### C HAPTER TWO: THE BASICS OF LOGICAL REASONING

#### The Logical Reasoning Section

The focus of this book is on the Logical Reasoning section of the LSAT, and each Logical Reasoning section contains a total of 24 to 26 questions. Since you have thirty-five minutes to complete the section, you have an average of approximately one minute and twenty-five seconds to complete each question. Of course, the amount of time you spend on each question will vary with the difficulty of each question and the total number of questions per section. For virtually all students the time constraint is a major obstacle, and as we progress through this book we will discuss time management techniques as well as time-saving techniques that you can employ within the section.

#### **The Section Directions**

Each Logical Reasoning section is prefaced by the following directions:

"The questions in this section are based on the reasoning contained in brief statements or passages. For some questions, more than one of the choices could conceivably answer the question. However, you are to choose the <u>best</u> answer; that is, the response that most accurately and completely answers the question. You should not make assumptions that are by commonsense standards implausible, superfluous, or incompatible with the passage. After you have chosen the best answer, blacken the corresponding space on your answer sheet."

Because these directions precede every Logical Reasoning section, you should familiarize yourself with them now. Once the LSAT begins, never waste time reading the directions for any section.

Let's examine these directions more closely. Consider the following sentences: "For some questions, more than one of the choices could conceivably answer the question. However, you are to choose the <u>best</u> answer; that is, the response that most accurately and completely answers the question." By stating up front that more than one answer choice could suffice to answer the question, the makers of the test compel you to read every single answer choice before making a selection. If you read only one or two answer choices and then decide you have the correct one, you could end up choosing an answer that has some merit but is not as good as a later answer. One of the test makers' favorite tricks is to place a highly attractive wrong answer choice immediately before the correct answer choice in the hopes that you will pick the wrong answer choice and then move to the next question without reading any of the other answers. On average, you have 1 minute and 25 seconds to complete each question.

Always read each of the five answer choices before deciding which answer is correct. Assumptions are a critical part of LSAT Logical Reasoning, and we will talk about assumptions in more detail in a later chapter.

Here's a good example of what they expect you to assume: when "television" is introduced in a stimulus, they expect you to know, among other things, what a TV show is, that TV can portray the make-believe or real, what actors do, and that TV is shown by beaming signals into TV sets in homes and elsewhere.

The question to the right, from the October 2003 LSAT, is presented for demonstration purposes only. The problem contains Formal Logic, which we will examine in great detail in a later chapter. For those of you who wish to try the problem now, the correct answer is listed in the first sidebar on the next page.

The other part of the directions that is interesting is the sentence that states, "You should not make assumptions that are by commonsense standards implausible, superfluous, or incompatible with the passage." The implication here is that you can make some assumptions when working with questions, but not other assumptions. Of course, Law Services does not hand a out a list of what constitutes a commensense assumption! Even outside of the LSAT, the test makers do not clearly state what assumptions are acceptable or unacceptable for you to make, mainly because such a list would be almost infinite. For LSAT purposes, approaching each question you can take as true any statement or idea that the average American would be expected to believe on the basis of generally known and accepted facts. For example, in a question you can assume that the sky sometimes becomes cloudy, but you cannot assume that sky is always cloudy (unless stated explicitly by the question). LSAT questions will not require you to make assumptions based on extreme ideas (such as that it always rains in Seattle) or ideas not in the general domain of knowledge (such as the per capita income of residents of France). Please note that this does not mean that the LSAT cannot set up scenarios where they discuss ideas that are extreme or outside the bounds of common knowledge. Within a Logical Reasoning question, the test makers can and do discuss complex or extreme ideas; in these cases, they will give you context for the situation by providing additional information. However, be careful about assuming something to be true )unless you believe it is a widely accepted fact or the test makers indicate you should believe it to be true). This last idea is one we will discuss in much more detail as we look at individual question types.

#### The Parts of a Logical Reasoning Question

Every Logical Reasoning question contains three separate parts: the stimulus, the question stem, and the five answer choices. The following diagram identifies each part:

1.	Mos seric all s over	t serious students are happy students, and most ous students go to graduate school. Furthermore, tudents who go to graduate school are worked.	Stimulus	
	Which one of the following can be properly inferred		Question S	Question Stem
	(A)	Most overworked students are happy students.		
	(B)	Some happy students are overworked.		
	(C)	All overworked students are serious students.	Answer Ch	nicas
	(D)	Some unhappy students go to graduate school.		.01005

(E) All serious students are overworked.

#### **Approaching The Questions**

When examining the three parts, students sometimes wonder about the best strategy for attacking a question: should I read the question stem first? Should I preview the five answer choices? The answer is Read the parts in the order given. That is, first read the stimulus, then read the question stem, and finally read each of the five answer choices. Although this may seem like a reasonable, even obvious, approach we mention it here because some LSAT texts advocate reading the question stem before reading the stimulus. We are certain that these texts are seriously mistaken, and here are a few reasons why:

- 1. Understanding the stimulus is the key to answering any question, and reading the question stem first tends to undermine the ability of students to fully comprehend the information in the stimulus. On easy questions this distraction tends not to have a significant negative impact, but on more difficult questions the student often is forced to read the stimulus twice in order to get full comprehension, thus wasting valuable time. Literally, by reading the question stem first, students are forced to juggle two things at once: the question stem and the information in the stimulus. That is a difficult task when under time pressure. The bottom line is that any viable strategy must be effective for questions at all difficulty levels, but when you read the question stem first you cannot perform optimally. True, the approach works with the easy questions, but those questions could have been answered correctly regardless of the approach used.
- 2. Reading the question stem first often wastes valuable time since the typical student will read the stem, then read the stimulus, and then read the stem again. Unfortunately, there simply is not enough time to read every question stem twice.
- 3. Some question stems refer to information given in the stimulus, or add new conditions to the stimulus information. Thus, reading the stem first is of little value and often confuses or distracts the student when he or she goes to read the stimulus.
- 4. On stimuli with two questions, reading one stem biases the reader to look for that specific information, possibly causing problems while doing the second question, and reading both stems before reading the stimulus wastes entirely too much time and leads to confusion.
- 5. For truly knowledgeable test takers there are situations that arise where the question stem is fairly predictable. One example—and there are others—is with a question type called Resolve the Paradox. Usually, when you read the stimulus that accompanies these questions, an obvious paradox or discrepancy is presented. Reading the question stem beforehand does not add anything to what you would have known just from reading the stimulus. In later chapters we will discuss this situation and others where you can predict the question stem with some success.

