

HALE'S INTRODUCTION TO CRITICAL REASONING

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CHAPTER TWO: EVALUATING ARGUMENTS: THE BASIC CONCEPTS

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The Conditions for a Good Argument

Once we have identified an argument and its parts (that is, its premises and its conclusion), the next step is to *evaluate* the argument. Evaluating arguments is the topic that we will begin to explore in this chapter. When we are evaluating an argument, we must always ask two questions:

(1) Are the premises all true?

(2) If the premises are all true, are they good reasons to believe the conclusion?

It's important to see that these are very different kinds of questions. The first question is about whether what the premises say about how things are corresponds with the way things really are. The second question is about the *relationship of support* between the premises and the conclusion. So, the first question is a factual question, but the second question is a logical question. (This doesn't mean that the first question is illogical; the first question is outside the realm of logic: extralogical.) Another contrast between these two questions is that the second is hypothetical or conditional, given that it depends on the hypothesis or condition that the premises are all true; the first question is not hypothetical or conditional.

Here are a couple of other ways to think of the second question: if the premises are all true, do they really support the conclusion?, or, if the premises are all true, do they justify believing the conclusion?

Let me illustrate this difference with a couple of simple "made up" examples. First, consider the following argument, in which I refer to my cat Felix:

- (1) Felix is an owl.
- (2) All owls are birds.

- (3) Felix is a bird.

This is a bad argument because its first premise is false: Felix is a cat, not an owl. Look back at the two questions we must ask when evaluate an answer; about this argument, "no" is the answer to question (1).

By contrast, let's consider the following argument:

- (1) All cats are mammals.
- (2) Felix is a mammal.

- (3) Felix is a cat.

This is a bad argument because even if the premises are true, they aren't good reasons to believe the conclusion. Why not? Because cats are not the only kind of mammal, so even

though these premises are true, they leave wide open the possibility that Felix could be any kind of a mammal at all (not only a cat).

The fact that this argument's conclusion is true does not mean that the premises are good reasons for believing the conclusion. If you are unsure of this, ask yourself: why should you believe that Felix is a cat? I'm confident that your answer will not mention the premises of the argument above.

The answer to both of the two questions for evaluating an argument must be "yes" for an argument to be good. In other words, these two questions provide us with two conditions or criteria, both of which must be met for an argument to count as a good argument. These two conditions are:

- (1) The argument's premises are all true; and
- (2) If the premises are all true, they are good reasons to believe the conclusion.

Again, it is very important to be clear that the second condition is about a *logical relationship* between the premises and the conclusion. The premises do *not* need to be true for this logical relationship to be present. Let's reconsider the first example that we considered in this chapter, which was the following:

- (1) Felix is an owl.
 - (2) All owls are birds.
-
- (3) Felix is a bird.

We already noticed that this argument is bad because it does not meet the first condition. However, I would like for you to notice that it does meet the second condition, because *if* the premises were both true, *then* they would be good reasons to believe the conclusion. Again, this is a conditional or hypothetical relationship; its hypothetical nature is signaled by the word 'if'.

The second condition, however, is vague, because it does not precisely state what it means for premises, if they are true, to be "good reasons" to believe the conclusion; similarly, in the alternative phrasings of this condition that I gave you above, the crucial words 'support' and 'justify' were left undefined, and they are also inherently vague.

This vagueness is appropriate in a general definition of *good argument*, because arguers don't always intend for their premises to provide the same kind of support or the same degree of support for their conclusions. It is appropriate for us to evaluate arguments differently depending on arguers' intentions in this regard, so it is appropriate to make this second condition more precise in different ways, depending on the kind of argument that is being evaluated.

In the next section, we will concentrate on the conditions appropriate for evaluating deductive arguments. In the section after that, we will compare and contrast deductive and inductive arguments; those definitions will come later, so you don't need to worry about them yet.

The Conditions for a Good Deductive Argument

For any kind of an argument – deductive or not – to be good, its premises must all be true. Therefore, to clarify what makes a deductive argument good, we only need to clarify the second condition above. When evaluating deductive arguments, we do this by defining a valid argument. A **valid** argument is an argument that has this characteristic: *if the premises are all true, it is impossible for the conclusion to be false*. The opposite of a valid argument is an **invalid** argument. What's the opposite of impossibility? Possibility. So an **invalid** argument is an argument that has this characteristic: *if the premises are all true, it is possible for the conclusion to be false*. (Sometimes we speak of the *validity* or *invalidity* of arguments, or say that an arguer is reasoning *validly* or *invalidly*.) Validity and invalidity are determined by an argument's form (or structure or pattern), not its content.

A word of caution: the words 'valid' and 'invalid' are used in a number of different ways in ordinary English, but here we are using them with technical, precise meanings. If you are just "on the right track" in your understanding of these concepts, you will have trouble applying them correctly. So, you need to memorize and understand the precise definitions of these terms.

BOX 2A DEFINITIONS OF VALID ARGUMENT AND INVALID ARGUMENT:

VALID ARGUMENT = _{def} An argument with this characteristic: If the premises are all true, it is impossible for the conclusion to be false.

INVALID ARGUMENT = _{def} An argument with this characteristic:
If the premises are all true, it is possible for the conclusion to be false.

A valid argument, by definition, cannot have the following combination of actual truth values: all true premises and false conclusion. Any other combination of actual truth values is consistent with either validity or invalidity.

We call a *good deductive argument* a *sound argument*. A **sound** argument *is an argument that meets both of these conditions: (1) it has all true premises, and (2) it is valid*. Let me stipulate for now that both of the arguments we considered earlier in this chapter are deductive. They are both unsound, but they are unsound for different reasons.

The following example is unsound because, although it is valid, it does not have all true premises:

- (1) Felix is an owl.
- (2) All owls are birds.

- (3) Felix is a bird.

The following example is unsound because, although it has all true premises, it is invalid:

- (1) All cats are mammals.
- (2) Felix is a mammal.

- (3) Felix is a cat.

Here is an example of a sound argument:

- (1) Felix is a cat.
- (2) All cats are mammals.

- (3) Felix is a mammal.

What makes this argument sound? First, let's notice that both premises are true. Second, let's understand why this argument is valid. Since its premises are in fact true, I will not use conditional wording while considering the argument's validity. Instead, let's notice that given the truth of the premises, it is impossible for the conclusion to be false; other ways to put this point would be to say that the truth of the premises rules out any possibility of the conclusion's being false, or that the truth of premises guarantees the truth of the conclusion.

BOX 2B
DEFINITIONS OF *SOUND ARGUMENT*
AND *UNSOUND ARGUMENT*:

SOUND ARGUMENT = _{def} A valid argument with all true premises.

UNSOUND ARGUMENT = _{def} An argument that is invalid or that has at least one false premise (or both).

We will define a **deductive argument** as *an argument that is valid or that the arguer intends to be valid*. We will return to this definition in the next section.

Now I would like you to think what you should say about the soundness of an argument when you know that the argument is valid but you do not know whether all of its premises are, in fact, true. Consider the following example:

- (1) All U.S. senators must be U.S. citizens.
 - (2) My great grandfather was a U.S. senator.
-
- (3) My great grandfather was a U.S. citizen.

In giving you this example, I'm guessing that you know that the U.S. Constitution requires that all U.S. senators must be U.S. citizens, but that you don't know anything about whether my great grandfather was a U.S. senator. So, if my guesses are right, you do not know whether or not this argument has all true premises. Of course, you can tell that this argument is valid without knowing the truth values of its premises: you can tell that *if* the premises are both true, the conclusion must also be true, so you know that this argument is valid. To sum up: you know that *one* of the conditions for soundness is met, but you don't know whether *both* of the conditions for soundness are met or not. Therefore, you do not know whether this argument is sound or unsound.

In general, there are three options open to you when you are asked whether an argument is sound or unsound. You might answer:

- ◆ "The argument is sound."
- ◆ "The argument is unsound."
- ◆ "I don't know."

When asked about the example we just considered, you would have to answer that you don't know. You could elaborate on this answer in a way that shows that you understand the relevant definitions by saying:

"I don't know whether the argument is sound or unsound, because I don't know whether premise (2) is true or false, although I know that the argument is valid because I know that if the premises are true, it would be impossible for the conclusion to be false."

Since, so far in this chapter, we have only considered examples that I made up, I would like to show you that these concepts are used in "real life" reasoning, and can have important applications. Let's consider an extended excerpt from Abraham Lincoln's fifth debate with incumbent U.S. Senator Stephen Douglas in 1858, when they were running against each other

to represent Illinois in the U.S. Senate; I hope the fact that the language is old-fashioned (from 168 years ago), doesn't cause you too much trouble in understanding this example.

Mr. Lincoln and Senator Douglas, who had been a judge before serving in the Senate, disagreed about many issues, one of which was the U.S. Supreme Court's decision in the famous Dred Scott Case, which might be familiar to you. If you don't know what the Dred Scott Case was about, I'll give you a brief summary. Mr. Scott was an African American man enslaved in Missouri who sued for his freedom and that of his wife and two children on the grounds that, for four years, they had lived in Illinois and the Wisconsin Territory, where slavery was illegal, with their "owner," and the laws in both Illinois and the Wisconsin Territory declared that slaveholders gave up their rights to slaves if they stayed there for an extended period. The Supreme Court ruled against Mr. Scott, finding that neither he nor any other person of African ancestry could claim citizenship in the United States, and therefore Mr. Scott could not bring suit in federal court.

Senator Douglas agreed with the Supreme Court's decision, whereas Mr. Lincoln did not. Mr. Lincoln expressed the reason for his disagreement with the Supreme Court as follows:

I submit to the consideration of men capable of arguing whether, as I state it ... the [Supreme Court's] argument has any fault in it:

Nothing in the Constitution or laws of any State can destroy a right distinctly and expressly affirmed in the Constitution of the United States.

