Pages 3–4 are an **elaboration** of what *critical thinking* is. Pages 5–12 are another elaboration.

EXEMPLIFY

There are many **examples** of *critical thinking* in this book. One is on a reasonable way to deal with math anxiety on page 8; another is reasoning out the fairness issue on pages 10–11. More extended examples include Chris's analysis of marriage (pp. 75–79) and the analysis of the logic of earth sciences (pp. 100–101). Other examples will come from you: Any of the outcomes listed at the end of any chapter in this book are examples of critical thinking. Some **contrasting examples** (examples of *not* thinking critically) are also found throughout this book: for instance, the bulleted list on page 9. Examples of non-critical-thinking standards are listed on page 160.

ILLUSTRATE

There are several **illustrations** of critical thinking in this book. A picture of critical thinking is given on page 39; a visualization of thinking through the elements of reasoning is given on pages 39–40. But I could also say, as an illustration, that critical thinking is like a pair of binoculars: it allows you to get up close, explore detail, put what you see in context, and understand more of what you are seeing. That is an analogy. It is not an example of critical thinking; it is something that critical thinking is being compared to. Another illustration: when people give me a ride someplace in their car, or if I follow GPS

(*continued*)

SEE-I IN THIS BOOK (*Continued*)

instructions, even if I pay close attention I usually cannot get there on my own next time. If, however, I find my own way there, maybe using a map, I can almost effortlessly retrace my path every time. It stays with me indelibly. The illustration: critical thinking is like finding out your own way there.

Critical-Thinking Template

Here is a simple critical-thinking template, which can be applied in any area where you and others are trying to think things through.

- Find four or five other people who are also trying to think critically about this area. (This can be done in person or on-line.)
- Figure out the three most central organizing concepts or ideas that underlie the area. (For example, the three main concepts in a chapter you are studying for this course.)
- Begin with writing an SEE-I: State, elaborate, give an example of, and illustrate each of the three concepts.
- Next, write a paragraph or so explaining how the concepts fit together, how they operate in the world, in your life, in the subject matter. Duplicate both pieces of writing so that everyone has a copy. (It is important that your responses be written, even if they are just jotted down. Written responses are concrete and allow you to confront your thoughts in black and white.)
- Critique one another's thinking. (Remember that critiquing is not the same as criticizing or finding fault.) In the critique,

→ Focus on the elements from Chapter 2. Does the writer specify the purpose behind the concepts? Identify key assumptions? Look for consequences, for alternatives? and so on.

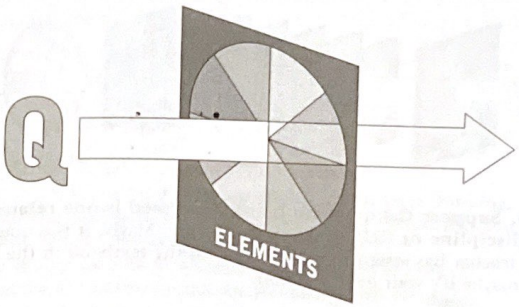
→ Focus on the standards from Chapter 4. Are the ideas clear? Are they accurate? Do they explain what is most important? and so on.

An Overview of the Book That Lies Ahead

Here is the basic model of this text, in a nutshell.

When people engage in critical thinking, they start off with some question. They try to answer it by reasoning their way through it.

FIGURE 1.1 *The process of reasoning.*



1. There are elements of reasoning. The elements are the basic building blocks of reasoning or thinking. *Assumption* is an element. When people reason things out, they make assumptions. So one way to examine their reasoning is to focus on that element of their reasoning: *assumption*. We can ask, "What assumptions are they making?" (The elements are explained in Chapter 2.)

So if the question is Q, we can picture the reasoning process thus far as shown in Figure 1.1.

2. There are also standards of reasoning. They can also be called "standards of critical thinking." These standards determine whether people are reasoning through the question well or not. *Accuracy* is an example of a standard. So one way to examine how well they have reasoned it out is to focus on that standard of reasoning: *accuracy*. We can ask, "Are the assumptions they have made accurate?" (The standards are explained in Chapter 4.) You can picture the standards as a set of filters (see Figure 1.2). They are used to filter out reasoning that doesn't meet the standards.

