PowerScore®

LSAT
LOGICAL REASONING BIBLE

A Comprehensive System for
Attacking the Logical Reasoning
Section of the LSAT.

2017 EDITION

David M. Killoran

Author of the famous
PowerScore LSAT
Logic Games Bible!

PowerScore®

The following is a short excerpt from our LSAT Logical Reasoning Bible,
and is designed to illustrate PowerScore's methods and writing style.

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About PowerScore

PowerScore is one of the nation's fastest growing test preparation companies. Founded in 1997, PowerScore offers LSAT, GMAT, GRE, SAT, and ACT preparation classes in over 150 locations in the U.S. and abroad. Preparation options include Full-length courses, Weekend courses, Live Online courses, and private tutoring. For more information, please visit our website at www.powerscore.com or call us at (800) 545-1750.

For supplemental information about this book, please visit the *Logical Reasoning Bible* website at www.powerscore.com/lrbible. The website contains additions to the text and answers to questions submitted by students.

About the Author

David M. Killoran, a graduate of Duke University, is an expert in test preparation with over 25 years of teaching experience and a 99th percentile score on a LSAC-administered LSAT. In addition to having written the renowned *PowerScore LSAT Logic Games Bible*, the *PowerScore LSAT Logical Reasoning Bible*, and many other popular publications, Dave has overseen the preparation of countless students and founded two national LSAT preparation companies.

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Chapter Two: The Basics of Logical Reasoning

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Chapter Two: The Basics of Logical Reasoning

The Logical Reasoning Section ▬▬

The focus of this book is on the two scored Logical Reasoning sections of the LSAT, and each Logical Reasoning section contains a total of 24 to 26 questions. Since you have thirty-five minutes to complete each 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 almost every student 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 sections.

On average, you have 1 minute and 25 seconds to complete each question, but this varies slightly depending on how many questions are in the section.

The last chapter of this book contains an extensive discussion of overall section time management.

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."

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Always read each of the five answer choices before deciding which answer is correct.

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. The other interesting part of the directions is the sentence that states:

> "You should not make assumptions that are by commonsense standards implausible, superfluous, or incompatible with the passage."

Assumptions are a critical part of LSAT Logical Reasoning, and we will talk about assumptions in more detail in a later chapter.

The implication here is that you can make some assumptions when working with questions, but not other assumptions. Of course, LSAC does not hand out a list of what constitutes a commonsense 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, when approaching each question you can take as true any statement or idea that the average North American would be expected to understand on the basis of generally known and accepted facts. For example, in a question, you can assume that the sky sometimes is cloudy, but you cannot assume that the sky is always cloudy (unless stated explicitly in 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 the 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.

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 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. Most serious students are happy students, and most serious students go to graduate school. Furthermore, all students who go to graduate school are overworked. ———— Stimulus

    Which one of the following can be properly inferred from the statements above? ———— Question Stem

    (A) Most overworked students are happy students.
    (B) Some happy students are overworked.
    (C) All overworked students are serious students. ———— Answer Choices
    (D) Some unhappy students go to graduate school.
    (E) All serious students are overworked.

The question to the left, from a released 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.

Approaching the Questions—What To Read First?

When examining the three parts, students sometimes wonder about the best basic 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. These texts are generally 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 your ability to fully absorb and comprehend the information in the stimulus. On easy questions this distraction tends not to have a significant negative impact, but more difficult questions often require a second reading of the stimulus in order to get full comprehension, thus wasting valuable time. When students choose to read the question stem first, they are forced to mentally juggle two things at once: the question stem and the information in the stimulus. That is a difficult task under any condition, but even more so when under time pressure. The bottom line is that any viable strategy must be effective for questions at all difficulty levels, and 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.

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2. Reading the question stem first often wastes valuable time because 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 the rare occasion you encounter a stimuli with two questions (more on the frequency of these questions later), 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.

6. Finally, one of the main principles underlying the read-the-question-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 show 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 an imperfect 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, and the general view of the author. 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 from 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 to see in the real world. 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.