The right of property in a slave is distinctly and expressly affirmed in the Constitution of the United States.

Therefore, nothing in the Constitution or laws of any State can destroy the right of property in a slave.

I believe that no fault can be pointed out in that argument; assuming the truth of the premises, the conclusion ... follows inevitably. There is a fault in it as I think, but the fault is not in the reasoning; but the falsehood in fact is a fault of the premises. I believe that the right of property in a slave is not distinctly and expressly affirmed in the Constitution, and Judge Douglas thinks it is. I believe that the Supreme Court and the advocates of that decision may search in vain for the place in the Constitution where the right of property in a slave is distinctly and expressly affirmed. I say, therefore, that I think one of the premises is not true in fact.

[Abraham Lincoln, 1858, in Roy R. Basler, ed., *The Collected Works of Abraham Lincoln*, Vol. 3. (New Brunswick, NJ: Rutgers University Press, 1953), p. 231.]

After Mr. Lincoln summarized his interpretation of the Supreme Court's argument, he commented on the argument to show why he disagreed with the Court's conclusion. Mr.

Lincoln was quite familiar with classical deductive logic. Although he did not use the words 'sound' and 'valid', he quite clearly appeals to these concepts; the terminology we use in logic now was not introduced until sometime in the early 20th century (reliable sources disagree about exactly when and by whom it was introduced), but the concepts are ancient. When Mr. Lincoln said, "assuming the truth of the premises, the conclusion ... follows inevitably," he was expressing his view that the Supreme Court's argument was valid; notice that his phrase has the same meaning as our definition of a valid argument: *if the premises are all true, it is impossible for the conclusion to be false*. The "fault" – flaw, error, or mistake – in the argument, he continued, is that not all of the Court's premises were true; more specifically, the Court's second premise was false. Therefore, the argument was unsound, because its second premise was false; therefore, the Supreme Court had not justified its conclusion.

Although this example might be somewhat difficult to follow, especially because the language used in 1858 is outdated now, I wanted to show you that the concepts you are learning now are used in "real life" reasoning and can have important applications.

**PRACTICE PROBLEMS SET 2-1:
ARE THE ARGUMENTS SOUND?**

Instructions: *For each argument in this practice problems set, say whether it is sound or unsound. For any argument that is unsound, say what makes it unsound. (I have tried my best to use only examples for which you will know the truth values of all the statements in each argument. If my predictions about this are mistaken, please accept my apology, and please let me know where my predictions are wrong so I can make appropriate changes for future semesters.) Please check your work on these problems by comparing your answers to the answers at the end of this chapter.*

Sample Problems:

Original Argument:

- (1) Tokyo is in Japan.
- (2) Japan is in Asia.

(3) Tokyo is in Asia.

Answer:

Sound

Original Argument:

- (1) At least one U.S. president has been assassinated while in office.
- (2) George Washington was a U.S. president.

(3) George Washington was assassinated while in office.

Answer:

Unsound, because invalid

Original Argument:

- (1) All cars are trucks.
- (2) All trucks are motorcycles.

(3) All cars are motorcycles.

Answer:

Unsound, because premises (1) and (2) are both false

Original Argument:

- (1) There are two hundred and fifty states in the U.S.A.
- (2) George Washington was a U.S. president.

(3) There is a state named after George Washington.

Answer:

Unsound, because invalid and because premise (1) is false

Original Argument:

- (1) El Paso is in Texas
- (2) Texas is in the United States.

(3) El Paso is in the United States.

Answer:

Sound

1. (1) Nike makes shoes for all mammals.

(2) A cheetah is a mammal.

(3) Nike makes shoes for cheetahs.

2. (1) The country of France is in Texas.

(2) The country of Iran is in Nevada.

(3) Los Angeles is in California.

3. (1) Burbank is in California.

(2) CSUN is in Burbank.

(3) CSUN is in California.

4. (1) The earth is a planet.

(2) Los Angeles is on the earth.

(3) Los Angeles is on a planet.

5. (1) CSUN is a university.

(2) CSUN is in California.

(3) All universities are in California.

6. (1) Harvard University is a university.
(2) All universities are in California.

(3) Harvard University is in California.

7. (1) If you're a professional baseball player, then you are a professional athlete.
(2) Kobe Bryant was not a professional baseball player.

(3) Kobe Bryant was not a professional athlete.

8. (1) Only men have been U.S. presidents.
(2) Abraham Lincoln was a man.
(3) Abraham Lincoln was a U.S. president.

9. (1) All elephants can fly.
(2) All animals that can fly are mammals.

(3) All elephants are mammals.

10. (1) Only planets in our solar system orbit our sun.
(2) Mars orbits our sun.
(3) Mars is in our solar system.

BOX 2C

A CHALLENGING PROBLEM

The challenge is for you to make up an example of your own of each of the four different kinds of arguments:

- (1) A valid argument with at least one false premise and a false conclusion.
- (2) A valid argument with at least one false premise and a true conclusion.
- (3) An invalid argument with all true premises and a true conclusion.
- (4) A sound argument.

By “an example of your own,” I mean an example that is not from materials for this course, not one that you find on the internet, YouTube, etc., and not one from AI. You certainly may use examples from this course (and especially from Practice Problems Set 2-1) as models or inspiration to help you come up with examples of your own. Do your very best to make sure that the truth values of all your premises and conclusions will be common knowledge, so that I and your classmates will share this knowledge with you.

The Distinction Between Deductive and Inductive Arguments

Not all arguments are intended to be valid and have all true premises; that is, not all arguments are intended to be sound. Sometimes arguers genuinely intend for their arguments to be good, but they are trying to reach a “standard of proof” lower than validity – and sometimes they succeed. Let’s consider this example:

- (1) I will be away from home for twelve hours today.
 - (2) When I’m away from home for more than a couple hours, my cats usually get cranky.
-
- (3) My cats will get cranky today.

This argument is invalid, because the premises leave open the possibility that today my cats will act differently than they usually do, so even if (1) and (2) are true, (3) might be false. If we understand this argument as trying to meet a “standard of proof” lower than validity, however, it might be still be a good argument, because its premises might give us good reasons to believe its conclusion even though they do not guarantee the truth of the conclusion.

Consider, also, the following example:

[Rubén] Vizcaíno [is] ... a cantankerous man in his seventies who, judging by his short, fat tie, yellowed shirt and suspenders, probably hasn’t bought a new suit since the fifties.... [Rubén Martínez, *The Other Side: Fault Lines, Guerilla Saints, and the True Heart of Rock ‘n’ Roll*. (London: Verso, 1992), p. 90.]

Here, Mr. Martínez’s conclusion,

Rubén Vizcaíno hasn’t bought a new suit since the fifties,

is prefaced by the word ‘probably’. This tells us that Mr. Martínez doesn’t think that the truth of his premise guarantees the truth of his conclusion. Rather, he believes that if his premise is true, his conclusion is probably true too. Mr. Martínez is not trying to give a valid argument – he is trying to reach a lower “standard of proof.” We can understand my “made up” example about my cats in the same way; if the premises are true, then conclusion is probably true too.

This is the key to understanding the difference between *deductive* and *inductive* arguments. The basic idea underlying the distinction has to do with the degree of support the premises, if they are true, provide for the conclusion. A deductive argument, at its best – that is, just in case it is sound – provides a *guarantee* that its conclusion is true. Inductive arguments, no matter how good they are, can never provide such a guarantee. Rather, an inductive argument, at its very best, makes the truth of its conclusion *very likely*, but still less than certain or guaranteed.

For both deductive and inductive arguments, that the premises are true is one criterion that an argument meet in order to be a good one. However, the logical relationship required to hold

between the premises and the conclusion is different, depending on whether the argument is deductive or inductive.

As you already know, a deductive argument must be valid to be good, and we call a good deductive argument – a valid argument with all true premises – a sound argument. For inductive arguments, however, to be good, validity is not necessary. Instead of validity, *strength* is necessary. A **strong** argument is an argument that has the following characteristic: *if the premises are all true, it is very unlikely that the conclusion is false*. The opposite of a strong argument is a *weak* argument. Just as a deductive argument can be valid but not have all true premises (and, therefore, be unsound), an inductive argument can be strong but not have all true premises. We will call *an inductive argument that is strong and has all true premises* a **compelling** argument. A good inductive argument is compelling.

The definition of soundness implies that a sound argument cannot have a false conclusion. Let's consider some randomly chosen argument, which I will call X, about which we know only one thing: it is sound. Here is a simple argument that draws on the definition of soundness to prove that X's conclusion must be true:

(1) X is a sound argument.

(2) X has all true premises, and if X has all true premises then it is impossible for X's conclusion to be false.

(3) It is impossible for X's conclusion to be false.

Notice that (2), the subconclusion, is simply a definition of soundness, and that (2) implies that it is impossible for X's conclusion to be false. Since this argument relies on only one aspect of X, namely, its soundness, this argument proves that **all** sound arguments have true conclusions.

A compelling argument can have a false conclusion. I will illustrate this further for you with an excerpt from Robert Woodward's book about Deep Throat. Here's some background information to help you understand this example. "Deep Throat" was the pseudonym of an anonymous informant who helped *Washington Post* reporters Robert Woodward and Carl Bernstein document and expose the Watergate scandal that led to the resignation of President Richard M. Nixon in 1974. (The reporters' use of this pseudonym was a reference to a popular pornographic movie released in 1972, and it was intended to be humorous; it was also intended to indicate that Deep Throat talked a lot, that is, divulged a lot of information.) Deep Throat arranged a series of covert meetings with Mr. Woodward during which he disclosed classified information and provided investigative tips. Mr. Woodward promised that he would keep Deep Throat's identity secret until either Deep Throat died or revealed his identity himself, and Mr. Woodward didn't even tell his journalistic partner, Mr. Bernstein, who Deep Throat was. For many years the mystery of Deep Throat's identity was the subject of intense speculation. One person rumored to have been Deep Throat was W. Mark Felt, who, during his lengthy career in

the FBI, rose as high as Associate Director, but was passed over for promotion to Director by President Nixon after the death of the long-time director, J. Edgar Hoover. Mr. Felt, it was believed, resented President Nixon's decision, and had also been morally offended by the corrupt behavior of President Nixon and some of his closest aides. For decades Mr. Felt denied that he was Deep Throat, but in 2005 at age 91, he admitted he really had been Deep Throat. Mr. Woodward was ready to go; within a week, he published a book a book about Deep Throat. In this book, he wrote:

In June [of 1974], *Washingtonian* magazine published a story saying Felt was the most likely candidate to be Deep Throat, reasoning that he had motive, opportunity, access, knew the methods for clandestine meetings and was offended by Nixon and his men.