The correct answer to the problem on the previous page is answer choice (B). This is not an easy problem, but after you read through our chapter on Formal Logic this question will seem very reasonable.

In our experience, the vast majority of high-scoring LSAT takers read the stimulus first.

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6. Finally, we believe that one of the main principles underlying the read-thequestion-stem-first approach is flawed. Many advocates of the approach claim that it helps the test taker avoid the "harder" questions, such as Parallel Reasoning or Method of Reasoning. However, test data shows that questions of any type can be hard or easy. Some Method of Reasoning questions are phenomenally easy whereas some Method of Reasoning questions are extremely difficult. In short, the question stem is a poor indicator of difficulty because question difficulty is more directly related to the complexity of the stimulus and the corresponding answer choices.

Understandably, reading the question stem before the stimulus sounds like a good idea at first, but for the majority of students (especially those trying to score in the 160s and above), the approach is a hindrance, not a help. Solid test performance depends on your ability to quickly comprehend complex argumentation; do not make your task harder by reading the question stem first.

#### Analyzing the Stimulus

As you read the stimulus, initially focus on making a quick analysis of the topic under discussion. What area has the author chosen to write about? You will be more familiar with some topics than with others, but do not assume that everything you know "outside" of the stimulus regarding the topic is true and applies to the stimulus. For example, say you work in a real estate office and you come across an LSAT question about property sales. You can use your work experience and knowledge of real estate to help you better understand what the author is discussing, but do not assume that things will operate in the stimulus exactly as they do at your workplace. Perhaps property transactions in your state are different than those in other states, or perhaps protocols followed in your office differ from those elsewhere. In an LSAT question, look carefully at what the author says about the topic at hand; statements presented as facts on the LSAT can and do vary from what occurs in the "real world." This discrepancy between the "LSAT world" and the "real world" is one you must always be aware of: although the two worlds overlap, things in the LSAT world are often very different from what you expect. From our earlier discussion of commonsense assumptions we know that you can assume that basic, widely-held facts will hold true in the LSAT world, but by the same token, you cannot assume that specialized information that you have learned in the real world will hold true on the LSAT. We will discuss "outside information" in more detail when we discuss LSAT question types.

Next, make sure to read the entire stimulus very carefully. The makers of the LSAT have extraordinarily high expectations about the level of detail you should retain when you read a stimulus. Many questions will test your knowledge of small, seemingly nitpicky variations in phrasing, and reading carelessly is LSAT suicide. In many respects, the requirement forced upon you

Reading closely is a critical LSAT skill. to read carefully is what makes the time constraint so difficult to handle. Every test taker is placed at the nexus of two competing elements: the need for speed (caused by the timed element) and the need for patience (caused by the detailed reading requirement). How well you manage these two elements strongly determines how well you perform. Later in this chapter we will discuss how to practice using time elements, and near the end of the book we will discuss section management techniques.

Finally, analyze the structure of the stimulus: what pieces are present and how do those pieces relate to each other? In short, you are tasked with knowing as much as possible about the statements made by the author, and in order to do so, you must understand how the makers create LSAT arguments. We will discuss argumentation in more detail in a moment.

#### **Stimulus Topics**

The spectrum of topics covered by Logical Reasoning stimuli is quite broad. Previous stimuli topics have ranged from art to economics to medicine and science. According to the makers of the test, "the arguments are contained in short passages taken from a variety of sources, including letters to the editor, speeches, advertisements, newspaper articles and editorials, informal discussions and conversations, as well as articles in the humanities, the social sciences, and the natural sciences." Further, LSAT question topics "reflect a broad range of academic disciplines and are intended to give no advantage to candidates from a particular background."

Despite the previous statement, many LSAT students come from a humanities background and these test takers often worry about stimuli containing scientific or medical topics. Remember, the topic of a stimulus does not affect the underlying logical relationship of the argument parts. And, the LSAT will not assume that you know anything about advanced technical or scientific ideas. For example, while the LSAT may discuss mathematicians or the existence of a difficult problem in math, you will not be asked to make calculations nor will you be assumed to understand esoteric terminology. Any element beyond the domain of general public knowledge will be explained for you, as in the following example from the December 2003 LSAT:

Scientist: Isaac Newton's Principia, the seventeenth-century work that served as the cornerstone of physics for over two centuries, could at first be understood by only a handful of people, but a basic understanding of Newton's ideas eventually spread throughout the world. This shows that the barriers to communication between scientists...

The stimulus above, although reproduced only in part, is a good example of how the test makers will supply information they feel is essential to understanding the question. In this case, the reader is not expected to understand either the content or historical importance of Principia, and so the test makers conveniently furnish that information. Thus, although on occasion

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LSAT argumentation is one of the main topics of this book, and will be discussed in every chapter.

Some specific topics do recur, and we will note those in future chapters. you will see a stimulus that references an ominous looking word or idea (recent examples include superheated plasma and toxaphene), you will not need to know or be assumed to know anything more about those elements than what you are told by the test makers. When you read a science-based stimulus, focus on understanding the relationship of the ideas and do not be intimidated by the terminology used by the author. As we will ultimately find, reading an LSAT stimulus is about seeing past the topic to analyze the structural relationships present in the stimulus. Once you are able to see these relationships, the topic will become less important.

