

## Chapter 2

# Developing and Testing Arguments

### CHAPTER OUTLINE

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### KEY TERMS

Backing	Reasoning by Authority
Claim	Reasoning by Cause
Deductive Argument	Reasoning by Definition
Grounds	Reasoning by Generalization
Independent Arguments	Reasoning by Sign
Inductive Argument	Reservation
Interdependent Arguments	Syllogism
Qualifier	Toulmin Model
Reasoning by Analogy	Warrant

A few years ago, Philadelphia's ban on smoking, The Clean Indoor Air Worker Protection Law, went into effect. Individuals who violate the law in local eating and drinking establishments are subject to a \$300 fine.<sup>1</sup> While Philadelphia's ban on smoking represents a shift in public sentiment away from the rights of smokers and private businesses in favor of the health and safety of the public, concerned citizens on both sides of the issue continue to raise serious and thought-provoking arguments for and against such bans. As we noted in the previous chapter, it is our responsibility as members of a democratic society to make decisions on matters of public policy, whether those policies affect the world, such as the war on terror, or our local communities, such as ordinances against smoking in public places. To meet this important responsibility, we need skills that allow us to participate fully and competently in the discussions and debates that affect our lives and the lives of others.

In Chapter 1, we introduced the concept of argumentation and noted that all arguments consist of a claim and support for that claim. In this chapter, we consider the importance of **reasoning**; that is, how a premise provides support for a claim. We begin with a discussion of how to analyze an argument, breaking it down into its basic parts. Then, we focus on recognizing and testing different types of arguments.

## ANALYZING AN ARGUMENT

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How do we “analyze” an argument? Put simply, we analyze something when we take it apart and study the parts. So, the first step in analyzing an argument is to take the argument apart, to separate the claim from the premise, and examine the basic parts or elements of the argument. Unfortunately, when people make arguments, whether in oral or written form, they rarely, if ever, label the parts for us. For instance, they don’t tell us whether the argument is “inductive” or “deductive,” an important distinction that determines how we should judge the strength of the argument; and quite often they don’t even tell us what the “point” of the argument is (i.e., the claim). One characteristic of being a critical thinker is being able to do this kind of analysis.

### Deductive and Inductive Arguments

All arguments contain a claim backed up by one or more premises, or reasons, which constitute the proof of the claim. For instance, a friend of Brian’s, Gayle, tries to convince Brian to buy a plasma TV because they have a sharper picture than LCD TVs. In this case, we can take Gayle’s argument apart as follows:

**Claim:** *You (Brian) should buy a plasma TV, because\_ . . .*

**Premise:** *Plasma TVs have a sharper picture than LCD TVs*

Notice in the above argument, we presented the claim first and then the premise. The term “because” indicates the sequence: claim-premise. On the other hand, using the term “therefore” indicates the opposite sequence: premise-claim, as stated in the following:

**Premise:** *Plasma TVs have a sharper picture than LCD TVs, therefore\_ . . .*

**Claim:** *You (Brian) should buy a plasma TV*

Of course, the claim in one argument can become the premise in another, and vice versa. For instance, the premise in the above argument becomes the *claim* in the following:

**Claim:** *Plasma TVs have a sharper picture than LCD TVs, because . . .*

**Premise:** *Consumer Reports says that plasma TVs have a sharper picture*

The relationship between a claim and a premise, which represents the reasoning in an argument, depends on whether the argument is deductive or inductive. In a **deductive argument**, the claim must follow from the premises. That is, if we accept the premises, we have to accept the claim. It is a logical necessity. In this sense, the claim in a deductive argument is either *valid* (we must accept it) or *invalid* (we don’t have to accept it). We express these arguments in a distinct form known as a **syllogism**. To illustrate, consider the following:

**Major premise:** *All artists are creative*

**Minor premise:** *Ted is an artist*

**Claim:** *Ted is creative*

In this argument, called a **categorical syllogism**, we must accept the claim if we accept the premises. As illustrated above, we begin with an initial premise (called the major premise) that a class of things (A) share a certain attribute (B), a secondary premise (called a minor premise) that something in particular (C) belongs to that class (A), followed by a claim that this thing (C) possesses the attribute (B). Thus, we can express the argument above as follows:

**Major premise:** *All A's are B*

**Minor premise:** *C is an A*

**Claim:** *C is B*

Two other common types of deductive arguments are disjunctive syllogisms and hypothetical syllogisms. A **disjunctive syllogism** expresses in the major premise an “either-or” relationship between two things that we assume are mutually exclusive (i.e., both cannot exist), and the argument takes the following form:

**Major premise:** *Either A exists or B exists*

**Minor premise:** *A exists*

**Claim:** *B does not exist*

Alternatively, in the minor premise one could assert that *A does not exist*, producing the claim that *B exists*, or one could assert in the minor premise that *B exists*, which leads to the claim that *A does not exist*. Here is an example of a disjunctive syllogism:

**Major premise:** *Either the Phillies won the game or they lost the game*

**Minor premise:** *The Phillies won the game*

**Claim:** *The Phillies didn't lose the game*

A **hypothetical syllogism** (also called a conditional syllogism) expresses an “if-then” relationship between things. The major premise assumes that the presence of one thing, called the antecedent (A), indicates the presence of another thing, referred to as the consequent (B). In a pure hypothetical syllogism, the premises and the claim express “if-then” relationships as a chain of events (i.e., if one thing happens, then another thing will happen). Here is an example of such an argument:

**Major premise:** *If A, then B*      *If you pass the test, you'll pass the course*

**Minor premise:** *If B, then C*      *If you pass the course, you'll graduate in June*

**Claim:** *If A, then C*      *If you pass the test, you'll graduate in June*

In a mixed hypothetical syllogism, only the major premise expresses an “if-then” relationship. There are two valid forms of this argument: (1) when the minor premise *affirms the antecedent*, and (2) when the minor premise *denies the consequent*:

#### **Affirming the Antecedent**

**Major premise:** *If A, then B*      *If it rains, the roof will leak*

**Minor premise:** *A*      *It is raining*

**Claim:** *B*      *The roof will leak*

#### **Denying the Consequent**

**Major premise:** *If A, then B*      *If it rains, the roof will leak*

**Minor premise:** *not B*      *The roof is not leaking*

**Claim:** *not A*      *It did not rain*

The practice of testing a deductive argument involves determining whether or not the claim follows logically from the premises, not whether or not the claim is true. For instance, in both hypothetical syllogisms above, the claims are valid but not necessarily true (i.e., that depends on whether the premises are true). Determining the probable truth of any claim is what we do when testing the strength of an **inductive argument**. In the next section, we discuss the most widely used method of analyzing inductive arguments.

## The Toulmin Model of Argument

What are the basic parts of an inductive argument? Based on the work of British philosopher Stephen Toulmin, our analysis begins by isolating the **claim**, or conclusion in an argument.<sup>2</sup> Of course, a claim without a premise is not an argument, but merely an **unsupported assertion**. Using the Toulmin model, we call the premise the **grounds** for the claim (also called the **data**). Consider the argument we introduced in Chapter 1, used by the Bush Administration to justify the war in Iraq: *Saddam Hussein is a threat to the United States because he has weapons of mass destruction (WMDs)*. This argument clearly states the first two parts of an argument, as we diagram it below:

Grounds	Claim
<i>Saddam Hussein has WMDs</i>	<i>Saddam Hussein is a threat to the United States</i>

The third part of an argument in the Toulmin model identifies the reasoning implied by the grounds and the claim. This is the **warrant** in the argument. In our example above, what unstated premise must you accept in order to accept the claim?