Later in this chapter we will discuss argument soundness and argument construction. For now, just consider that your initial goal is to get a strong handle on what the author says in each stimulus.

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 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 diligence (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.

Reading closely is a critical LSAT skill.

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 test makers create LSAT arguments. We will discuss argumentation in more detail in a moment.

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

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The Range of Stimulus Topics—Including Science

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."

Some specific topics do tend to recur—such as discussions of dinosaurs or medical side effects. This occurs because the individuals making the questions know more about certain topics than others, and they tend to return to those topics. Unfortunately, this recurrence offers you no benefit other than that you may at least be familiar with the topic via taking past PrepTests.

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 (more on this topic in the next section). Any element beyond the domain of general public knowledge will be explained for you, as in the following example:

> Researcher: Einstein's *Annus Mirabilis Papers*, the 1905 works that introduced some of his most notable and recognizable theories, were at first overlooked by many physicists of the time, and flatly rejected by others. These works were so important, however, that years later...

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 Einstein's *Annus Mirabilis Papers*, and so the test makers conveniently furnish that information. Thus, although on occasion you will see a stimulus that references an ominous looking word or idea (recent examples include *Aspergillus* and *nahcolite*), 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.

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Speaker Identifiers

In a number of LSAT Logical Reasoning questions, the first thing you see is a specific description of the type of speaker who is making the argument that follows. For example, you might see "Archaeologist" or "Expert," as on one recent LSAT, or "Researcher" as in the problem on the prior page. Most students fly right by these speaker identifiers without further thought, but they shouldn't—there are times when such identifiers can convey very useful information.

Before addressing some of the information we can derive from these identifiers, let us make clear that knowing the type of LSAT speaker making an argument does not tell you the specific level of logical difficulty in a question. For example, an argument made by a Mayor is not necessarily easier or harder than an argument made by a Journalist. And the questions and answers that accompany specific identifiers are not of a predictable degree of difficulty, either; you can't just take a quick glance, see an identifier like "Dentist," and make a determination that you are about to see an easy or difficult question. This should not be surprising at all—the makers of the LSAT are smart enough to avoid a pattern where every question preceded by something like Researcher is automatically difficult. However, just because the level of difficulty isn't necessarily correlated with the type of speaker does not mean there aren't other valuable lessons to be derived from these identifiers.

First, certain speaker identifiers tend to be strongly indicative of the topic of the argument. For example, arguments preceded by names such as Researcher or Scientist are generally more science-oriented than other arguments (which is not all that surprising—the "Scientist" identifier is there to tell you that this is someone with knowledge of science, and by definition someone who is more likely to talk about science!). So, as you read, take note of those identifiers because in many cases they can provide clues about the topic that is about to follow. And since being forewarned helps you to be forearmed, this can provide a small advantage as you attack the questions. Here are a few sample category examples with related identifiers that have appeared on previous LSATs:

Politics: Politician, Mayor, Councilmember, Council chair
Science: Scientist, Researcher, Astrophysicist, Zoologist
Medicine: Doctor, Dentist, Pediatrician, Physician

The topics each typically introduces are what you would expect based on their titles, and that same logic follows for the other groupings you encounter (such as "Coach" or "Business Owner").

Speaker identifiers often foretell the broad topic addressed in the stimulus, but they do not indicate the specifics of the argument, the type of question, or the level of difficulty of the question.

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What happens when someone is identified with a compound title, such as Science Teacher?

Normally, the topic broadens to include topical issues from both identifiers. For example, in one LSAT argument, a stimulus preceded by "Science Teacher" was about getting young people excited about science, a discussion combining both science and education.

Ultimately, while the type of speaker won't tell you the specifics of what will be discussed, any extra insight into the general topic can give you a slight advantage as you begin to decode the argument.