#### **Arguments versus Fact Sets**

LSAT stimuli fall into two distinct categories: those containing an argument and those that are just a set of facts. Logically speaking, an argument can be defined as a set of statements wherein one statement is claimed to follow from or be derived from the others. Consider the following short example of an argument:

All professors are ethical. Mason is a professor. So Mason is ethical.

The first two statements in this argument give the reasons (or "premises") for accepting the third statement, which is the conclusion of the argument.

Fact sets, on the other hand, are a collection of statements without a conclusion, as in the following example:

"The Jacksonville area has just over one million residents. The Cincinnati area has almost two million residents. The New York area has almost twenty million residents."

The three sentences above do not constitute an argument because no conclusion is present and an argument, by definition, requires a conclusion. The three sentences merely make a series of assertions without making a judgment. Notice that reading these sentences does not cause much of a reaction in most readers. Really, who cares about the city sizes? This lack of a strong reaction is often an indication that you are not reading an argument and are instead reading just a set of facts.

When reading Logical Reasoning stimuli, you should seek to make several key determinations, which we call the Logical Reasoning Primary Objectives<sup>™</sup>. Your first task is to determine if you are reading an argument or a fact set.

Primary Objective #1: Determine whether the stimulus contains an argument or if it is only a set of factual statements.

To achieve this objective, you must recognize whether a conclusion is present. Let us talk about how to do this next.

There are many books on logic and argumentation. In this book we attempt to concisely spell out what you need to know to succeed on the LSAT. This is different than philosophical logic, and therefore this section will not teach you argumentation as it is taught in a university.

Fact sets rarely cause a strong reaction in the reader because no persuasion is being used. When an author attempts to persuade you to believe a certain conclusion, there tends to be a noticeable reaction.

#### **Identifying Premises and Conclusions**

For LSAT purposes, a premise can be defined as:

"A fact, proposition, or statement from which a conclusion is made."

Premises support and explain the conclusion. Literally, the premises give the reasons why the conclusion should be accepted. To identify premises, ask yourself, "What reasons has the author used to persuade me? Why should I believe this argument? What evidence exists?"

A conclusion can be defined as:

"A statement or judgment that follows from one or more reasons."

Conclusions, as summary statements, are supposed to be drawn from and rest on the premises. To identify conclusions, ask yourself, "What is the author driving at? What does the author want me to believe? What point follows from the others?"

Because language is the test maker's weapon of choice, you must learn to recognize the words that indicate when a premise or conclusion is present. In expressing arguments, authors often use the following words or phrases to introduce premises and conclusions:

Premise Indicators	Conclusion Indicators		
because	thus		
since	therefore		
for	hence		
for example	consequently		
for the reason that	as a result		
in that	SO		
given that	accordingly		
as indicated by	clearly		
due to	must be that		
owing to	shows that		
this can be seen from	conclude that		
we know this by	follows that		
-	for this reason		

Because there are so many variations in the English language, these lists cannot be comprehensive, but they do capture many of the premise and conclusion indicators used by LSAT authors. As for frequency of appearance, the top two words in each list are used more than any of the other words in the list.

When you are reading, always be aware of the presence of the words listed

A premise gives a reason why something should be believed.

A conclusion is the point the author tries to prove by using another statement.

Make sure to memorize these word lists. Recognizing argument elements is critical!

Arguments can contain more than one premise and one conclusion. above. These words are like road signs; they tell you what is coming next. Consider the following example:

Humans cannot live on Venus because the surface temperature is too high.

As you read the first portion of the sentence, "Humans cannot live on Venus," you cannot be sure if you are reading a premise or conclusion. But, as soon as you see the word "because"—a premise indicator—you know that a premise will follow, and at that point you know that the first portion of the sentence is a conclusion. In the argument above, the author wants you to believe that humans cannot live on Venus, and the reason is that the surface temperature is too high.

In our daily lives, we make and hear many arguments. However, unlike on the LSAT, the majority of these arguments occur in the form of conversations (and when we say "argument," we do not mean a fight!). Any LSAT argument can be seen as an artificial conversation, even the basic example above:

Author: "Humans cannot live on Venus." Respondent: "Really? Why is that?" Author: "The surface temperature of Venus is too high."

If at first you struggle to identify the pieces of an argument, you can always resort to thinking about the argument as an artificial conversation and that may assist you in locating the conclusion.

Here are more examples of premise and conclusion indicators in use:

1. "The economy is in tatters. Therefore, we must end this war."

"Therefore" introduces a conclusion; the first sentence is a premise.

2. "We must reduce our budget due to the significant cost overruns we experienced during production."

"due to" introduces a premise; "We must reduce our budget" is the conclusion.

3. "Fraud has cost the insurance industry millions of dollars in lost revenue. Thus, congress will pass a stricter fraud control bill since the insurance industry has one of the most powerful lobbies."

> This argument contains two premises: the first premise is the first sentence and the second premise follows the word "since" in the second sentence; the conclusion is "congress will pass a

About 75% of LSAT stimuli contain arguments. The remainder are fact sets.

Important note: premises and conclusions can be constructed without indicator words present. stricter fraud control bill."

Notice that premises and conclusions can be presented in any order—the conclusion can be first or last, and the relationship between the premises and the conclusion remains the same regardless of the order of presentation. For example, if the order of the premise(s) and conclusion was switched in any of the examples above, the logical structure of the argument would not change.

Also notable is that the premises and the conclusion can appear in the same sentence, or be separated out into multiple sentences. Whether the ideas are together or separated has no effect on the logical structure of the argument.