Grounds	Warrant	Claim
<i>Saddam Hussein has WMDs</i>	<i>Saddam Hussein is likely to use WMDs against the United States</i>	<i>Saddam Hussein is a threat to the United States</i>

As you can see, without the warrant, we don't have the reasoning in the argument, which tells us why WMDs in the hands of Saddam Hussein are a threat to the United States. The warrant supplies the missing link in our argument. But the warrant itself needs support because it may be subject to dispute. And the probable truth of the claim may also hinge on the strength of an opposing argument. The Toulmin model considers this analysis by adding three more parts to the argument: the **reservation** (also called the **rebuttal**) represents a likely counterpoint to the argument (e.g., having WMDs may not be a threat without an effective delivery system), the **backing** provides support for the warrant (e.g., citing research on the motives of Hussein), and the **qualifier** indicates how certain we are that the claim is true. The diagram below places these three elements into the argument above:

Grounds	Qualifier	Claim
<i>Saddam Hussein has WMDs</i>	<i>Probably</i>	<i>Saddam Hussein is a threat to the United States</i>
	<b>Warrant</b>	
	<i>Saddam Hussein is likely to use WMDs against the United States</i>	<b>Reservation</b>
	<b>Backing</b>	<i>Unless the Iraqis have no delivery system for the WMDs</i>
	<i>Intelligence reports indicate that Saddam Hussein wants to attack the United States</i>	



## Independent and Interdependent Arguments

The simplest arguments contain a claim, a premise supporting the claim (grounds), and a premise supplying the reasoning in the argument (warrant). But this analysis ignores the fact that most claims do not depend on a single supporting premise (i.e., the grounds). For example, in support of the claim that *dogs make great pets*, we might argue that *they are dependable, affectionate, and intelligent*. In this argument, we have three **independent premises**—we assume that each premise offers a sufficient reason for accepting the claim that dogs make great pets: they are dependable, OR they are affectionate, OR they are intelligent.

In contrast, some arguments contain **interdependent premises**—none supports the claim sufficiently without the others. For example, suppose you claim that *Professor Jones should adopt a new textbook for her Argumentation and Debate course* because (1) *the textbook she requires now is difficult to read* and (2) *other available textbooks are easier to read*. Does each premise offer sufficient grounds for the claim? No. Why should she adopt a new textbook if the one she's using is not difficult to read? And why should she adopt a new textbook if other available textbooks are no less difficult? Together, the premises may offer sufficient grounds for the claim, but each premise standing alone does not.

Some arguments contain interdependent premises because each premise represents a link in a chain of events leading to a supposed result. These cause-effect arguments are only as strong as the weakest link in the chain. For example, take the following argument:

*Violence on TV leads to violence in real life. Research shows that watching a lot of TV distorts our view of how violent the world is. This creates a kind of paranoia that makes people go out and buy guns for protection. And the more guns out there, the more potential there is for violence.*

This argument begins with the claim that *violence on TV leads to violence in real life*. How many premises does the argument contain as grounds for the claim? The answer is three. And notice how each premise is part of a series leading to the next premise and finally to the claim. Clearly, none of the premises alone provides sufficient support for the claim.

## RECOGNIZING AND TESTING ARGUMENTS

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In the opening of this chapter, we referred to the ongoing debate, taking place in communities across the United States, on the issue of smoking bans. Advocates of smoking bans point to the health and environmental risks of secondhand smoke, the ineffectiveness of nonsmoking areas and ventilation systems, and the public support for smoking bans; opponents question the dangers of secondhand smoke, prefer freedom of choice over government intrusion, and point to the economic impact on restaurants and bars. But how compelling are the arguments on both sides and how do we choose among competing claims? To be sure, questions of policy often come down to legitimate differences in values (e.g., health and safety vs. freedom of choice), and we will discuss this matter in Chapter 7. But determining the relative truth of a claim that requires critical thinking involves assessing the strength of evidence and reasoning. In the next chapter, we discuss types and tests of evidence; here we focus on that part of an inductive argument we too often take for granted—the reasoning. Below, we identify the most common types of reasoning along with the questions we should ask about how well the reasoning supports the claim (i.e., types and tests of reasoning).

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## Reasoning by Authority

**Reasoning by authority** bases the truth of a claim on the credibility of an external source. A speaker might argue, for example, that secondhand smoke is dangerous because the Surgeon General says it's dangerous. The reasoning asserts that the source, the Surgeon General, is both competent and trustworthy. Consider a second example, using the Toulmin model:

Grounds	Warrant	Claim
<i>In a recent editorial, The Philadelphia Inquirer endorsed a smoking ban</i>	<i>The Philadelphia Inquirer is a credible authority on the issue of smoking bans</i>	<i>Smoking should be banned in bars and restaurants</i>

In this argument, the claim that smoking should be banned in bars and restaurants depends directly on the grounds that the newspaper, the *Philadelphia Inquirer*, favors such bans. The warrant or reasoning in the argument tells us why the grounds are sufficient: the newspaper is a competent and trustworthy source of information on the topic of a smoking ban.