Of course, not all identifiers give us a strong sense of what will follow. Personal names such as Brad or Ana do not give us any idea of what the topic of the stimulus will be, and even more specific terms aren't always helpful. For example, a Columnist could write about a wide variety of topics, from local politics to wildlife to a restaurant opening. This does not mean such a prefacing indicator is useless: columnists typically write columns with opinions, and so you know they will usually explain an issue or situation, and then take a certain position. And, even seemingly broad identifiers can tell you more than you might initially expect. For example, a Novelist may write about any topic, but it is almost certainly going to be linked to books; an Economist is typically going to discuss something related to money, taxes, or economic policies. The key is to not just gloss over the identifier—instead, become used to taking note of the identifier and relating that to what follows. Over time you will develop a better sense of which identifiers are likely to tip you off to what you are about to read, and which ones are not.

Second, although most identifiers do not give you a specific expectation of what argument will follow, there are a few types that do. For years, if you saw the term "Advertisement" in front of a stimulus, it meant that the stimulus would contain flawed reasoning. This continues today and it occurs because advertising is an easy target (because who really likes ads after all?). Arguments made by Politicians (or politically related persons) also often contain poor reasoning, and that is probably because they are such easy targets as well (because who, other than their families, really loves politicians?).

The important takeaway here is that you should not skip over the speaker identifier—sometimes it can provide valuable advance notice of what will follow, and sometimes it can even warn you to be on the lookout for a flawed argument.

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LSAT Vocabulary

Continuing the theme from the prior section, students are often concerned that success on the LSAT requires an especially large vocabulary, or perhaps a working knowledge of legal or logical terms. In fact, much of the language featured on the LSAT is made up of common, familiar terms (such as "city," "witness," and "fuel") that most native English speakers would not find challenging. Of course, it's not the simple words that worry most people. It's the comparatively small number of less familiar terms that tend to cause the most concern. Challenging LSAT vocabulary falls into three distinct categories:

1. Advanced Words

"Advanced words" are the high-level vocabulary words that you rarely encounter in daily life. Examples (not from the LSAT) would include words such as "tenebrous" or "recondite." Those are words that you just do not hear in normal conversation with your friends, classmates, or coworkers! Fortunately, words that are this obscure are extremely rare on the LSAT, and generally the most difficult vocabulary words that appear on the test are challenging but somewhat more common—words such as "eschew" or "flouted" (both of which *have* been used on the LSAT).

Tenebrous: gloomy or dark

Recondite: beyond ordinary understanding

When considering what vocabulary level is required for a strong LSAT performance, let's consider what the test makers have to say about the issue. According to LSAC, "Generally, the selections are densely written, use high-level vocabulary, and contain sophisticated argument or complex rhetorical structure (for example, multiple points of view)." Additionally, "These questions assess the ability to analyze, critically evaluate, and complete arguments as they occur in ordinary language." So, there is an expectation of a high-level vocabulary, but there is no precise definition as to what that means, and certainly no published list of words that constitute a high-level vocabulary.

So, should you study a list of hard vocabulary words in preparation for the LSAT? The answer is no. First, you would likely be wasting a huge amount of time preparing for words that you most likely would not see on the test. Second, and more importantly, there is a compensation when challenging vocabulary is used: when this happens, LSAT authors generally either define such terms or provide sufficient context in the passage to determine what the word means. For example, an LSAT question about scientific discoveries that used the word "serendipity" immediately followed that usage by giving the definition of that word as "the chance discovery of valuable findings." Thus, even without knowing the meaning of serendipity, you could still easily complete the question. The bottom line is that in most cases, when you encounter what would be termed as high-level vocabulary, there will be information around that usage that helps you to understand the meaning of the given term.

In another example, an LSAT question used the word "duplicitous," but prior to that usage had described the behavior of the individuals in question in a way that made it clear that "duplicitous" meant "deceptive" or "deceitful."