If a conclusion is present, you must identify the conclusion prior to proceeding on to the question stem. Often, the reason students miss questions is because they have failed to fully and accurately identify the conclusion of the argument.

Primary Objective #2: If the stimulus contains an argument, identify the conclusion of the argument. If the stimulus contains a fact set, examine each fact.

#### **One Confusing Form**

Because the job of the test makers is to determine how well you can interpret information, they will sometimes arrange premise and conclusion indicators in a way that is designed to be confusing. One of their favorite forms places a conclusion indicator and premise indicator back-to-back, separated by a comma, as in the following examples:

"Therefore, since..." "Thus, because..." "Hence, due to..."

A quick glance would seemingly indicate that what will follow is both a premise and a conclusion. In this instance, however, the presence of the comma creates a clause that, due to the premise indicator, contains a premise. The end of that premise clause will be closed with a second comma, and then what follows will be the conclusion, as in the following:

"Therefore, since higher debt has forced consumers to lower their savings, banks now have less money to loan."

"Higher debt has forced consumers to lower their savings" is the premise; "banks now have less money to loan" is the conclusion. So, in this instance "therefore" still introduces a conclusion, but the appearance of the conclusion is interrupted by a clause that contains a premise. Order of presentation has no effect on the logical structure of the argument. The conclusion can appear at the beginning, the middle, or the end of the argument.

Remember, a fact set does *not* contain a conclusion; an argument must contain a conclusion.

This form is called the "conclusion/ premise indicator form."

#### Premise and Conclusion Recognition Mini-Drill

Each of the following problems contains a short argument. For each argument, identify the conclusion and the premise(s). Answers on the next page.

- 1. "Given that the price of steel is rising, we will no longer be able to offer discounts on our car parts."
- 2. "The political situation in Somalia is unstable owing to the ability of individual warlords to maintain powerful armed forces."
- 3. "Since we need to have many different interests to sustain us, the scientists' belief must be incorrect."
- 4. "So, as indicated by the newly released data, we should push forward with our efforts to recolonize the forest with snowy tree crickets."
- 5. "Television has a harmful effect on society. This can be seen from the poor school performance of children who watch significant amounts of television and from the fact that children who watch more than six hours of television a day tend to read less than non-television watching children."
- 6. "The rapid diminishment of the ecosystem of the Amazon threatens the entire planet. Consequently, we must take immediate steps to convince the Brazilian government that planned development projects need to be curtailed for the simple reason that these development projects will greatly accelerate the loss of currently protected land."

#### Premise and Conclusion Recognition Mini-Drill Answer Key

- 1. Features the premise indicator "given that."
  - Premise: "Given that the price of steel is rising,"

Conclusion: "we will no longer be able to offer discounts on our car parts."

- 2. Features the premise indicator "owing to."
  Premise: "owing to the ability of individual warlords to maintain powerful armed forces."
  Conclusion: "The political situation in Somalia is unstable"
- 3. Features the premise indicator "since."

Premise: "Since we need to have many different interests to sustain us,"

Conclusion: "the scientists' belief must be incorrect."

- 4. Features the conclusion/premise form indicator "So, as indicated by." Premise: "as indicated by the newly released data" Conclusion: "we should push forward with our efforts to recolonize the forest with snowy tree crickets."
- 5. Features the premise indicator "this can be seen from." The second sentence contains two premises.

Premise 1: "This can be seen from the poor school performance of children who watch significant amounts of television"

Premise 2: "and from fact that children who watch more than six hours of television a day tend to read less than non-television watching children."

Conclusion: "Television has a harmful effect on society." Note how this sentence does not contain a conclusion indicator. Yet, we can determine that this is the conclusion because the other sentence contains two premises.

- 6. Features the conclusion indicator "consequently" and the premise indicator "for the simple reason that." There are also two premises present.
  - Premise 1: "The rapid diminishment of the ecosystem of the Amazon threatens the entire planet."
  - Premise 2: "for the simple reason that these development projects will greatly accelerate the loss of currently protected land."
  - Conclusion: "we must take immediate steps to convince the Brazilian government that planned development projects need to be curtailed"

#### **Additional Premise Indicators**

Aside from previously listed premise and conclusions indicators, there are other argument indicator words you should learn to recognize. First, in argument forms, sometimes the author will make an argument and then for good measure add another premise that supports the conclusion but is sometimes non-essential to the conclusion. These are known as additional premises:

Additional Premise Indicators

Furthermore Moreover Besides In addition What's more

Following are two examples of additional premise indicators in use:

1. "Every professor at Fillmore University teaches exactly one class per semester. Fillmore's Professor Jackson, therefore, is teaching exactly one class this semester. Moreover, I heard Professor Jackson say she was teaching only a single class."

> The first sentence is a premise. The second sentence contains the conclusion indicator "therefore" and is the conclusion of the argument. The first sentence is the main proof offered by the author for the conclusion. The third sentence begins with the additional premise indicator "moreover." The premise in this sentence is non-essential to the argument, but provides additional proof for the conclusion and could be, if needed, used to help prove the conclusion separately (this would occur if an objection was raised to the first premise).

2. "The city council ought to ease restrictions on outdoor advertising because the city's economy is currently in a slump. Furthermore, the city should not place restrictions on forms of speech such as advertising."

The first sentence contains both the conclusion of the argument and the main premise of the argument (introduced by the premise indicator "because"). The last sentence contains the additional premise indicator "furthermore." As with the previous example, the additional premise in this sentence is non-essential to the argument but provides additional proof for the conclusion.

Additional premises are still, of course, premises. They may be central to the argument or they may be secondary. To determine the importance of the premise, examine the remainder of the argument.

#### **Counter-premise Indicators**

When creating an argument, an author will sometimes bring up a counterpremise—a premise that actually contains an idea that is counter to the argument. At first glance, this might seem like an odd thing for an author to do. But by raising the counter-premise and then addressing the complaint in a direct fashion, the author can minimize the damage that would done by the objection if it was raised elsewhere.