On June 25, *The Wall Street Journal* did one of their signature tongue-in-cheek front page feature stories headlined: "If You Drink Scotch, Smoke, Read, Maybe You're Deep Throat." It began, "W. Mark Felt says he isn't now, nor has he ever been Deep Throat. Of course, says the former acting associate director of the FBI, if he really were Deep Throat, you'd hardly expect him to admit it, now would you? Not that he is, Felt quickly adds."

Felt told the *Journal* reporter that he didn't disagree with the reasoning that it was he. "But I do disagree with the conclusion. Because I'm just not that kind of person." I recall reading the quote. It left me cringing. Felt told that *Journal* he thought that Deep Throat was a "composite." He was the first person I know of to float that theory – another false trail and superb cover for Deep Throat. [Bob Woodward, *The Secret Man: The Story of Watergate's Deep Throat*. (New York: Simon & Schuster, 2005), pp. 116-117.]

In this example, that the *Washingtonian* magazine's argument was intended as inductive is indicated by the phrase 'most likely'. This is reinforced by the response from Mr. Felt. Mr. Felt did not criticize the *Washingtonian*'s argument by saying that it had one or more false premises. Nor did he criticize the *Washingtonian*'s argument by saying that he disagreed with its logic or reasoning – in fact, he said didn't disagree with the *Washingtonian*'s reasoning, yet he still disagreed with the conclusion. Mr. Felt's comments make sense only if we:

- (1) interpret the *Washingtonian*'s argument as a compelling inductive argument;
- (2) understand Mr. Felt as recognizing the *Washingtonian*'s argument as a compelling inductive argument; and,
- (3) understand Mr. Felt as asserting that, even though the *Washingtonian*'s argument is compelling, its conclusion is false.

I will not require you to classify arguments as deductive or inductive. I will either stipulate that an argument is one or the other, or I will ask you to consider an argument in a certain way, or as each at separate times. In many cases, though, it will be obvious to you that a certain argument was intended to be deductive or meant as inductive.

BOX 2D

CRUCIAL DEFINITIONS FOR CHAPTER TWO

DEDUCTIVE ARGUMENT = _{def.} An argument that is valid or that the arguer intends to be valid.

A *good* deductive argument is **sound**.

SOUND ARGUMENT = _{def} A valid argument with all true premises. (Opposite: unsound) **Note:** *The term 'sound' is applied only to deductive arguments.*

UNSOUND ARGUMENT = _{def} An argument that is invalid or has at least one false premise (or both). (Opposite: sound) **Note:** *The term 'unsound' is applied only to deductive arguments.*

VALID ARGUMENT = _{def} An argument with this characteristic:
If the premises are all true, it is impossible for the conclusion to be false. (Opposite: invalid) **Note:** *The term 'valid' is applied only to deductive arguments.*

INVALID ARGUMENT = _{def} An argument with this characteristic:
If the premises are all true, it is possible for the conclusion to be false. (Opposite: valid) **Note:** *The term 'invalid' is applied only to deductive arguments.*

INDUCTIVE ARGUMENT = _{def.} An argument that is strong or that the arguer intends to be strong.

A *good* inductive argument is **compelling**.

COMPELLING ARGUMENT = _{def} A strong argument with all true premises. (Opposite: unconvincing) **Note:** *The term 'compelling' is applied only to inductive arguments.*

UNCOMPELLING ARGUMENT = _{def} An argument that is weak or has at least one false premise (or both). (Opposite: compelling) **Note:** *The term 'unconvincing' is applied only to inductive arguments.*

STRONG ARGUMENT = _{def} An argument with this characteristic:
If the premises are all true, it is very unlikely that the conclusion is false. (Opposite: weak) **Note:** *The term 'strong' is applied only to inductive arguments.*

WEAK ARGUMENT = _{def} An argument with this characteristic:
If the premises are all true, it is not very unlikely that the conclusion is false. (Opposite: strong) **Note:** *The term 'weak' is applied only to inductive arguments.*

Arguments with Unstated Premises

In Chapter One, we saw that sometimes arguers leave their conclusions unstated. Similarly, sometimes arguers leave a premise unstated. In fact, in everyday reasoning it is very common for either a premise or a conclusion to be left unstated. But before we can evaluate an argument, we need to know what all of its premises are and what its conclusion is. (How else could we tell whether its premises are all true? How else could we tell if its premises, assuming they are all true, provide adequate support for its conclusion?) So, when we come across an argument with an unstated premise or an unstated conclusion, we will need to add that unstated part.

When adding an unstated premise, just like when adding an unstated conclusion, we are not making it up or inventing it ourselves; rather, we are *interpreting* the arguer's intended meaning. When adding an unstated premise, it matters whether the argument is deductive or inductive.

An **unstated premise in a deductive argument** is *a premise that must be added for the argument to be valid*. By definition, then, every deductive argument with an unstated premise is valid. Of course, that does not mean that every deductive argument with an unstated premise is sound, because soundness requires not only validity but also that all the premises must be true.

Consider the following example:

Ghost is a cat, so he's a mammal.

Let's begin by assuming that this argument is deductive. We can reconstruct the stated parts of it as follows:

(1) Ghost is a cat.

(2) He's a mammal.

Clearly, this argument is invalid stated just like this, because no connection at all has been made between being a cat and being a mammal; without that connection, if (1) is true, it is quite possible for (2) to be false. But we can easily make this argument valid by adding a premise that makes the right kind of connection between (1) and (2). The *right kind* of connection is one that excludes the possibility that the conclusion is false, if the premises – both the stated premise and the unstated premise we will add – are true. We can state this connection as follows:

All cats are mammals.

Putting all of this together, we can understand the original argument as a valid deductive argument with an unstated premise, as follows:

- (1) Ghost is a cat.
- (2) All cats are mammals. (unstated)

- (3) He's a mammal.

Let's consider a "real life" example of an argument with an unstated premise that has the same structure as the "made up" example that we just considered, and which we will also assume to be deductive:

...[T]he Liguasan Marsh is part of Philippine territory, hence, the national government has dominion over it. ["Liguasan Marsh: Another Flashpoint?," Editorial, *Sun Star* (Philippines), June 7, 2007.]

We can reconstruct the stated parts of this argument as follows:

- (1) The Liguasan Marsh is part of Philippine territory.

- (2) The national government has dominion over it.

Similarly to the argument we just considered, in this argument no connection has been made between a place being part of Philippine territory and the Philippine national government having dominion over that place. You can think of this connection as assumed or unstated, and it is this connection we will have to state in adding an unstated premise to make this argument valid, as follows:

- (1) The Liguasan Marsh is part of Philippine territory.
- (2) The national government has dominion over all parts of Philippine territory.

- (3) The national government has dominion over the Liguasan Marsh.

Let's turn now to an example with a different structure:

A valid argument against the dolphin hunt could be that because they are wild animals, they should not be eaten.... [Alex G-Smith, "The Taiji Special: A Flipper Filet," *Daily Sundial* (California State University, Northridge), March 13, 2008.]

Here the arguer's introduction to the argument ("A valid argument against the dolphin hunt could be that...") makes it clear that this argument is intended to be valid. Let's begin our interpretation of this argument by reconstructing the stated parts, as follows:

- (1) Dolphins are wild animals.

- (2) Dolphins should not be eaten.

Obviously, this is invalid stated this way, because no connection has been made between wild animals and things that should not be eaten. Again, the kind of connection that will make this argument valid is one that excludes the possibility that the conclusion is false, if the premises – both the stated premise and the unstated premise we will add – are true. We can state this connection as follows:

No wild animals should be eaten.

Putting all of this together, we can understand the original argument as a valid deductive argument with an unstated premise, as follows:

- (1) Dolphins are wild animals.
- (2) No wild animals should be eaten. (unstated)

- (3) Dolphins should not be eaten.

For each of the two arguments we have just considered, we could have formed a conditional (“if...then...”) premise that would make the argument valid. The way to do this is to follow these steps: (1) start with the word ‘if’, (2) then repeat the stated premise, (3) then use the word ‘then’ (although you can skip this step), and (4) finish by repeating the conclusion, like this:

If stated premise then conclusion

Here are reconstructions of each of the three arguments we have just considered, but with the unstated premises stated as conditionals:

- (1) Ghost is a cat.
- (2) If Ghost is a cat, then he’s a mammal. (unstated)

- (3) He’s a mammal.

- (1) The Liguasan Marsh is part of Philippine territory.
- (2) If The Liguasan Marsh is part of Philippine territory, then the national government has dominion over it. (unstated)

- (3) The national government has dominion over it.

- (1) Dolphins are wild animals.
- (2) If dolphins are wild animals, then they should not be eaten. (unstated)

- (3) They should not be eaten.

Let’s turn now to considering inductive arguments with unstated premises. An **unstated premise in an inductive argument** is a *premise that must be added for the argument to be strong*. By definition, then, every inductive argument with an unstated premise is strong. But

that does not mean that every inductive argument with an unstated premise is compelling, because a compelling argument is a strong argument with all true premises.