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2. Scientific/Technical/Legal Jargon

As mentioned previously, specialized terminology can be among the scariest vocabulary you encounter on the LSAT. Seeing terms such as "amygdala," "thermovoltaic generators," or "tangible-object theory" will cause most test takers to pause for a moment. However, such specialized terms are beyond the general vocabulary of almost every LSAT taker, so LSAC would not expect test takers to be familiar with them. In each instance, a definition or usage information will be supplied in the passage. Although definitions are often in the immediate vicinity of the first appearance of the word, in some cases (notably in Reading Comprehension) the definition is provided a number of lines later. Regardless, when you see terms of this type, you should begin looking for the definition that will almost certainly be provided (and relax, because you will not have to guess at the meaning of the word).

Note that one of the common tricks of the test makers is to place an ominous looking word before a more commonly understood concept. For example, when the phrase "Streptococcus bacteria" was used on the LSAT, no definition was given. Of course, the test makers expect everyone to understand the basic ideas behind bacteria, and the question itself did not hinge on any specific knowledge relating to Streptococcus. Thus, there was no need for a specific discussion of that particular type of bacteria.

3. Logical Terminology

While the LSAT does not require you to understand specific terms from the scientific, medical, technical, or legal worlds, many LSAT questions do hinge on your knowledge of certain words or phrases that are part of the logical canon of the test. Most of the words that present problems are not specialized logic terms, though. As LSAC notes, "The questions do not presuppose specialized knowledge of logical terminology. For example, you will not be expected to know the meaning of specialized terms such as 'ad hominem' or 'syllogism.'"

We offer a free LSAT vocabulary quiz on the book website (see page 5 for the web address). Take the quiz and see how you rate!

Instead, the words and phrases that cause problems on the LSAT tend to be those that are defined in a way that differs from their more common, "real world" definitions. These words, such as "some" (which on the LSAT might refer to just one single example or include all examples), and "either…or," (which on the LSAT still allows for the possibility of *both*) appear innocent but can cause serious problems if misinterpreted during the exam. Because even a single missed question can decrease your scaled LSAT score by one point, LSAT students must know the exact definitions of the logical terms that LSAC uses frequently, and later in this book we will cover each of those terms (and more!) in greater detail.

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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™. Your first task is to determine whether 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 from 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.

2

Identifying Premises and Conclusions

For LSAT purposes, a premise can be defined as:

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

A premise gives a reason why something should be believed.

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.

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

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:

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

Remember that words can be used in different ways. Thus, a word can appear on this list and not be used as a premise or conclusion indicator.

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

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Because there are so many word choices 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 on the prior page. 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 commonly-used 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! We mean instead a set of statements given in support of a position). 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 a pretend 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.

Sidebar notes:

Arguments can contain more than one premise and more than one conclusion, and thus multiple premise or conclusion indicators can be present in any given argument.

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

One way to visualize the relationship of premises and conclusions is to think of an argument as a house. The premises are like the walls of the house, and the conclusion is like the roof— supported by those walls. Another analogy that might help you to visualize the relationship is that of a table: the premises are the legs, and the conclusion is the tabletop.

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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 appears in the middle, and is "congress will pass a stricter fraud control bill."

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.

Notice that premises and conclusions can be presented in any order—the conclusion can be first, last, or in the middle, 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. This leads to your second objective:

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

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.

The following is a short excerpt from our LSAT Logical Reasoning Bible, and is designed to illustrate PowerScore's methods and writing style.

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One Confusing Indicator 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 at the above word arrangements would seem to indicate that what will follow is both a premise and a conclusion. However, that is not the case. In these instances, 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, because 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.

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Chapter Eight: Cause and Effect Reasoning

Chapter Eight: Cause and Effect Reasoning

The following is a short excerpt from our LSAT Logical Reasoning Bible, and is designed to illustrate PowerScore's methods and writing style.

What is Causality?

When examining events, people naturally seek to explain why things happened. This search often results in cause and effect reasoning, which basically asserts or denies that one thing causes another, or that one thing is caused by another. On the LSAT, cause and effect reasoning appears in many Logical Reasoning problems, often in the conclusion where the author mistakenly claims that one event causes another. For example:

> Last week Google announced a quarterly deficit and the stock market dropped 10 points. Thus, Google's announcement must have caused the decline.