Counter-premises can also be ideas that compare and contrast with the argument, or work against a previously raised point. In this sense, the general counter-premise concept discusses an idea that is in some way different from another part of the argument.

Counter-premise Indicators

But Yet However On the other hand Admittedly In contrast Although Even though Still Whereas In spite of Despite After all

Following is an example of a counter-premise indicator in use:

 "The United States prison population is the world's largest and consequently we must take steps to reduce crime in this country. Although other countries have higher rates of incarceration, their statistics have no bearing on the dilemma we currently face."

> The first sentence contains a premise and the conclusion (which is introduced by the conclusion indicator "consequently"). The third sentence offers up a counter-premise as indicated by the word "although."

Counterpremises, also called adversatives, bring up points of opposition or comparison.

#### Additional Premise and Counter-Premise Recognition Mini-Drill

Each of the following problems contains a short argument. For each argument, identify the conclusion, the premise(s), and any additional premises or counter-premises. Answers on the next page.

1. Wine is made by crushing grapes and eventually separating the juice from the grape skins. However, the separated juice contains impurities and many wineries do not filter the juice. These wineries claim the unfiltered juice ultimately produces a more flavorful and intense wine. Since these wine makers are experts, we should trust their judgment and not shy away from unfiltered wine.

2. Phenylketonurics are people who cannot metabolize the amino acid phenylalanine. There are dangers associated with phenylketonuria, and products containing phenylalanine must carry a warning label that states, "Phenylketonurics: contains phenylalanine." In addition, all children in developed societies receive a phenylketonuria test at birth. Hence, at the moment, we are doing as much as possible to protect against this condition.

3. During last night's robbery, the thief was unable to open the safe. Thus, last night's robbery was unsuccessful despite the fact that the thief stole several documents. After all, nothing in those documents was as valuable as the money in the safe.

## Additional Premise and Counter-Premise Recognition Mini-Drill Answer Key

1. Features the counter-premise indicator "however" and the premise indicator "since."

Premise: "Wine is made by crushing grapes and eventually separating the juice from the grape skins."
Counter-premise: "However, the separated juice contains impurities and many wineries do not filter the juice."
Premise: "These wineries claim the unfiltered juice ultimately produces a more flavorful and intense wine."
Premise: "Since these wine makers are experts,"
Conclusion: "we should trust their judgment and not shy away from unfiltered wine."

2. Features the additional premise indicator "in addition" and the conclusion indicator "hence." In this problem the additional premise is central to supporting the conclusion.

Premise: "Phenylketonurics are people who cannot metabolize the amino acid phenylalanine."

- Premise: "There are dangers associated with phenylketonuria, and products containing phenylalanine must carry a warning label that states, 'Phenylketonurics: contains phenylalanine.'"
- Additional Premise: "In addition, all children in developed societies received a phenylketonuria test at birth."

Conclusion: "Hence, at the moment, we are doing as much as possible to protect against this condition."

- 3. Features the counter-premise indicator "despite"; the additional premise indicator "after all"; and the conclusion indicator "thus." The additional premise serves to downplay the counter-premise.
  - Premise: "During last night's robbery, the thief was unable to open the safe."
  - Counter-premise: "despite the fact that the thief stole several documents."
  - Additional Premise: "After all, nothing in those documents was as valuable as the money in the safe."

Conclusion: "Thus, last night's robbery was unsuccessful "

#### **Recognizing Conclusions Without Indicators**

Many of the arguments we have encountered up until this point have had conclusion indicators to help you recognize the conclusion. And, many of the arguments you will see on the LSAT will also have conclusion indicators. But you will encounter arguments that do not contain conclusion indicators. Following is an example:

The best way of eliminating traffic congestion will not be easily found. There are so many competing possibilities that it will take millions of dollars to study every option, and implementation of most options carries an exorbitant price tag.

An argument such as the above can be difficult to analyze because no indicator words are present. How then, would you go about determining if a conclusion is present, and if so, how would you identify that conclusion? Fortunately, there is a fairly simple trick that can be used to handle this situation, and any situation where you are uncertain of the conclusion (even those with multiple conclusions, as will be discussed next).

Aside from the questions you can use to identify premises and conclusions (described earlier in this chapter), the easiest way to determine the conclusion in an argument is to use the Conclusion Identification Method<sup>TM</sup>:

Take the statements under consideration for the conclusion and place them in an arrangement that forces one to be the conclusion and the other(s) to be the premise(s). Use premise and conclusion indicators to achieve this end. Once the pieces are arranged, determine if the arrangement makes logical sense. If so, you have made the correct identification. If not, reverse the arrangement and examine the relationship again. Continue until you find an arrangement that is logical.

Let us apply this method to the argument at the top of this page. For our first arrangement we will make the first sentence the premise and the second sentence the conclusion, and supply indicators (in italics):

Because the best way of eliminating traffic congestion will not be easily found, we can conclude that there are so many competing possibilities that it will take millions of dollars to study every option, and implementation of most options carries an exorbitant price tag.

Does that sound right? No. Let us try again, this time making the first sentence the conclusion and the second sentence the premise:

Because there are so many competing possibilities that it will take millions of dollars to study every option, and implementation of most options carries an exorbitant price tag, we can conclude that the best

Law Services says you are expected to possess, in their words, "a college-level understanding of widely used concepts such as argument, premise, assumption, and conclusion." way of eliminating traffic congestion will not be easily found.

Clearly, the second arrangement is far superior because it makes sense. In most cases when you have the conclusion and premise backward, the arrangement will be confusing. The correct arrangement always sounds more logical.