Let's consider the following argument, with the stipulation that it is inductive:

(1) Felix is a cat.

(2) He likes tuna fish.

No connection has been made between the predicate concepts in (1) and (2) – that is, between being a cat and liking tuna fish – so this argument is weak; in other words, if (1) is true, it is not very unlikely that (2) is false. To make the argument strong, however, we can easily add the following premise, which someone who argued this way in real life would probably be assuming:

Most cats like tuna fish.

Putting all of this together, we can interpret the original argument as a strong inductive argument with an unstated premise, as follows:

(1) Felix is a cat.

(2) Most cats like tuna fish. (unstated)

(3) He likes tuna fish.

Let's consider a "real life" example, in which the author is writing about her experiences in high school, as follows:

People assumed I was a lesbian because I was more masculine than the average girl. [Helen Boyd, *She's Not the Man I Married: My Life with a Transgender Husband*. (Emeryville, California: Seal Press, 2007), p. 64.]

Before we reconstruct the stated parts of this argument, we need to notice that 'people assumed' is an argument attribution, not part of the argument, so it will not appear in our reconstruction:

(1) I was more masculine than the average girl.

(2) I was a lesbian.

The unstated premise must connect the concept of being more masculine than the average girl to the concept of being a lesbian, and the right kind of connection to make this argument strong is a connection in which if the premises are true, it is very unlikely that the conclusion is false.

Here is a way to do this:

- (1) I was more masculine than the average girl.
 - (2) Most girls who are more masculine than average are lesbians. (unstated)
-
- (3) I was a lesbian.

The unstated premise (2) is the kind of connection – a stereotype, in this case – assumed by the people who assumed that Professor Boyd, when she was in high school, was a lesbian.

Similarly to when we are adding unstated premises to deductive arguments, we can form conditional (“if...then...”) premises that will make inductive arguments strong. The difference between forming conditional premises to make deductive arguments valid and forming conditional premises to make inductive arguments strong is that when we do the latter, we include the word ‘probably’ (or a word or phrase with the same meaning, such as ‘very likely’) in the following process: (1) start with the word ‘if’, (2) then repeat the stated premise, (3) then use the word ‘then’ (although you can skip this step), and (4) finish by repeating the conclusion but be sure to include the word ‘probably’ someplace where it makes sense within that statement. Here are reconstructions of last two arguments we have just considered, but with the unstated premises stated as conditionals:

- (1) Felix is a cat.
 - (2) If Felix is a cat, then he probably likes tuna fish. (unstated)
-
- (3) He likes tuna fish.

- (1) I was more masculine than the average girl.
 - (2) If I was more masculine than the average girl, then I was probably a lesbian. (unstated)
-
- (3) I was a lesbian.

To make an argument **valid** by adding an unstated conditional premise, form the premise this way:

If stated premise then conclusion.

To make an argument **strong** by adding an unstated conditional premise, form the premise this way:

If stated premise then **probably** conclusion.

Let's consider another example, first thinking of it as a deductive argument and then thinking of as an inductive argument:

Because Gore Vidal is a famous person..., he has been interviewed hundreds of times. [Robert J. Stanton, "Introduction," in Robert J. Stanton, ed., *Views from a Window: Conversations with Gore Vidal*. (Secaucus, N.J.: Lyle Stuart, 1980), p. 15.]

Here is a reconstruction of the stated parts of the argument, and leaving room to add an unstated premise:

- (1) Gore Vidal is a famous person.
- (2) *unstated premise to be added*

- (3) He has been interviewed hundreds of times.

First, thinking of this as a deductive argument, we must add a premise that will make it valid. We can do this in the following way:

- (1) Gore Vidal is a famous person.
- (2) All famous people have been interviewed hundreds of times. (unstated)

- (3) He has been interviewed hundreds of times.

Next, let's think of this argument as inductive. So, now we must add a premise that will make it strong, like this:

- (1) Gore Vidal is a famous person.
- (2) Most famous people have been interviewed hundreds of times. (unstated)

- (3) He has been interviewed hundreds of times.

By now you might have noticed that a pattern in how I have been adding non-conditional unstated premises. When we've been assuming that the argument in question is deductive, I have added unstated premises with quantity words that do not allow for any exceptions (such as 'all' or 'no'). But when we have been assuming that an argument is inductive, I have been adding unstated premises with quantity words that do allow for exceptions (such as 'most'). This is a good strategy to keep in mind.

What if, in the example about Gore Vidal that we just considered, I had added the following:

Famous people have been interviewed hundreds of times,

as the unstated premise? This would be wrong! The reason is this would be wrong is that this statement is ambiguous in a way that blurs the distinction between deductive arguments and inductive arguments: it could mean that *all* famous people have been interviewed hundreds of

times or it could mean that *most* famous people have been interviewed hundreds of times. The difference between the quantity words 'all' and 'most' in this example is exactly the difference that causes one disambiguation to give us a valid argument and causes the other disambiguation to make the argument strong. Unstated premises which we add cannot be ambiguous in a way that obscures the distinction between deductive arguments and inductive arguments.

Sometimes it will not be easy to see a way to form an unstated premise that begins with a quantity word, and sometimes that approach might not even be possible, either for linguistic reasons or for logical reasons. In situations like this, simply use a conditional unstated premise, following the procedures for adding unstated conditional premises to deductive arguments and inductive arguments which I have shown you above.

Here is another example to illustrate this conditional approach, from a *Los Angeles Times* report on a study published in *Science* on February 16, 2007, which gave evidence that chile peppers were domesticated by agricultural societies in the Americas more than 6000 years ago:

Chiles are rich in vitamin C, so ancient people who ate them would have gained a nutritional advantage over those who didn't, said Scott Raymond, a University of Calgary archeologist and coauthor of the study. [Karen Kaplan, "Chiles' Kick Is an Old Story, Scientists Find," *Los Angeles Times*, February 16, 2007.]

Here is a reconstruction of the stated parts of Professor Raymond's argument, in which I have left space for the unstated premise that we will add:

- (1) Chiles are rich in vitamin C.
- (2) *unstated premise to be added*

(3) Ancient people who ate them would have gained a nutritional advantage over those who didn't.

Let's first consider this argument as deductive, so we will need to add a premise that will make the argument valid. While it would be possible to add an unstated premise that starts with a quantity word, it would be awkward, so instead I will add a conditional premise to make the argument valid, as follows:

- (1) Chiles are rich in vitamin C.
- (2) If chiles are rich in vitamin C, then ancient people who ate them would have gained a nutritional advantage over those who didn't. (unstated)

(3) Ancient people who ate them would have gained a nutritional advantage over those who didn't.

Now let's understand Professor Raymond's argument as inductive. On this assumption, we will need to add an unstated premise that leaves open a slight possibility that the conclusion is false

if the premises are true, which we can do by modifying slightly the unstated premise we already added when we were understanding the argument as deductive; just add the word 'probably' in the unstated premise, as follows:

- (1) Chiles are rich in vitamin C.
 - (2) If chiles are rich in vitamin C, then ancient people who ate them probably would have gained a nutritional advantage over those who didn't. (unstated)
-
- (3) Ancient people who ate them would have gained a nutritional advantage over those who didn't.

This conditional approach to adding unstated premises basically draws on one of the commonly used argument patterns that we studied in Chapter One when we covered arguments with unstated conclusions. Here is the pattern I have in mind:

A
If A then B
B

Quite infrequently, you will encounter instances of this argument pattern in which a conditional premise has been stated and the premise left unstated is non-conditional.

Here is an example in which the speaker is a Los Angeles County Deputy District Attorney, Stephen Kay, who was arguing against parole for convicted mass murderer Charles Manson during a parole board hearing:

If ... [Charles Manson] can't follow the simple rules of prison, how can we expect him to follow the rules of society? I think the answer is obvious. We can't. [Los Angeles Deputy District Attorney, Stephen Kay, November 30, 1982, speaking at a parole hearing for Charles Manson, quoted in Edward George with Dary Matera, *Taming the Beast: Charles Manson's Life Behind Bars*. (New York: St. Martin's Griffin, 1998), p. 166.]

To reconstruct the stated premise of Mr. Kay's argument, we will need to rephrase it because he used a rhetorical question to express the following statement:

If Charles Manson can't follow the simple rules of prison, then we can't expect him to follow the rules of society.

Here is a complete reconstruction of the stated parts of Mr. Kay's argument:

- (1) If Charles Manson can't follow the simple rules of prison, then we can't we expect him to follow the rules of society.
 - (2) *unstated premise to be added*
-
- (3) We can't we expect him to follow the rules of society.

Here is the structure of the stated premise and the conclusion:

If A then B
B

So, Mr. Kay's unstated premise must match A in the stated, conditional premise, which is:

Charles Manson can't follow the simple rules of prison.

Putting this all together, here is the reconstruction we get:

- (1) If Charles Manson can't follow the simple rules of prison, we can't we expect him to follow the rules of society.
 - (2) Charles Manson can't follow the simple rules of prison. (unstated)
-
- (3) We can't we expect him to follow the rules of society.

Occasionally you will encounter another argument pattern we studied while covering arguments with unstated conclusion in Chapter One, but used with an unstated premise. This is the pattern I have in mind now:

If A then B
If B then C
If A then C

Let's consider the following example. In 2005, the California Democratic Party was searching for a candidate to run against Governor Arnold Schwarzenegger in 2006. One name floated in the press was that of actor Warren Beatty. A reporter asked Mr. Beatty if he was going to run for the upcoming Democratic nomination for governor of California; at first, Mr. Beatty dodged the question, so the reporter asked the follow-up question that is typical in this situation, namely, whether he would rule it out. Here was his reply:

"I think if you rule it out, you're doing the wrong thing," Beatty said. "If you rule it out, you're saying, 'I won't serve the public even if asked.'" [Laura Kurtzman, "Democrats Eye Actor as Answer to Schwarzenegger," *San Jose Mercury News*, May 28, 2005.]