The test for this type of reasoning asks whether the source is, in fact, sufficiently credible to make the claim. Uncritical listeners too often accept the word of a so-called authority at face value. But there are two key questions all of us should raise.

First, is the source a legitimate authority on the subject? For instance, while we expect the *Philadelphia Inquirer*, like any newspaper, to express an opinion, the opinion doesn't necessarily carry greater authority than that of any informed citizen. Particularly on matters of fact (e.g., the effects of secondhand smoke), we should always try to distinguish between a primary source and a secondary source. Getting information from a **primary source** means getting it "from the horse's mouth," so to speak; from the person/s who actually observed the phenomena being reported (e.g., the author/s of a study, the witness to an event). Although **secondary sources** may differ in their credentials and level of expertise, the report of a primary source is much less likely to be misconstrued or distorted.

Second, does the source have any bias on the subject? Critics of the *Philadelphia Inquirer* frequently accuse the newspaper of exhibiting a "liberal slant" in its reporting and in its editorials. Such charges may or may not be true. But the existence of such a bias would be sufficient grounds for questioning the source. For instance, on the topic of smoking bans, we would expect a liberal advocate to endorse government intervention more readily (favor a smoking ban) and a more conservative or libertarian advocate to more eagerly choose the free market (oppose a smoking ban).

## Reasoning by Definition

**Reasoning by definition** bases the truth of a claim on the essential features or nature of something. Implicit in this type of reasoning is some criteria on which to draw an interpretation or render a judgment. For example, opponents of smoking bans argue that patrons choose to visit bars and restaurants that permit smoking and are free to go elsewhere if they want a smoke-free environment; so we shouldn't think of nonsmokers as "innocent victims" under these circumstances. We can diagram this argument as follows:

Grounds	Warrant	Claim
<i>Patrons choose the bars and restaurants they go to, and can go elsewhere</i>	<i>Persons who inflict harm on themselves are not innocent victims</i>	<i>Patrons in public places where smoking is allowed are not innocent victims</i>

The test of this reasoning asks whether the definition and/or criteria contained in the argument is appropriate, and whether there are better, more useful, and perhaps less biased definitions and/or criteria. For instance, the argument above implies that we shouldn't be concerned with "protecting" people from themselves—people who are not innocent victims. The reasoning offers a definition of innocent victims as persons who do not inflict harm on themselves. Of course, by this definition, no adult in a bar or restaurant qualifies as an innocent victim because he or she "chose" to be there. But what about people who work in these establishments because they need the money? What about people who do not fully appreciate the health risks associated with passive smoking? Should we not care about their safety? Perhaps a less prejudicial definition of "innocent victims" should include persons who do not intend to hurt themselves.

## Reasoning by Generalization

**Reasoning by generalization** bases the truth of a claim on one or more typical cases, arguing that what is true of some must be true of most. In the argument below, a speaker cites the results of a survey in Missouri to support the claim that most people support a smoking ban.<sup>3</sup>

Grounds	Warrant	Claim
<i>A Missouri survey shows that a majority of the public support a smoking ban</i>	<i>People in Missouri are typical of most Americans</i>	<i>The public favors a ban on smoking in bars and restaurants</i>

The test for this type of reasoning asks whether we can generalize from the cases provided in the grounds of the argument: Are there a sufficient number of cases and are they representative of all or most cases? All surveys, as in the one noted above, rely on this type of reasoning. Scientific surveys use random sampling methods that allow researchers to generalize from what may seem to be a small sample to a large population (e.g., predicting the outcome of a national election based on a sample of 1,500 likely voters).<sup>4</sup> In our argument above, while it may be possible to generalize about people living in Missouri (assuming this was a scientific survey), we cannot generalize about Americans; as a result, the reasoning in this argument is seriously flawed.