FIGURE 1.2 *The process of critical thinking: reasoning through the elements and standards.*

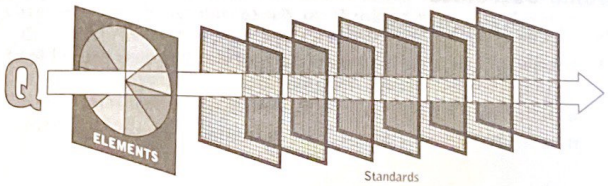
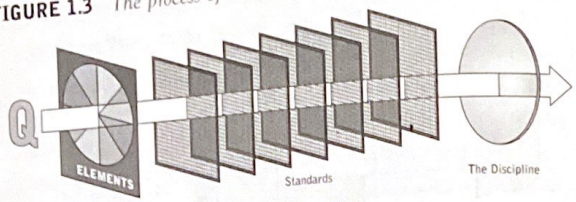


FIGURE 1.3 *The process of critical thinking in a discipline.*



3. Suppose the question being addressed is one related to the discipline or field you are studying. Maybe it is a question your teacher has assigned; maybe it's from the textbook in the subject; maybe it's your own question.

There are ways of thinking that lie at the heart of the discipline you are studying. These include fundamental and powerful concepts, and central questions of the discipline. Disciplines are not bits and pieces; they are not assemblages of facts. Instead, there is a logic to thinking in each discipline. For example, if the course you are taking is in sociology, then that logic, taken all together, constitutes the way a sociologist thinks. In biology, the goal is to think biologically, to think the way a biologist thinks. In history, the goal is to think historically.

The concepts differ from field to field. *Social patterns* is an example of a fundamental and powerful concept in sociology. So one way to examine how well people have reasoned out a question in the discipline of sociology is to focus on that fundamental and powerful concept: *social patterns*. We can ask, "Have they drawn conclusions, accurate conclusions, in terms of what we know about social patterns?" (Critical thinking in a discipline is explained in Chapter 3.)

You can picture the discipline as a lens or set of lenses through which people reason. Figure 1.3 gives us a full picture.

Some Outcomes

At the end of this chapter . . .

1. You should be able to run your finger slowly down the table of contents and identify the main concepts of Chapter 1:
   - reflective thinking; reasonable thinking
   - misconceptions about critical thinking
   - the role of emotions in critical thinking
   - impediments to thinking more critically
   - and so forth
2. With the book closed, you should be able to state, elaborate, exemplify, and illustrate each of these concepts, using examples from your own life, learning, and experiences. You should be able to give contrasting examples as well (e.g., of unreflective thinking, or of a mistaken idea of the role of emotions in critical thinking).
3. You should be asking more questions—about your thinking, about the discipline you are studying, about everything. You should also be reflecting more on your reasoning.
4. You should be able to identify which aspects of critical thinking are getting clearer for you and which are still unclear.

You should not expect to achieve the outcomes just listed in a way that is perfect. But you can expect to be improving in them, to find them increasing in your behavior. Not all of these will be directly observable by your teacher. You yourself may often not notice them. Changes in critical-thinking abilities are usually gradual and subtle.

Critical-Thinking Character Traits

In addition to the outcomes just discussed, you may notice some character traits changing in you. Here are two to reflect on:

- **Intellectual Courage.** Intellectual courage involves the willingness to face up to challenges to your settled beliefs and your habitual ways of thinking about things. Critical thinking will definitely challenge long-established ways of thinking you may have. Be alert to noticing that your intellectual courage is developing.
- **Confidence in Reason.** This describes the willingness to try to figure things out, to rely on thinking your way through things, to the best of your ability, rather than on all the other influences that shape your thinking without your knowing it. Both this book and the discipline you are studying rely on your commitment to use your best thinking to address questions.

CHAPTER 1 Exercises

Some of the questions in this and later chapters call for the straightforward application of concepts from the text, but some are more than that. Some ask you to extend concepts in the text to new areas and then to think critically about these extensions. Some of the exercises are designed to teach new concepts. Answering them is part of learning to think critically.

Starred exercises (*) are ones that have answers (or at least responses) at the back of the book. The responses there are not necessarily complete. Sometimes they are very sketchy. Often they simply point out one dimension it would be wise to consider when answering the question. Sometimes the starred response will contain additional questions as well.

1.1 What are some "good questions" you have about this course? Ask some good questions in each sense (ones that open up central areas and ones that you really want to know the answer to). What are some "bad questions" you could raise about the course (bad in the sense of superficial or bad in the sense that you don't really care about the answer)? Compare the questions you raise here with those you raised on page 8.

1.2 Thinking versus reflective thinking. You'll notice that many of the exercises in this book ask you to reflect: on aspects of the discipline you are studying, on your life, on your experiences in school, on your relation to the subject matter you are learning. Here is an example:

A. What should I do about this patient?
B. What should I do about this patient, keeping in mind that the purpose of this treatment is X?

In B, focusing on *purpose* helps make the thinking more reflective. Another example:

A. How should I study for my final exams?
B. How should I study for my final exams, keeping in mind the consequences (both positive and negative) of alternative ways of studying?

In B, thinking about *consequences* and *alternatives* helps make the thinking more reflective.