Let's notice that Mr. Beatty's stated premise and his conclusion are both conditionals. Although he did not use a premise indicator or a conclusion indicator, we could easily insert the word 'because' between his two sentences, which tells that his second sentence is his stated premise and, therefore, his first sentence must be his conclusion.

Here is a reconstruction of the stated parts of Mr. Beatty's argument:

- (1) If you rule out running for the governorship, then you're saying, 'I won't serve the public even if asked.'
 - (2) *unstated premise to be added*
-
- (3) If you rule it out, then you're doing the wrong thing.

The stated parts of Mr. Beatty's argument follow this pattern:

If A then B

If A then C

So, considering Mr. Beatty's argument as deductive, his unstated premise must have the following structure:

If B then C

Putting this all together into an argument reconstruction gives us the following:

- (1) If you rule out running for the governorship, then you're saying, 'I won't serve the public even if asked'.
 - (2) If you say, 'I won't serve the public even if asked', then you're doing the wrong thing. (unstated)
-
- (3) If you rule it out, then you're doing the wrong thing.

In my analysis so far of Mr. Beatty's argument, I have been considering it to be deductive. If we consider Mr. Beatty's argument as inductive, we will need to "water down" the unstated premise slightly, or, to use literal language, lessen the degree of support that the premises, taken together, provide for the conclusion, so that the argument will be strong rather than valid; we can do this as follows:

- (1) If you rule out running for the governorship, then you're saying, 'I won't serve the public even if asked'.
 - (2) If you say, 'I won't serve the public even if asked', then you're probably doing the wrong thing. (unstated)
-
- (3) If you rule it out, then you're doing the wrong thing.

Although I will not require you to classify arguments as either deductive or inductive, sometimes adding unstated premises makes it entirely clear which kind of argument was intended, because on one interpretation the unstated premise is reasonable but on the other interpretation the unstated premise is ridiculous. Consider the following example from historical fiction, in which a fictional character based on General Winfield Scott, general-in-chief

of the Union armies during the Civil War, is speaking to a fictional character based on Abraham Lincoln the day before Mr. Lincoln's second presidential inauguration in 1865:

I did not vote for you because I never vote. [Gore Vidal, *Lincoln*. (New York: Vintage Books, 1984), p. 24.]

Here is a reconstruction of the stated parts of General Scott's argument:

- (1) I never vote.
- (2) *unstated premise to be added*

- (3) I did not vote for you.

To my mind, the easiest way to add an unstated premise to General Scott's argument is to use a conditional approach. Here are two reconstructions, the first of which considers this argument as deductive and the second of which considers it as inductive:

Deductive:

- (1) I never vote.
- (2) If I never vote, then I did not vote for you. (unstated)

- (3) I did not vote for you.

Inductive:

- (1) I never vote.
- (2) If I never vote, then I probably did not vote for you. (unstated)

- (3) I did not vote for you.

The unstated premise, (2), in the first of these reconstructions is perfectly sensible, whereas the unstated premise in the second reconstruction is just silly; this is a very good indication that the original argument was intended to be deductive.

I want to warn you about a mistake I have often seen students make when adding an unstated premise to a deductive argument in which the stated premise is affirmative and the conclusion is a negation. Here is an example of the kind of argument I have in mind (which I am simply stipulating to be deductive):

- (1) Ghost is a cat.
- (2) *unstated premise to be added*

- (3) He cannot fly.

Sometimes students will try to make this kind of argument valid by adding an unstated premise with the following structure:

All ... not ...,

or

Every ... not ...,

or

Any ... not

For this argument, that would be

All cats cannot fly,

or

Every cat cannot fly,

or

Any cat cannot fly.

This is a mistake! The reason this is wrong is that these grammatical structures are ambiguous in a way that is crucial for validity. Sometimes they mean

No

For instance, in this example: No cats can fly.

But sometimes they mean

Some ... not = Not all....

For instance, in this example: Some cats cannot fly. = Not all cats can fly.

If the second of these structures seems counterintuitive to you, that is because you are disambiguating based on the *content* of the specific example under consideration, and you are drawing on the background knowledge you have about that *content*. Of course, you know that no cats can fly, so it's natural for you to disambiguate the grammatically ambiguous sentence as one you know to be true. But validity is a matter of *structure* not content.

Here is a “real life” example in which I hope it is obvious to you that the first of these structures (‘no ...’) is the intended meaning:

...[A]ny kind of sexual relationship between a correctional officer, deputy, or guards and an inmate or prisoner is not consensual because of the power dynamic between the officer and the prisoner. [Chris Daly, director of the Transgender Law Center, quoted in Heather Cassell, “Officer Charged for Sexual Misconduct with TG Prisoner,” *Bay Area Reporter*, July 26, 2007.]

Given that there is *always* a power dynamic (or, in other words, a power imbalance that defines the relationship) between a prison official and a prisoner, it is clear that Mr. Daly intends for his conclusion to allow for no exceptions. In other words, his conclusion is the following:

No kind of sexual relationship between a correctional officer, deputy, or guards and an inmate or prisoner is consensual.

Contrastingly, here is a “real life” example in which I hope it is obvious to you that the second of these structures (‘some ... not ...’ = ‘not all...’) is the intended meaning; this is an excerpt from Frederick Douglass’ account of his childhood in slavery, in which I have boldfaced and underlined his two ‘All ... not ...’ statements:

Why am I a slave? Why are some people slaves and others masters? These were perplexing questions and very troublesome to my childhood. I was very early told by some one that “*God up in the sky*” had made all things, and had made black people to be slaves and white people to be masters. I was told too that God was good, and that He knew what was best for everybody. This was, however, less satisfactory than the first statement. It came point blank against all my notions of goodness. ... I could not tell how anybody could know that God made black people to be slaves. Then I found, too, that there were puzzling exceptions to this theory of slavery, in the fact that **all black people were not slaves**, and **all white people were not masters**. [Frederick Douglass, *Life and Times of Frederick Douglass*. (New York: Collier Books, [1892], reprinted 1962), p. 50.]

Obviously, Mr. Douglass, who was enslaved for the first twenty years of his life, must have meant that some black people were not slaves and some white people were not masters, not that no black people were slaves or that no white people were masters.

The take-away for you is that, when adding an unstated premise to a deductive argument with an affirmative stated premise and a conclusion that is a negation, never use an

All ... not ...,

or

Every ... not ...,

or corresponding structure. Instead, you should either start the unstated premise with the quantity word 'no' (or 'nobody' or 'no one' if the statement is about people), or use a conditional, as follows:

- (1) Ghost is a cat.
(2) No cats can fly. (unstated)
-
- (3) He cannot fly.
- (1) Ghost is a cat.
(2) If Ghost is a cat, then he cannot fly. (unstated)
-
- (3) He cannot fly.

Let's consider an example of an inductive argument with an affirmative stated premise and a conclusion that is a negation, as follows:

Felix is a cat, so he doesn't like carrots.

When adding an unstated premise to an inductive argument with an affirmative stated premise and a conclusion that is a negation, also do not use an

All ... not ...,

or

Every ... not ...,

structure. Instead, you should use an unstated premise with a

Most ... not...,

structure, or use a conditional with the word 'probably' (or another word or phrase with the same meaning), as follows:

- (1) Felix is a cat.
(2) Most cats do not like carrots. (unstated)
-
- (3) He does not like carrots.
- (1) Felix is a cat.
(2) If Felix is a cat, then he probably does not like carrots. (unstated)
-
- (3) He does not like carrots.

Please do not make the mistake of using an unstated premise with a

Some ... are not...,

structure in this situation. Notice that the following argument is weak, because even if its premises are true, it is still quite probable that its conclusion is false:

(1) Felix is a cat.

(2) Some cats do not like carrots. (unstated)

(3) He does not like carrots.

**PRACTICE PROBLEMS SET 2-2:
RECONSTRUCTING ARGUMENTS WITH UNSTATED PREMISES**

Instructions: Each of the following passages contains an argument that has an unstated premise. For each passage, (1) reconstruct the argument including an unstated premise that will make the argument valid, and (2) reconstruct the argument including an unstated premise that will make the argument strong. Label the unstated premise as unstated. Do not add any ellipses (“...”) in your written work; it doesn’t matter whether you leave or remove any ellipses that were in an original passage. Please check your work on these problems by comparing your answers to the answers at the end of this chapter.

Sample Problems:

Original Passage:

Note: *The Arroyo chub is a small chunky fish, often called a minnow.*

The Arroyo chub is a *California Species of Special Concern*, and should be protected. [“The Arroyo Seco Stream,” Sign, Arroyo Seco Trail, City of Pasadena, California; recorded on January 9, 2021.]

Answer:

Reconstruction with an unstated premise that makes the argument **valid**:

- (1) The Arroyo chub is a *California Species of Special Concern*.
 - (2) All *California Species of Special Concern* should be protected. (unstated)
-

- (3) The Arroyo chub should be protected.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) The Arroyo chub is a *California Species of Special Concern*.
 - (2) Most *California Species of Special Concern* should be protected. (unstated)
-

- (3) The Arroyo chub should be protected.

Original Passage:

Peanuts are not nuts at all but a member of the bean family.... [Bill Neal, *Bill Neal's Southern Cooking*. (Chapel Hill, North Carolina: The University of North Carolina Press, 1985), p. 170.]

Answer:

Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Peanuts are a member of the bean family.
 - (2) No members of the bean family are nuts. (unstated)
-

- (3) Peanuts are not nuts.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Peanuts are a member of the bean family.
 - (2) Most members of the bean family are not nuts. (unstated)
-

- (3) Peanuts are not nuts.

Original Passage:

...[Corporations] don't have the same obligations as citizens do; therefore, they shouldn't be entitled to the same rights. [John Keifenheim, Letter to the Editor, *Grand Forks Herald* (North Dakota), January 31, 2010.]