Like the above conclusion, many causal conclusions are flawed because there can be alternate explanations for the stated relationship: another cause could account for the effect; a third event could have caused both the stated cause and effect; the situation may in fact be reversed; the events may be related but not causally; or the entire occurrence could be the result of chance.

In short, causality occurs when one event is said to make another occur. The *cause* is the event that makes the other occur; the *effect* is the event that follows from the cause. By definition, the cause must occur before the effect, and the cause is the "activator" or "ignitor" in the relationship. The effect always happens at some point in time after the cause.

How to Recognize Basic Causality

On the LSAT, a basic cause and effect relationship has a signature characteristic—a single cause *makes* an effect happen. Thus, there is an identifiable type of expression that is typically used to indicate that a causal relationship is present. The list on the following page contains a number of the phrases used by the makers of the LSAT to introduce this type of causality, and you should be on the lookout for these phrases when reading Logical Reasoning stimuli.

As mentioned before, this is a book about LSAT logic, not general philosophy. Therefore, we will not go into an analysis of David Hume's Inquiry or Mill's Methods (both of which address causality) because although those discussions are interesting, they do not apply to the LSAT.

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Basic causal conclusions on the LSAT assert that "A made B occur." The relationship is typically between two variables, and the fact that one made the other occur is stated in absolute or certain terms. Later in this chapter we will examine advanced causality, which is often more complex than a simple "A made B occur" relationship.

The following is a short excerpt from our LSAT Logical Reasoning Bible, and is designed to illustrate PowerScore's methods and writing style.

The following terms often introduce a basic cause and effect relationship, where an effect is attributed to a particular cause:

caused by
because of
responsible for
reason for
leads to
induced by
promoted by
determined by
produced by
product of
is an effect of

Because of the breadth of the English language, there are many alternate phrases that can introduce basic causality. However, those phrases would all have the similar characteristic of asserting that one event *made* another occur.

The Difference Between Causality and Conditionality

Many people initially confuse causal reasoning with conditional reasoning, but the two are very different! Here are several key differences:

1. The chronology of the two events can differ.

    In cause and effect statements there is an implied temporal relationship: the cause must happen first and the effect must happen at some point in time after the cause.

    In sufficient and necessary statements there is no implied temporal relationship: the sufficient condition can happen before, at the same time as, or after the necessary condition.

2. The connection between the events is different.

    In cause and effect statements the events are typically related in a direct way: "She swerved to avoid hitting the dog and that caused her to hit the tree." The cause physically *makes* the effect happen.

    In conditional statements the sufficient and necessary conditions are often related directly, but they do not have to be: "Before

the war can end, I must eat this ice cream cone." The sufficient condition does not make the necessary condition happen, it just *indicates* that it must occur.

3. The language used to introduce the statements is different. Because of item 2, the words that introduce each type of relationship are very different. Causal indicators are typically active, relatively powerful words, whereas most conditional indicators do not possess those traits.

Causality in the Conclusion versus Causality in the Premises

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Causal statements can be found in the premise or conclusion of an argument. If the causal statement is in the conclusion, then the reasoning is possibly flawed. If the causal statement is in the premise, then the argument may be flawed, but most likely not because of the causal statement. Due to this difference, one of the critical issues in determining whether flawed causal reasoning is present is identifying where in the argument the causal assertion is made. The classic mistaken cause and effect reasoning we will refer to often in this book occurs when a causal assertion is made in the *conclusion*, or the conclusion presumes a causal relationship. Thus, let's examine the difference between an argument with a causal premise and one with a causal conclusion.

In the LSAT world, when a cause and effect statement appears as the conclusion, the conclusion is often questionable. In the real world that may not be the case because a preponderance of evidence can be gathered or visual evidence can be used to prove a relationship.

This is an argument with a basic causal conclusion:

Premise: In North America, people drink a lot of milk.

Premise: There is a high frequency of cancer in North America.

Conclusion: Therefore, drinking milk causes cancer.