#### **Complex Arguments**

Up until this point, we have only discussed simple arguments. Simple arguments contain a single conclusion. While many of the arguments that appear on the LSAT are simple arguments, there are also a fair number of complex arguments. Complex arguments contain more than one conclusion. In these instances, one of the conclusions is the main conclusion, and the other conclusions are subsidiary conclusions (also known as sub-conclusions).

While complex argumentation may sound daunting at first, you make and encounter complex argumentation every day in your life. In basic terms, a complex argument makes an initial conclusion based on a premise. The author then uses that conclusion as the foundation (or premise) for another conclusion, thus building a chain with several levels. Let us take a look at the two types of arguments in diagram form:

In abstract terms, a simple argument appears as follows:

Conclusion Premise

As discussed previously, the premise supports the conclusion, hence the arrow from the premise to the conclusion. By comparison, a complex argument takes an initial conclusion and then uses it as a premise for another conclusion:



Thus, a statement can be both a conclusion for one argument and a premise for another. In this sense, a complex argument can appear somewhat like a ladder, where each level or "rung" is used to build the next level. Given enough time you could build an argument with hundreds of levels. On the LSAT, however, A simple argument does not mean that the argument is easy to understand! Simple in this context means that the argument contains only a single conclusion. there are typically three or four levels at most. Let us look at an example of a complex argument:

Because the Vikings have the best wide receiver in football, they therefore have the best offense in football. Because they have the best offense in football, they will win the Super Bowl next year.

In this argument, the first sentence contains a premise followed by a conclusion. This initial conclusion is then used in the second sentence as a premise to make a larger conclusion:

Premise: "Because the Vikings have the best wide receiver in football," Sub-Conclusion (conclusion of the previous premise/Premise for the following conclusion): "they therefore have the best offense in football." Main Conclusion: "they will win the Super Bowl next year."

As we will see in Chapter Twelve while discussing Method of Reasoning questions, one of the most commonly used complex argument forms is to place the main conclusion in the first sentence of the argument, and then to place the sub-conclusion in the last sentence of the argument, preceded by a conclusion indicator. This form is quite useful since it tends to trick students into thinking the last sentence is the main conclusion.

Another form of complex argumentation occurs with two-speaker stimuli. In these questions, two separate speakers are identified, and each presents his or her own argument or comment. Here is an example from the June 2003 LSAT:

Anne: Halley's Comet, now in a part of its orbit relatively far from the Sun, recently flared brightly enough to be seen by telescope. No comet has ever been observed to flare so far from the Sun before, so such a flare must be highly unusual.

Sue: Nonsense. Usually no one bothers to try to observe comets when they are so far from the Sun. This flare was observed only because an observatory was tracking Halley's Comet very carefully.

In the argument above, each speaker presents premises and a conclusion. As often occurs with this form of question, the two speakers disagree.

One of the benefits of a two-speaker stimulus is that the test makers can introduce multiple viewpoints on the same subject. As you might imagine, the presence of multiple viewpoints tends to be confusing, and the extra viewpoints offer the test makers the opportunity to ask a wider variety of questions.

The makers of the LSAT love to use complex argumentation because the presence of multiple conclusions tends to confuse students, making attractive wrong answer choices easier to create.

#### **A Commonly Used Construction**

Even within a single-speaker stimulus the test makers can raise alternate viewpoints. One of the most frequently used constructions is to raise a viewpoint at the beginning of the stimulus and then disagree with it immediately thereafter. This efficiently raises two opposing views in a very short paragraph. These stimuli are recognizable because they often begin with the phrase, "Some people claim..." or one of the many variations on this theme, including but not limited to the following:

"Some people propose..." "Many people believe..." "Some argue that..." or "Some people argue that..." "Some critics claim..." "Some critics maintain..." "Some scientists believe...

The structure of this opening sentence is remarkably consistent in form, and adheres to the following formula:

A number (some, many, etc.) of people (critics, students, teachers, legislators, vegetarians, psychologists etc.) believe (claim, propose, argue, etc.) that...

Of course, there are exceptions, as with these opening sentences from previous LSATs:

"Although some people claim"	(starts with "although")
"It has been claimed that"	(drops the number and people)
"Cigarette companies claim that"	(drops the number)

The author can also break up the idea, by inserting contextual information, as in the following example:

"Some critics of space exploration programs claim that..."

The use of this device to begin a stimulus almost always leads to the introduction of the opposing view, as in the following partial stimulus from the October 2003 LSAT:

Editorialist: Some people propose that, to raise revenues and encourage conservation, our country's taxes on oil, gasoline, and coal should be increased. Such a tax, however, would do more harm than good. The editorialist uses the "Some people propose" device to introduce one opinion of taxes and then in the following sentence counters the idea with the view that turns out to be the editorialist's main point ("Such a tax, however..."). The remainder of the problem went on to explain the reasoning behind the editorialist's view.

Given the frequency with which this construction appears at the beginning of stimuli, you should learn to begin recognizing it now. We will again discuss this device in the Main Point section.

#### Truth versus Validity

So far, we have only identified the parts that are used to construct arguments. We have not made an analysis of the reasonableness or soundness of an argument. But, before moving on to argument analysis, you must be able to distinguish between two commonly confused concepts: validity and truth.

When we evaluate LSAT arguments, we are primarily concerned with validity. That is, what is the logical relationship of the pieces of the argument and how well do the premises, if accepted, prove the conclusion? We are less concerned with the absolute, real world truthfulness of either the premises or the conclusion. Some students will at first try to analyze every single LSAT statement on the basis of whether it is an absolutely true statement (does it happen as stated in the real world). For the most part, that is wasted effort. LSAT Logical Reasoning is primarily focused on whether the conclusion follows logically from a set of given premises. In many cases, the LSAT makers will let you work under a framework where the premises are simply accepted as factually accurate, and then you must focus solely on the method used to reach the conclusion. In a sense this could be called relative truthfulness—you are only concerned about whether the conclusion is true relative to the premises, not whether the conclusion is true in an absolute, real world sense. This is obviously a critical point, and one we will analyze later as we discuss different question types.