Write down three questions that you think about often. At least one should focus on the means to achieve a certain end. Then, formulate the questions reflectively, using the concept of *purpose, consequences, assumptions,* or *alternatives.*

1.3 Go back to the box on page 24 and look at the responses you gave about advertising, conformity, and driving.

Now turn the question to yourself: To what extent are *you* influenced by advertising? To what extent do *you* conform to roles dictated by society? Are *you* a better-than-average driver?

1.4 Raising central questions. Here are some "facts" or alleged facts. Formulate good questions about each. Explain why each is a good question.

a. The U.S. is #1.
b. Ninety-eight percent of the genetic material in humans and chimpanzees is identical.
c. "A child's drawing that expresses some feeling about mother, father and home is as much an artwork as Michelangelo's . . . Sistine Chapel frescoes."[7]
d. Smoking causes more deaths per year in the U.S. than alcohol, illegal drugs, murder, suicide, and AIDS all together.
e. "On Christmas Day 1991 a weary and bitter Gorbachev resigned as president of the USSR and recognized the Commonwealth of Independent States. The Soviet Union had dissolved."[8]

1.5 Review the definition of *denial* and the examples given there. (Here's another standard example: smokers who deny that smoking causes early death.) Identify three of your own examples of denial (they can be from your own life or someone else's). Explain how denial can appear "rational" to the person engaged in it.

1.6 A woman goes for a haircut at a national hair-cutting chain. The hairdresser asks her what brand of shampoo she uses. He then puts some of her hairs under a microscope and shows her there is a white film on the hairs. He recommends that she buy the salon's brand of shampoo rather than the one she has been using.

What would be some good questions for her to as herself about this situation?

1.7 **Group activity.** Individually write out some factors that you see as impediments to developing your own critical-thinking skills. Then prioritize the list, choosing that factor that is the greatest impediment for you.

Sit in groups of four. Person A begins, explaining how that factor is an impediment for him or her and giving a good example. Proceed through person B, C, and D in the same way.

Discuss the extent to which all four share the same impediments.

Then, the whole group should focus on Person A's impediment. Together, try to devise a practical strategy to counteract some of the influence that impediment has on critical thinking. Do the same for each group member.

1.8 Envision a prospective employer who might hire you after graduation. What are the most important understandings he or she would want you to have learned from your college education? How does this relate to critical thinking?

1.9 On page 2, you described a situation in which you thought through something critically and another in which you did not think through something critically.

For each, what criteria did you use to decide? That is, what earmarks of the first situation told you it was an example of good thinking? And what earmarks of the second situation told you that you did not think it through critically?

1.10 Look back at page 23, at the list of educational practices that the text says discourage critical thinking. Which of those practices seem "right" to you? That is, which of them seem to you to be a genuine way education should be? Why?

Then address this question: How could the practices listed actually get in the way of learning to think better within the discipline?

1.11 Name three things you have seen in movies that tend to give people a distorted view of the world. Discuss how they are misleading. Give an example of each.

Now, name three things you have seen in movies that have been seriously misleading for *you*. Explain briefly how they were misleading.

1.12 Give an example of a situation where your emotions led you in the wrong direction. Then give an example of a situation where your emotions led you in the right direction. In terms of critical thinking, how do you explain the difference?

1.13 It is one of those days when people seem to be driving erratically. Far more than usual, people are cutting you off, slamming on their brakes unexpectedly, or driving too slow. What are some good hypotheses to explain the way people are driving?

1.14 **In the discipline.** Look again at the impediments to critical thinking discussed in this chapter. (Eight major ones are listed.) Choose three and describe how they might be impediments for learning the discipline or subject matter of this course in a critical-thinking way.

1.15 You may notice some features of this book as you read. One is that it tends to use qualifier words a great deal; another is that it sometimes uses "I" in examples rather than "you" (e.g., on page 7). Can you see why, from a critical-thinking point of view, the book uses these features?

Are there other aspects of the way this text is written that seem to you unusual? Can you see any of them as responses to aspects of critical thinking?

1.16 The topic of Chapter 2 is the elements of reasoning. Three of those elements are *conclusions*, *assumptions*, and *points of view*. Think of a difficult situation in your life, a problem in your relationship with someone, a decision you have to make, or something important about this course. Formulate three good questions about that situation, using each of the three elements listed. Then answer the questions as well as you can.

1.17 Go deep: Look for a good example of how intellectual courage will be needed for you to think critically within the discipline you are studying, an example of when it will require courage for you to take ownership of some of the concepts or conclusions or points of view in the discipline. If you find a good example, describe it, including the role intellectual courage would play. If you can't find an example, write a paragraph considering the possibility that you are not taking the discipline seriously enough to believe the results.