In this case, the author takes two events that occur together and concludes that one must cause the other. This conclusion is invalid for the reasons discussed on the first page of this chapter.

If a causal claim is made in the premises, however, then usually no *causal* reasoning error exists in the argument (of course, the argument may be flawed in other ways). As mentioned previously, the makers of the LSAT tend to allow premises to go unchallenged (they are more concerned with the reasoning that follows from a premise) and it is considered acceptable for an author to begin his argument by stating a causal relationship and

then continuing from there, as in this example:

Note that the first premise in the argument to the right is untrue in the real world. However, on the LSAT, we'd simply take this premise at face value and see what the author did with it.

Premise:	Drinking milk causes cancer.
Premise:	The residents of North America drink a lot of milk.
Conclusion:	Therefore, in North America there is a high frequency of cancer among the residents.

The second example is considered valid reasoning because the author takes a causal principle and follows it to its logical conclusion. Generally, causal reasoning occurs in a format similar to the first example, but there are LSAT problems similar to the second example.

Situations That Can Lead to Errors of Causality

There are two scenarios that tend to lead to basic causal errors in Logical Reasoning questions:

1. One event occurs before another

   If you have taken a logic course, you will recognize the first scenario produces the Post Hoc, Ergo Propter Hoc fallacy.

   When one event occurs before another event, many people fall into the trap of assuming that the first event caused the second event. This does not have to be the case, as shown by the following famous example:

   > Every morning the rooster crows before the sun rises. Hence, the rooster must cause the sun to rise.

   The example contains a ludicrous conclusion, and shows why it is dangerous to simply assume that the first event must have caused the second event.

2. Two (or more) events occur at the same time

   When two events occur simultaneously, many people assume that one event caused the other. While one event could have caused the other, the two events could be the result of a third event, or the two events could simply be correlated without one causing the other, or be the result of random chance.

The following is a short excerpt from our LSAT Logical Reasoning Bible, and is designed to illustrate PowerScore's methods and writing style.

The following example shows how a third event can cause both events:

The consumption of ice cream has been found to positively correlate with the murder rate. Therefore, consuming ice cream must cause one to be more likely to commit murder.

As you might imagine, the conclusion of the example does not have to be true (yes, go ahead and eat that Ben and Jerry's!), and the two events can be explained as the effects of a single cause: hot weather. When the weather is warmer, ice cream consumption and the murder rate both tend to rise (this example is actually true, especially for large cities).

In this second example, the two events could simply be correlated. A positive correlation is a relationship where the two values move together. A negative correlation is one where the two values move in opposite directions, such as with age and eyesight (the older you get, the worse your eyesight gets).

The Central Assumption of Basic Causal Conclusions

Understanding the assumption that is at the heart of basic causal conclusions is essential to knowing why certain answers will be correct or incorrect. Most students assume that the LSAT makes basic assumptions that are similar to the real world; this is untrue and is a dangerous mistake to make.

When we discuss causality in the real world, there is an inherent understanding that a given cause is just one possible cause of the effect, and that there are other causes that could also produce the same effect. This is reasonable because we have the ability to observe a variety of cause and effect scenarios, and experience shows us that different actions can have the same result. The speakers on the LSAT do *not* think typically this way when making a basic causal conclusion. When an LSAT speaker concludes that one occurrence definitively caused another, that speaker also assumes that the stated cause is the *only* possible cause of the effect and that consequently the stated cause will *always* produce the effect. This assumption is extreme and far-reaching, and often leads to surprising answer choices that would appear incorrect unless you understand this assumption. Consider the following example:

Understanding this assumption is absolutely critical to your LSAT success. The makers of the test will closely examine your knowledge of this idea, especially in Strengthen and Weaken questions.

Premise:	Average temperatures are higher at the equator than in any other area.
Premise:	Individuals living at or near the equator tend to have lower per-capita incomes than individuals living elsewhere.
Conclusion:	Therefore, higher average temperatures cause lower per-capita incomes.