Answer:

Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Corporations don't have the same obligations as citizens do.
 - (2) If corporations don't have the same obligations as citizens do, then they shouldn't be entitled to the same rights. (unstated)
-

- (3) They shouldn't be entitled to the same rights.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Corporations don't have the same obligations as citizens do.
 - (2) If corporations don't have the same obligations as citizens do, then they probably shouldn't be entitled to the same rights (unstated)
-

- (3) They shouldn't be entitled to the same rights.

- 1. ...[Damien] had a Mohawk..., so obviously he liked them. [Matthew Klam, "50 Things a Man Does Not Have to Do Before He Dies: Get a Mohawk," *GQ* (September 2006), p. 370.]
- 2. Dr. Richard Andrews, a Local Food Project panelist and area physician, argued that local food is fresher and therefore contains more nutrients. [Mary Anna Rodabaugh, "Group Cultivates Joys of Locally Grown Food," *Tasley Eastern Shore News* (Virginia), June 6, 2007.]
- 3. ...[Diamonds are] precious stones, and that makes them expensive. [Nareen Manoukian, "Are Diamonds Really a Girl's Best Friend?," *Daily Sundial* (California State University, Northridge), May 10, 2007.]
- 4. [President George W.] Bush will not make America or the world safer; he has been creating terrorists faster than he can kill them. [Richard Dickinson, Letter to the Editor, *Los Angeles Times*, October 10, 2004.]
- 5. Some coaches say revenge is not an effective motivating factor because the emotion is short-lived. [Dean Smith, in Dean Smith and Gerald D. Bell with John Kilgo, *The Carolina Way: Leadership Lessons from a Life in Coaching*. (New York: Penguin Books, 2004), p. 50.]

6. **Note:** *Buster Keaton was an actor, comedian, film director, producer, screenwriter, and stunt performer. He was best known for his physical comedy in silent films during the 1920s.*

I never used a stunt man because stunt men don't get laughs. [Buster Keaton, quoted in James Bacon, *Hollywood Is a Four Letter Town*. (Chicago: Henry Regnery Company, 1976), p. 26.]

7. **Note:** *The speaker is a fictional character, a middle school student named Damon Fields. He is talking about other peoples' attitudes toward him and how they shaped his feelings about himself.*

Golly's Market catered to lowlifes, and I was working there. So I was a lowlife too. [Barbara Kingsolver, *Demon Copperhead*. (New York: HarperCollins, 2022), p. 155.]

8. **Note:** *Southern resident killer whales (also known as orcas) live off the coasts of Washington and British Columbia. Their diet consists almost entirely of chinook salmon.*

Southern resident killer whales are starving because wild salmon runs have been devastated by dammed rivers, streamside development and fishing.... [Brian Soergel, "Suit Seeks Protection Zone as More Orcas Dies," *Edmonds Beacon* (Edmonds, Washington), August 22, 2019.]

9. **Note:** *FDR was Franklin D. Roosevelt, who was president of the U.S. from 1933 until his death in 1945. Joseph Stalin was premier of the Soviet Union from 1941 to 1953.*

If FDR had lived, the cold war wouldn't have developed the way it did, because Stalin would have tried to get along with Roosevelt. [W. Averell Harriman, quoted in Studs Terkel, *"The Good War": An Oral History of World War Two*. (New York: Pantheon Books, 1984), p. 331.]

10. ...President [George W.] Bush is not trying to win the war [in Iraq]. If he were, he would be sending 500,000 troops instead of 21,500. [Mike Geiger, Letter to the Editor, *Los Angeles Times*, January 15, 2007.]

The Method of Counterexample: A Way to Demonstrate Invalidity

Sometimes we sometimes try to point out that an argument uses faulty reasoning by coming up with an example of an argument that is obviously bad but uses reasoning parallel to that in the argument we are criticizing. Consider this informal example, in which the arguer is criticizing reasoning he attributes to supporters of the administration of President George W. Bush:

The apologists [for the Bush administration] keep sinking to new lows. So abuse of detainees is the exception, not the rule. Well, heck, then it's all OK.

That logic is right up there with "Gee, your honor, there were more days when I didn't kill people than days I did. So what's the big deal?"

[Flip Kobler, Letter to the Editor, *Los Angeles Times*, June 21, 2006.]

This kind of criticism is called argument by analogy, and the method of counterexample is a formal version of argument by analogy that applies only to deductive arguments. Let's remember that whether an argument is valid or invalid is determined by the argument's form (or structure or pattern), not by its content. Also, let's recall that for an argument to be invalid means that it has the following characteristic: if all its premises are true, then it is possible for its conclusion to be false. So, one way to demonstrate the invalidity of a specific argument is by making up an example of an argument that has the same form as the argument we start with – and that has premises we all know to be true and a conclusion we all know to be false. This kind of counterexample proves that any deductive argument with the same structure can have the combination of all true premises and false conclusion, and this is exactly the combination of truth values ruled out by the definition of a valid argument.

Let me illustrate this by considering the following example:

(1) If I have wings, then I can fly.

(2) I do not have wings.

(3) I cannot fly.

This argument is an instance (or example) of a particular argument form, so a way to demonstrate that this argument is invalid is to make up another instance of the same form but which has all true premises and a false conclusion. Such an instance is called a *counterexample*. For a counterexample to be effective, both the person who gives it and that person to whom it is given must share the knowledge that the counterexample's premises are all true and that the counterexample's conclusion is false. So, it's not enough for the counterexample to have all true premises and a false conclusion; its premises must be *well-known* truths and its conclusion must be a *well-known* falsehood.

What is the structure of the example immediately above? It is the following:

- (1) If A, then B
- (2) Not-A
- (3) Not-B

Here is one counterexample to the argument form immediately above:

- (1) If elephants are dogs, then they are mammals.
- (2) Elephants are not dogs.
-
- (3) Elephants are not mammals.

We all know that (1) and (2) – the premises of this counterexample – are true, and we also all know that (3) – the conclusion of this counterexample – is false. Thus, this counterexample demonstrates the invalidity of the argument form of which it is an instance, so it demonstrates the invalidity of *every* instance of that argument form, including the instance with which we started:

- (1) If A, then B
- (2) Not-A
- (3) Not-B

The method of counterexample can only be used to prove invalidity, not to prove validity. Since this is about invalidity, which is a concept that applies to deductive arguments but not to inductive arguments, the method of counterexample is not related to inductive arguments. Some arguments by analogy can be used to criticize inductive arguments, but the method of counterexample cannot be used to criticize inductive arguments.

Let's consider another example:

- (1) All dogs are warm-blooded.
- (2) My neighbor's pet is warm-blooded.
-
- (3) My neighbor's pet is a dog.

Again, to demonstrate that this argument is invalid, we need to make up a counterexample that has all three of the following characteristics:

- ◆ our counterexample is an instance of the same argument form as the example we started with,
- ◆ our counterexample's premises are all well-known truths, and
- ◆ our counterexample's conclusion is a well-known falsehood.

Here is a counterexample:

(1) All kindergarten students are human beings.

(2) CSUN's president is a human being.

(3) CSUN's president is a kindergarten student.

Although the method of counterexample can be very effective in ordinary, everyday reasoning, it can also be hard to use because coming up with counterexamples requires a lot of imagination and ingenuity. In Chapter Three, we will learn more formal techniques for proving invalidity that, while they do require learning some rules and paying close attention to detail, do not require any imagination at all.

**PRACTICE PROBLEMS SET 2-3:
MAKING UP COUNTEREXAMPLES**

Instructions: *Each argument in this practice problems set is invalid. For each, make up a counterexample. Your counterexample must (1) be of the same form as the original example, (2) have premises that are all well-known truths, and (3) have a conclusion that is a well-known falsehood. When you're thinking about whether a truth or a falsehood is well known to be a truth or a falsehood, ask yourself whether it's reasonable to assume that all your classmates and I will share the knowledge you have; keep in mind both the differences between majors and between cultures that are represented in your class, and the age difference between you and me. Please check your work on these problems by comparing your answers to the answers at the end of this chapter.*

Sample Problems:

Argument:

- (1) Some physicians are unhappy people.
- (2) Some unhappy people are men.

- (3) Some physicians are men.

Answer:

- (1) Some mammals are animals that can swim.
- (2) Some animals that can swim are fish.

- (3) Some mammals are fish.

1. (1) All people drive cars.
(2) All people are zebras.
-
- (3) All zebras drive cars.

2. (1) If my neighbor's pets are cats, then they are mammals.
(2) My neighbor's pets are mammals.
-
- (3) My neighbor's pets are cats.

3. (1) Some As are easy to get.
(2) Some things that are easy to get are not worth getting.
-
- (3) Some As are not worth getting.

4. (1) Felix ate fish or chicken today.
(2) Felix ate chicken today.

(3) Felix did not eat fish today.
5. (1) No monkeys are elephants.
(2) Some elephants are baby animals.

(3) Some monkeys are not baby animals.
6. (1) No dogs are cats.
(2) Some cats are mammals.

(3) Some dogs are mammals.
7. (1) All Peruvians are South Americans.
(2) No Peruvians are people who can live without oxygen.

(3) No South Americans are people who can live without oxygen.
8. (1) No college students are lions.
(2) No lions are insects.

(3) No college students are insects.
9. (1) If there continues to be a supply of illegal drugs, then drug usage will continue to be common.
(2) If there continues to be a demand for illegal drugs, then drug usage will continue to be common.

(3) If there continues to be a demand for illegal drugs, then there will continue to be a supply of illegal drugs.
10. (1) If there continues to be a demand for illegal drugs, then drug usage will continue to be common.
(2) If there continues to be a supply of illegal drugs, then there will continue to be a demand for illegal drugs.

(3) If drug usage continues to be common, then there will continue to be a supply of illegal drugs.