#### **Argument Analysis**

Once you have determined that an argument is present and you have identified the conclusion, you must determine if the argument is a good one or a bad one. This leads to the third Primary Objective:

Primary Objective #3: If the stimulus contains an argument, determine whether the argument is strong or weak.

To determine the strength of the argument, consider the relationship between the premises and the conclusion—do the premises strongly suggest that the conclusion would be true? Does the conclusion feel like an inevitable result of

Logicians spend a great deal of time discussing validity and truth, even going so far as to create complex truth tables that analyze the validity of arguments. We are not concerned with such methods because they do not apply to the LSAT.

In logic, the terms "strong/ weak," "good/ bad," "valid/ invalid," and "sound/unsound" are used to evaluate arguments. For our purposes, "strong," "good," "valid," and "sound" will be interchangeable and all terms refer to the logical structure of the argument. The same holds true for "weak," "bad," "invalid," and "unsound."

the premises? Or does the conclusion seem to go beyond the scope of the information in the premises? How persuasive does the argument seem to you? When evaluating argument validity, the question you must always ask yourself is: Do the given facts support the conclusion?

To better understand this concept we will examine two sample arguments. The following argument uses the fact set we used before, with the addition of a conclusion:

"The Jacksonville area has just over one million residents. Cincinnati has almost two million residents. The New York area has almost twenty million residents. Therefore, we should move to Jacksonville."

The last sentence contains the conclusion, and makes this an argument. Notice how the presence of the conclusion causes you to react more strongly to the stimulus. Now, instead of just reading a set of cold facts, you are forced to consider whether the premises have proven the given conclusion. In this case the author asks you to accept that a move to Jacksonville is in order based on the population of the city. Do you think the author has proven this point?

When considering the above argument, most people simply accept the premises as factually accurate. There is nothing wrong with this (and indeed in the real world they are true). As mentioned moments ago, in LSAT argumentation the makers of the test largely allow authors to put forth their premises unchallenged. The test makers are far more concerned about whether those premises lead to the conclusion presented. In the argument above, there is no reason to doubt the accuracy of the premises, but even if we accept the premises as accurate, we still do not have to accept the conclusion.

Most people reading the argument above would agree that the conclusion is weak. Even though the premises are perfectly acceptable, by themselves they do not prove that "we should move to Jacksonville." The typical reader will experience a host of reactions to the conclusion: Why Jacksonville—why not a city that is even smaller? What is so important about population? What about considerations other than population size? Because questions of this nature point to flaws in the argument, we would classify the argument as a poor one. That is, the premises do not prove the conclusion. As shown by this example, the acceptability of the premises does not automatically make the conclusion acceptable. The reverse is also true—the acceptability of the conclusion does not automatically make the premises acceptable.

The following is an example of a strong argument:

"Trees that shed their foliage annually are deciduous trees. Black Oak trees shed their leaves every year. Therefore, Black Oak trees are deciduous."

An argument can be valid without being true. For example, the following has a valid argument structure but is not "true" in a real world sense:

"All birds can fly. An ostrich is a bird. Therefore, an ostrich can fly."

Questions such as the ones in posed in this paragraph suggest that the author has made unwarranted assumptions while constructing the argument. We will discuss assumptions in more detail later. In this argument, the two premises lead directly to the conclusion. Unlike the previous argument, the author's conclusion seems reasonable and inevitable based on the two premises. Note that the strength of this argument is based solely on the degree to which the premises prove the conclusion. The truth of the premises themselves is not an issue in determining whether the argument is valid or invalid.

#### **Inferences and Assumptions**

When glancing through LSAT questions, you will frequently see the words inference and assumption. Let us take a moment to define the meaning of each term in the context of LSAT argumentation.

Most people have come to believe that the word inference means probably true or likely to be true. Indeed, in common usage infer is often used in the same manner as imply. On the LSAT these uses are incorrect. In logic, an inference can be defined as something that must be true. Thus, if you are asked to identify an inference of the argument, you must find an item that must be true based on the information presented in the argument.

Earlier we discussed assumptions in the context of commonsense assumptions that you can bring into each problem. In argumentation, an assumption is simply the same as an unstated premise—what must be true in order for the argument to be true. Assumptions can often have a great effect on the validity of the argument.

Separating an inference from an assumption can be difficult because the definition of each refers to what "must be true." The difference is simple: an inference is what follows from an argument (in other words, a conclusion) whereas an assumption is what is taken for granted while making an argument. In one sense, an assumption occurs "before" the argument, that is, while the argument is being made. An inference is made "after" the argument is complete, and follows from the argument. Both concepts will be discussed in more detail in later chapters, but for the time being you should note that all authors make assumptions when creating their arguments, and all arguments have inferences that can be derived from the argument.

#### The Mind of an LSAT Author

Let us take a moment to differentiate the makers of the test from the author of each stimulus. The maker of the test is Law Services, the organization that oversees the protocols under which the LSAT is constructed, administers the test, and processes and distributes the results. The stated purpose of the test makers is to examine your ability to analyze arguments, in an attempt to assess your suitability for law school. The author of the stimulus is the person from whose point of view each piece is written or the source from which the piece is drawn. Sometimes the persona of the author is made abundantly clear to you

Actually, Law Services now calls themselves the "producers of the LSAT." This signifies that some important test-making functions are now outsourced. because the stimulus is prefaced by a short identifier, such as Politician or Professor, or even a proper name such as Fran or Inez. The source of a stimulus can also be made clear by similar identifiers, such as Advertisement or Editorial.