This is a classic flawed causal argument wherein two premises with a basic connection (living at the equator) are used as the basis of a conclusion that one of the elements actually makes the other occur. The conclusion is flawed because it is not necessary that one of the elements *must* have caused the other to occur: the two could simply be correlated in some way or the connection could be random.

In the real world, we would tend to look at an argument like the one above and think that while the conclusion is possible, there are also other things that could cause the lower per-capita income of individuals residing at or near the equator, such as a lack of natural resources. *This is not how speakers on the LSAT view this particular relationship.* When an LSAT speaker makes an argument like the one above, he or she believes that the *only* cause is the one stated in the conclusion and that, unless stated, there are *no other* causes that can create that particular effect. Why is this the case? Because for an LSAT speaker to come to that conclusion, he or she must have weighed and considered every possible alternative and then rejected each one. Otherwise, why would the speaker draw the given conclusion? In the final analysis, to say with certainty that higher average temperatures cause lower per-capita incomes the speaker must also believe that nothing else could be the cause of lower per-capita incomes.

Answer choices that otherwise appear irrelevant will suddenly be obviously correct when you understand the central causal assumption.

Thus, in every argument with a basic causal conclusion that appears on the LSAT, the speaker believes that the stated cause is in fact the only cause and all other theoretically possible causes are not, in fact, actual causes. This is an incredibly powerful assumption, and the results of this assumption are most evident in Weaken, Strengthen, and Assumption questions (we will discuss this effect on Strengthen and Assumption questions in a later chapter). Following is a brief analysis of the effect of this assumption on Weaken questions.

How to Attack a Basic Causal Conclusion

Whenever you identify a basic causal relationship in the conclusion of
an LSAT problem, immediately prepare to either weaken or strengthen
the argument. Attacking a basic cause and effect relationship in Weaken
questions almost always consists of performing one of the following tasks:

A. Find an alternate cause for the stated effect.

    Because the author believes there is only one cause, identifying
    another cause weakens the conclusion.

B. Show that even when the cause occurs, the effect does not occur.

    This type of answer often appears in the form of a counterexample.
    Because the author believes that the cause always produces the
    effect, any scenario where the cause occurs and the effect does not
    will weaken the conclusion.

C. Show that although the effect occurs, the cause did not occur.

    This type of answer often appears in the form of a counterexample.
    Because the author believes that the effect is always produced by
    the same cause, any scenario where the effect occurs and the cause
    does not will weaken the conclusion.

D. Show that the stated relationship is reversed.

    Because the author believes that the cause and effect relationship
    is correctly stated, showing that the relationship is backwards
    (the claimed effect is actually the cause of the claimed cause)
    undermines the conclusion.

E. Show that a statistical problem exists with the data used to make
    the causal statement.

    If the data used to make a causal statement are in error, then the
    validity of the causal claim is in question.

Stimuli
containing causal
arguments
are most
often followed
by Weaken,
Strengthen,
Assumption, or
Flaw questions.

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Diagramming Causality

Like conditional statements, causal statements can be quickly and easily represented by an arrow diagram. However, because causal and conditional diagrams represent entirely different relationships, we use designators ("C" for cause and "E" for effect) above the terms when diagramming (and, in corresponding fashion, we use "S" for sufficient and "N" for necessary above the terms when diagramming conditional statements). We use these designators in the book to make the meaning of the diagram clear. During the LSAT, students should not use the designators (they should just use the arrow diagram if anything is shown at all) because they want to go as fast as possible and they should be able to remember whether they have a conditional or causal argument while completing the problem.

Here is an example of a causal diagram:

During the LSAT, the choice to create an arrow diagram for a causal statement is yours, but the diagram is very often unnecessary.

Statement: "Smoking causes cancer."

S = smoking
C = cancer

$$\underline{C} \qquad \underline{E}$$
$$S \longrightarrow C$$

Although the diagram looks the same as a conditional diagram, the two are different for the reasons described in "The Difference Between Causality and Conditionality" section earlier in this chapter.