A Short Recap

In Chapter Two, you have learned the basic concepts used to evaluate arguments and you have started to learn how to apply these concepts. Now you are ready to start using these some of these concepts in a more precise and rigorous way than we have so far. In Chapter Three, we will study formal logical techniques that will allow us to test certain kinds of deductive arguments for validity or invalidity in a way that guarantees we get the right answer about whether the argument we are testing is valid or invalid.

At this point, you should be able to:

- ◆ define *sound argument*
- ◆ define *unsound argument*
- ◆ define *valid argument*
- ◆ define *invalid argument*
- ◆ understand the difference between validity and soundness
- ◆ define *inductive argument*
- ◆ define *compelling argument*
- ◆ define *uncompelling argument*
- ◆ define *strong argument*
- ◆ define *weak argument*
- ◆ understand the difference between strength and compellingness
- ◆ add unstated premises to deductive arguments
- ◆ add unstated premises to inductive arguments
- ◆ make up counterexamples to demonstrate invalidity

ANSWERS TO PRACTICE PROBLEMS FOR CHAPTER TWO

Answers to Practice Problems Set 2-1

1. Unsound, because premise (1) is false
2. Unsound, because invalid and because premises (1) and (2) are both false
3. Unsound, because premise (2) is false
4. Sound
5. Unsound, because invalid
6. Unsound, because premise (2) is false
7. Unsound, because invalid
8. Unsound, because invalid
9. Unsound, because premises (1) and (2) are both false
10. Sound

Answers to Practice Problems Set 2-2

Note: *For many of these arguments, there are multiple correct ways to phrase the unstated premises; I have only given you one correct answer for each.*

1. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Damien had a Mohawk.
- (2) All people who have Mohawks like them. (unstated)
- _____
- (3) He liked them.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Damien had a Mohawk.
- (2) Most people who have Mohawks like them. (unstated)
- _____
- (3) He liked them.

2. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Local food is fresher.
- (2) All fresher food contains more nutrients. (unstated)

(3) Local food contains more nutrients.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Local food is fresher.
- (2) Most fresher food contains more nutrients. (unstated)

(3) Local food contains more nutrients.

3. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Diamonds are precious stones.
- (2) All precious stones are expensive. (unstated)

(3) They are expensive.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Diamonds are precious stones.
- (2) Most precious stones are expensive. (unstated)

(3) They are expensive.

4. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) President George W. Bush has been creating terrorists faster than he can kill them.
- (2) No president who creates terrorists faster than they can kill them will make America or the world safer. (unstated)

(3) He will not make America or the world safer.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) President George W. Bush has been creating terrorists faster than he can kill them.
- (2) Most president who creates terrorists faster than they can kill them will not make America or the world safer. (unstated)

(3) He will not make America or the world safer.

5. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Revenge is short-lived.
- (2) No short-lived emotions are effective motivating factors. (unstated)

(3) Revenge is not an effective motivating factor.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Revenge is short-lived.
- (2) Most short-lived emotions are not effective motivating factors. (unstated)

(3) Revenge is not an effective motivating factor.

6. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Stunt men don't get laughs.
- (2) If stunt men don't get laughs, then I never used one. (unstated)

(3) I never used a stunt man.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Stunt men don't get laughs.
- (2) If stunt men don't get laughs, then I probably never used one. (unstated)

(3) I never used a stunt man.

7. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Golly's Market catered to lowlifes, and I was working there.
- (2) If Golly's Market catered to lowlifes, and I was working there, then I was a lowlife too. (unstated)

(3) I was a lowlife too.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Golly's Market catered to lowlifes, and I was working there.
- (2) If Golly's Market catered to lowlifes, and I was working there, then I was probably a lowlife too. (unstated)

(3) I was a lowlife too.

8. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) Wild salmon runs have been devastated by dammed rivers, streamside development and fishing.
 - (2) If wild salmon runs have been devastated by dammed rivers, streamside development and fishing, then Southern resident killer whales are starving. (unstated)
-
- (3) Southern resident killer whales are starving.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) Wild salmon runs have been devastated by dammed rivers, streamside development and fishing.
 - (2) If wild salmon runs have been devastated by dammed rivers, streamside development and fishing, then Southern resident killer whales are probably starving. (unstated)
-
- (3) Southern resident killer whales are starving.

9. Reconstruction with an unstated premise that makes the argument **valid**:

- (1) If FDR had lived, then Stalin would have tried to get along with him.
 - (2) If Stalin had tried to get along with FDR, then the cold war wouldn't have developed the way it did. (unstated)
-
- (3) If FDR had lived, then the cold war wouldn't have developed the way it did.

Reconstruction with an unstated premise that makes the argument **strong**:

- (1) If FDR had lived, then Stalin would have tried to get along with him.
 - (2) If Stalin had tried to get along with FDR, then the cold war probably wouldn't have developed the way it did. (unstated)
-
- (3) If FDR had lived, then the cold war wouldn't have developed the way it did.

10. Reconstruction with an unstated premise that makes the argument **valid**:

(1) If President George W. Bush were trying to win the war in Iraq, he would be sending 500,000 troops instead of 21,500.

(2) He is not sending 500,000 troops instead of 21,500. (unstated)

(3) He is not trying to win the war in Iraq.

Reconstruction with an unstated premise that makes the argument **strong**:

(1) If President George W. Bush were trying to win the war in Iraq, he would be sending 500,000 troops instead of 21,500.

(2) He is probably not sending 500,000 troops instead of 21,500. (unstated)

(3) He is not trying to win the war in Iraq.

Answers to Practice Problems Set 2-3

Note: *For all of the arguments in this practice problems set, there are multiple correct counterexamples; I have only given you one correct answer for each.*

1. (1) All college students go to college.

(2) All college students are humans.

(3) All humans go to college.

2. **Note:** *Understand the pronoun 'you' as referring to you, the student who is reading this.*

(1) If you are a kindergarten student, then you are a student.

(2) You are a student.

(3) You are a kindergarten student.

3. (1) Some humans are animals that can swim.

(2) Some animals that can swim are not mammals.

(3) Some humans are not mammals.

4. (1) From Northridge, one can take the 405 or surface streets to UCLA.

(2) One can take surface streets from Northridge to UCLA.

(3) One cannot take the 405 from Northridge to UCLA.

5. (1) No cats are dogs.
(2) Some dogs are animals with eyes.

(3) Some cats are not animals with eyes.
6. (1) No Olympic track athletes are cheetahs.
(2) Some cheetahs are baby animals.

(3) Some Olympic track athletes are baby animals.
7. (1) All college students are humans.
(2) No college students are human infants.

(3) No humans are human infants.
8. (1) No cities are tiny towns.
(2) No tiny towns have large populations.

(3) No cities have large populations.
9. (1) If you're a college student, then you're a student.
(2) If you're a kindergarten student, then you're a student.

(3) If you're a kindergarten student, then you're a college student.
10. (1) If Los Angeles is in the U.S., then Los Angeles is in North America.
(2) If Los Angeles is in California, then Los Angeles is in the U.S.

(3) If Los Angeles is in North America, then Los Angeles is in California.

MULTIPLE CHOICE PRACTICE QUESTIONS FOR CHAPTER TWO

1. Is the following sentence true or false?

A valid argument must have all true premises.

- a. Yes, this is true.
- b. No, this is false.

2. Is the following sentence true or false?

A sound argument must have all true premises.

- a. Yes, this is true.
- b. No, this is false.

3. Is the following sentence true or false?

A valid argument must have a true conclusion.

- a. Yes, this is true.
- b. No, this is false.

4. Is the following sentence true or false?

A sound argument must have a true conclusion.

- a. Yes, this is true.
- b. No, this is false.

5. Is the following sentence true or false?

Every argument with all true premises and a true conclusion is valid.

- a. Yes, this is true.
- b. No, this is false.

6. Is the following sentence true or false?

Every argument with all true premises and a false conclusion is invalid.

- a. Yes, this is true.
- b. No, this is false.

7. Is the following sentence true or false?

A sound argument must be valid.

- a. Yes, this is true.
- b. No, this is false.

8. Is the following sentence true or false?

A valid argument must be sound.

- a. Yes, this is true.
- b. No, this is false.

9. Is the following sentence true or false?

An unsound argument must be invalid.

- a. Yes, this is true.
- b. No, this is false.

10. Is the following sentence true or false?

An unsound argument must have at least one false premise.

- a. Yes, this is true.
- b. No, this is false.

11. Pick the multiple choice that correctly completes the following.

Imagine that you recognize a particular argument as valid, but you do not know the truth value of one of its premises. You are asked whether the argument is sound or unsound. You should answer: _____.

- a. "The argument is sound."
- b. "The argument is unsound."
- c. "I don't know."

12. Pick the multiple choice that correctly describes the following argument.

- (1) All snakes are reptiles.
- (2) All reptiles are animals.

(3) All snakes are animals.

- a. This argument is unsound because, although it is valid, it has at least one false premise.
- b. This argument is unsound because, although all of its premises are true, it is invalid.
- c. This argument is unsound because it is invalid and it has at least one false premise.
- d. This argument is sound.

13. Pick the multiple choice that correctly describes the following argument.

- (1) All CSUN students are students.
- (2) All UCLA students are students.

(3) All CSUN students are UCLA students.

- a. This argument is unsound because, although it is valid, it has at least one false premise.
- b. This argument is unsound because, although all of its premises are true, it is invalid.
- c. This argument is unsound because it is invalid and it has at least one false premise.
- d. This argument is sound.

14. Pick the multiple choice that correctly describes the following argument.

- (1) All college students are students.
- (2) You [the person reading this] are a student.

(3) You [the person reading this] are a college student.

- a. This argument is unsound because, although it is valid, it has at least one false premise.
- b. This argument is unsound because, although all of its premises are true, it is invalid.
- c. This argument is unsound because it is invalid and it has at least one false premise.
- d. This argument is sound.