LSAT students sometimes confuse the aim of the test makers with the way those aims are executed. We know that Law Services has an active interest in testing your ability to discern reasoning, both good and bad. The makers of the exam intentionally present flawed arguments because they want to test if you are easily confused or prone to be swayed illogical arguments. This often raises situations where you are presented with arguments that are false or seemingly deceptive in nature. This does not mean that the author of the piece is part of the deception. The role of an LSAT author is simply to present an argument or fact set. LSAT authors (as separated from the test makers) do not try to deceive you with lies. Although LSAT authors may end up making claims that are incorrect, this is not done out of a willful intention to deceive. Deception on the author's part is too sophisticated for the LSAT—it is beyond the scope of LSAT stimuli, which are too short to have the level of complexity necessary for you to detect deception if it was intended. So, you need not feel as if the author is attempting to trick you in the making of the argument. This is especially true when premises are created. For example, when an LSAT author makes a premise statement such as, "19 percent of all research projects are privately funded," this statement is likely to be accurate. An LSAT author would not knowingly create a false premise, and so, when examining arguments the likelihood is that the premises are not going to be in error and you should not look at them as a likely source of weakness in the argument. This does not mean that authors are infallible. LSAT authors make plenty of errors, but most of those errors are errors of reasoning that occur in the process of making the conclusion. In later chapters we will examine these flawed reasoning methods in detail.

Not only do LSAT authors not attempt to deceive you, they believe (in their LSAT-world way) that the arguments they make are reasonable and solid. When you read an LSAT argument from the perspective of the author, he or she believes that their argument is sound. In other words, they do not knowingly make errors of reasoning. This is a fascinating point because it means that LSAT authors, as part of the LSAT world, function as if the points they raise and the conclusions they make have been well-considered and are airtight. This point will be immensely useful when we begin to look at certain forms of reasoning.

Consider the following argument: "My mail was delivered yesterday, so it will also be delivered today."

Although this argument is flawed (it could be Sunday and the mail will not be delivered), the author has not intentionally made this error. Rather, the author has made the conclusion without realizing that an error has occurred.

#### **Read the Fine Print**

One of the purposes of the LSAT is to test how closely you read. This is obviously an important skill for lawyers (who wants a lawyer who makes a critical mistake on a big contract?). One of the ways the LSAT tests whether you have this skill is to probe your knowledge of exactly what the author said. Because of this, you must read all parts of a problem incredibly closely, and you must pay special attention to words that describe the relationships under discussion. For example, if an author concludes, "Therefore, the refinery can achieve a greater operating efficiency," do not make the mistake of thinking the author implied that greater operating efficiency will or must be achieved. The LSAT makers love to examine your comprehension of the exact words used by the author, and that leads to the fourth Primary Objective:

# Primary Objective #4: Read closely and know precisely what the author said. Do not generalize!

When it comes to relationships, the makers of the LSAT have a wide variety of modifiers in their arsenal. The following are two lists of words that should be noted when they appear, regardless of whether they appear in the premises or conclusion.

Quantity Indicators	Probability Indicators
all	must
every	will
most	always
many	not always
some	probably
several	likely
few	should
sole	would
only	not necessarily
not all	could
none	rarely
	never

Quantity indicators refer to the amount or quantity in the relationship, such as "some people" or "many of the laws." Probability indicators refer to the likelihood of occurrence, or the obligation present, as in "The Mayor should resign" or "The law will never pass." Many of the terms fit with negatives to form an opposing idea, for example, "some are not" or "would not."

Words such as the Quantity and Probability Indicators are critical because they are a ripe area for the LSAT makers to exploit. There are numerous examples of incorrect answer choices that attempted to capitalize on the meaning of a single word in the stimulus and thus you must commit yourself to carefully examining every word on the test.

These word lists do not require memorization. They are presented to give you a broad idea of the type of words that can take on an added importance in LSAT questions.

#### Scope

One topic you often hear mentioned in relation to argumentation is scope. The scope of an argument is the range to which the premises and conclusion encompass certain ideas. For example, consider an argument discussing a new surgical technique. The ideas of surgery and medicine are within the scope of the argument. The idea of federal monetary policy, on the other hand, would not be within the scope of the argument.

Arguments are sometimes described as having a narrow (or limited) scope or a wide (or broad) scope. An argument with a narrow scope is definite in its statements, whereas a wide scope argument is less definite and allows for a greater range of possibility. When we begin to examine individual questions, we will return to this idea and show how it can be used to help consider answer choices in certain situations.

Scope can be useful idea to consider when examining answer choices, because some answer choices go beyond the bounds of what the author has established in the argument. However, scope is also a concept that is overused in modern LSAT preparation. One test preparation company used to tell instructors that if they could not answer a student's question, they should just say that the answer was out of the scope of the argument! As we will see, there are always definite, identifiable reasons that can be used to eliminate incorrect answer choices.

#### **Notating Arguments**

When first studying Logical Reasoning, many students ask if they should make notations on or next to each question. The answer depends on the student. Some people feel very comfortable making notes in the margin and marking important words or phrases; other students feel these notes waste time and are distracting. In our experience, either approach can be successful—it is simply a matter of personal preference.

In general, because so many people get used to note-taking and highlighting text in college, we feel that you should make notes unless you find them bothersome. Although most students develop their own personal system, here are a few symbolizations that you might find useful:

Basic Underlining or Circling

This is the simplest and most common technique of all: attempt to pick out words or phrases that give decisive information or indicate a turning point in the stimulus. One or two quick underlines can help crystallize the information, allowing you to more easily handle the information. Some students prefer to circle key words instead of underlining, and that works equally well. Here is an example of underlining: Notations made to the passage are different than diagramming in response to a form of reasoning. In the chapter on sufficient and necessary conditions we will discuss the diagramming of conditional statements, and most people will find that making those diagrams is extremely helpful.

#### CHAPTER TWO: THE BASICS OF LOGICAL REASONING