15. Pick the multiple choice that correctly describes the following argument.

- (1) Your Philosophy 100 professor has four legs and bright purple skin.
- (2) Everyone who has four legs and bright purple skin is 100 feet tall.

(3) Your Philosophy 100 professor is 100 feet tall.

- a. This argument is unsound because, although it is valid, it has at least one false premise.
- b. This argument is unsound because, although all of its premises are true, it is invalid.
- c. This argument is unsound because it is invalid and it has at least one false premise.
- d. This argument is sound.

16. Pick the multiple choice that correctly describes the following argument.

- (1) If Long Beach is in California, then Long Beach is in Japan.
- (2) Long Beach is in California.

(3) Long Beach is in Japan.

- a. This argument is unsound because, although it is valid, it has at least one false premise.
- b. This argument is unsound because, although all of its premises are true, it is invalid.
- c. This argument is unsound because it is invalid and it has at least one false premise.
- d. This argument is sound.

17. Pick the multiple choice that correctly describes the following argument.

- (1) If Las Vegas is in California, then Las Vegas is in the United States.
- (2) Las Vegas is not in California.

(3) Las Vegas is not in the United States.

- a. This argument is unsound because, although it is valid, it has at least one false premise.
- b. This argument is unsound because, although all of its premises are true, it is invalid.
- c. This argument is unsound because it is invalid and it has at least one false premise.
- d. This argument is sound.

18. Pick the multiple choice that correctly describes the following argument.

- (1) If Long Beach is in California, then Long Beach is in the United States.
- (2) Long Beach is in the United States.

(3) Long Beach is in California.

- a. This argument is unsound because, although it is valid, it has at least one false premise.
- b. This argument is unsound because, although all of its premises are true, it is invalid.
- c. This argument is unsound because it is invalid and it has at least one false premise.
- d. This argument is sound.

19. Pick the multiple choice that correctly fills in the blank in the following sentence.

A _____ argument is a strong argument with all true premises.

- a. deductive
- b. sound
- c. inductive
- d. strong
- e. compelling

20. Is the following sentence true or false?

A compelling argument guarantees that its conclusion is true.

- a. Yes, this is true.
- b. No, this is false.

21. Is the following sentence true or false?

Sound arguments are the only arguments that give us good reasons to believe their conclusions.

- a. Yes, this is true.
- b. No, this is false.

22. Pick the multiple choice that correctly fills in the blank in the following sentence.

By definition, every _____ argument with an unstated premise is strong.

- a. deductive
- b. inductive

23. Is the following sentence true or false?

By definition, every inductive argument with an unstated premise is compelling.

- a. Yes, this is true.
- b. No, this is false.

24. Assume that the following argument is **deductive**. Identify its **unstated premise**.

(1) Ghostie is a cat.

(2) Ghostie is an animal.

- a. All cats are animals.
- b. Most cats are animals.

25. Assume that the following argument is **deductive**. Identify its **unstated premise**.

(1) Ghost is a cat.

(2) Ghost is not a whale.

- a. No cats are whales.
- b. All cats are not whales.
- c. Most cats are not whales.
- d. Some cats are not whales.

26. Assume that the following argument is **inductive**. Identify its **unstated premise**.

Abraham Lincoln was not a communist, because he was a president of the United States.

- a. No presidents of the United States have been communists.
- b. All presidents of the United States have not been communists.
- c. Most presidents of the United States have not been communists.
- d. Some presidents of the United States have not been communists.

27. Assume that the following argument is **inductive**. Identify its **unstated premise**.

...Bethe ... was ... a third cousin and therefore to be trusted. [Lillian Hellman, *Pentimento*. (New York: New American Library, 1973), p. 7.]

- a. All third cousins are to be trusted.
- b. Most third cousins are to be trusted.
- c. Some third cousins are to be trusted.

28. Assume that the following argument is **deductive**. Identify its **unstated premise**. Note: *The speaker is a fictional character from “The Wizard of Oz,” called the Scarecrow.*

I am only a Scarecrow, stuffed with straw. Therefore I have no brains.... [L. Frank Baum, *The Wizard of Oz*. (1900; reprinted: New York: Grosset and Dunlap, 1963), p. 89.]

- a. Nothing stuffed with straw has brains.
- b. All things stuffed with straw do not have brains.
- c. Most things stuffed with straw do not have brains.
- d. Some things stuffed with straw do not have brains.

29. Assume that the following argument is **inductive**. Identify its **unstated premise**. Note: *The relevant argument in this passage is boldfaced and underlined.*

Life is tougher in the winter [for mountain lions], **when lions need more calories to stay warm, and so they kill more often during the colder months**.... [Jim Williams with Joe Glickman, *Path of the Puma: The Remarkable Resilience of the Mountain Lion*. (Ventura, California: Patagonia Works, 2018), p. 51.]

- a. If mountain lions need more calories to stay warm during the winter, then they kill more often then.
- b. If mountain lions need more calories to stay warm during the winter, then they probably kill more often then.

30. Assume that the following argument is **deductive**. Identify its **unstated premise**.

It is probably true that the least destructive nuclear weapons are the most dangerous, because they make it easier for a nuclear war to begin. [Freeman Dyson, “Reflections: Weapons and Hope,” *The New Yorker* (February 6, 1984).]

- a. If the least destructive nuclear weapons make it easier for a nuclear war to begin, then they are the most dangerous.
- b. If the least destructive nuclear weapons make it easier for a nuclear war to begin, then they are probably the most dangerous.

31. Assume that the following argument is **inductive**. Identify its **unstated premise**.

...[T]he word Mafia came into Carl’s talk, but I had never heard it before and it therefore meant nothing to me. [Lillian Hellman, *Pentimento*. (New York: New American Library, 1973), p. 14.]

- a. If I had never heard the word ‘Mafia’ before, then it meant nothing to me.
- b. If I had never heard the word ‘Mafia’ before, then it probably meant nothing to me.

32. Assume that the following argument is **deductive**. Identify its **unstated premise**. Note: *The argument is in the Gardners' answer to Mrs. E. B.'s question.*

Q: Desi Arnaz, Jr., fathered a child with Patty Duke. Didn't he also father a child with Lisa Minnelli? – Mrs. E. B., Belmont, N.Y.

A: Impossible. Liza (with a "z") has never been a mother.

[Marilyn and Hy Gardner, "Glad You Asked That," *Miami News*, July 24, 1973.]

- a. If Liza Minnelli has never been a mother, then Desi Arnaz, Jr., did not father a child with her.
- b. If Liza Minnelli has never been a mother, then Desi Arnaz, Jr., probably did not father a child with her.

33. Is the following sentence true or false?

The method of counterexample applies only to deductive arguments, not to inductive arguments.

- a. Yes, this is true.
- b. No, this is false.

34. Is the following sentence true or false?

The method of counterexample can be used to prove validity.

- a. Yes, this is true.
- b. No, this is false.

35. Is the following sentence true or false?

The method of counterexample can be used to prove invalidity.

- a. Yes, this is true.
- b. No, this is false.

36. Is the following sentence true or false?

If you [the student reading this] are making a counterexample, it's okay to use premises or a conclusion the truth values of which you know but your audience doesn't know.

- a. Yes, this is true.
- b. No, this is false.

37. Here is an original argument and an alleged counterexample to it. Is the alleged counterexample really a counterexample to it?

Original Argument:

- (1) If an undergraduate student graduates from CSUN, then they have an undergraduate degree.
(2) Mexico's president Claudia Sheinbaum didn't graduate from CSUN.
(3) She doesn't have an undergraduate degree.

Alleged Counterexample:

- (1) If a bicycle is a motorcycle, then it has wheels.
(2) A bicycle is not a motorcycle.
(3) A bicycle does not have wheels.

- a. Yes, the alleged counterexample is really a counterexample to the original argument.
b. No, the alleged counterexample is not really a counterexample to the original argument.

38. Here is an original argument and an alleged counterexample to it. Is the alleged counterexample really a counterexample to it?

Original Argument:

- (1) No pumpkins are citrus.
(2) Some citrus is orange.
(3) Some pumpkins are orange.

Alleged Counterexample:

- (1) No children are adults.
(2) Some adults speak Spanish.
(3) Some children speak Spanish.

- a. Yes, the alleged counterexample is really a counterexample to the original argument.
b. No, the alleged counterexample is not really a counterexample to the original argument.

39. Here is an original argument and an alleged counterexample to it. Is the alleged counterexample really a counterexample to it?

Original Argument:

- (1) Some Californians are surfers.
- (2) Some surfers are skateboarders.
- (3) Some Californians are skateboarders.

Alleged Counterexample:

- (1) Some cats are dogs.
- (2) Some dogs are elephants.
- (3) Some cats are elephants.

- a. Yes, the alleged counterexample is really a counterexample to the original argument.
- b. No, the alleged counterexample is not really a counterexample to the original argument.

40. Here is an original argument and an alleged counterexample to it. Is the alleged counterexample really a counterexample to it?

Original Argument:

- (1) No liquids are solids.
- (2) Some solids are not edible.
- (3) Some liquids are not edible.

Alleged Counterexample:

- (1) No dogs are larger than elephants.
- (2) Some things that are larger than elephants are trucks.
- (3) Some dogs are trucks.

- a. Yes, the alleged counterexample is really a counterexample to the original argument.
- b. No, the alleged counterexample is not really a counterexample to the original argument.

ANSWERS TO MULTIPLE CHOICE PRACTICE QUESTIONS FOR CHAPTER TWO

1. B	16. A	31. B
2. A	17. B	32. A
3. B	18. B	33. A
4. A	19. E	34. B
5. B	20. B	35. A
6. A	21. B	36. B
7. A	22. B	37. A
8. B	23. B	38. B
9. B	24. A	39. B
10. B	25. A	40. B
11. C	26. C	
12. D	27. B	
13. B	28. A	
14. B	29. B	
15. A	30. A	