The results of surveys and polls rely on reasoning by generalization.

## Reasoning by Analogy

**Reasoning by analogy** bases the truth of a claim on a comparison between two things, asserting that what is true of one is most likely true of the other. Implicit in this type of reasoning is the assumption that the similarities between the two things are more telling than are the differences. For instance, an opponent of smoking bans might say that people will violate a law telling them not to smoke in bars just as often as they now violate a law telling them not to speed on the highways. Another example, diagramed below, assumes a similarity between bars and casinos:

Grounds	Warrant	Claim
<i>Bars have lost a lot of business as a result of smoking bans</i>	<i>Smoking is as necessary for business in casinos as it is in bars</i>	<i>Casinos will lose a lot of business if we ban smoking</i>

The test for reasoning by analogy asks whether the differences between the two things being compared invalidate the comparison. In other words, what's true of one thing may not be true of the other. Think about the two arguments above. The reasoning in the first assumes that rates of noncompliance with a smoking ban will be similar to those of a speeding limit. But are the two sufficiently similar? You could argue that violating a smoking ban is not as easy as violating a speeding limit. In the second argument, comparing casinos and bars, you could challenge the reasoning by arguing that it's easier for people to drink somewhere other than a bar than it is for people to gamble somewhere other than a casino. So casinos may not lose as much business as bars do because smoking may not be as necessary for business in casinos.

## Reasoning by Cause

**Reasoning by cause** bases the truth of a claim on a cause-effect relationship between two things, one leading to the other. In this type of argument, the claim identifies the effect (consequent) and the grounds (premise) implicate the cause (antecedent). Let's suppose an opponent of smoking bans argues that a smoking ban in New York City led to increased unemployment in New York City bars and restaurants.

Grounds	Warrant	Claim
<i>New York City bans smoking in bars and restaurants</i>	<i>New York City's smoking ban causes increased layoffs in bars and restaurants</i>	<i>Layoffs in New York City bars and restaurants will continue to worsen</i>

The test for this type of reasoning directly challenges the cause-effect relationship alleged in the warrant. In this case, does a ban on smoking actually cause unemployment in bars and restaurants? If unemployment is in fact increasing, as stated in the claim, perhaps other factors related to a slowing economy are more to blame. Without sufficient backing from scientifically controlled studies showing a strong association between the ban and the subsequent layoffs, the reasoning in the argument is subject to considerable dispute (see *Post-Hoc Fallacy* in Chapter 4).

## Reasoning by Sign

**Reasoning by sign** bases the truth of a claim on a relationship between two things where one indicates the other. In this type of argument, the indicator (or sign) appears in the grounds (premise), while the thing indicated by the sign appears in the claim. Although we generally hesitate to assume a causal relationship between the sign and what it indicates, this type of reasoning closely resembles *effect-to-cause reasoning* (i.e., the reverse of reasoning by cause). For instance, advocates of smoking bans frequently cite statistics showing decreased smoking in bars and restaurants where smoking is banned, as a clear sign that bans work. A more challenging argument, also using sign reasoning, claims that fewer smokers in bars and restaurants indicate not just compliance with the law, but also that smokers are quitting.

Grounds	Warrant	Claim
<i>There is less smoking in bars and restaurants after smoking bans</i>	<i>Less smoking after a ban indicates that bans encourage smokers to quit</i>	<i>Smokers are quitting in response to smoking bans</i>

The test for this type of reasoning questions whether a sign necessarily indicates one thing in particular more than another. In everyday life, signs can refer to many different things. A sneeze



can indicate an allergy, a cold, or a tickle. As we all know, heavy traffic can indicate an accident, road construction, poor weather, rush hour, or a big event nearby. The same kind of critical thinking applies to policy debates. In the example above, assuming that the grounds are factually correct, and there is less smoking after a smoking ban (not surprising), does that necessarily indicate that smokers are quitting? More likely, smokers are staying away or just not smoking where it's banned. Certainly, we should not accept the reasoning in this argument at face value.

## SUMMARY

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Analyzing an argument, a vital critical thinking skill, means breaking an argument apart and studying the parts. All arguments contain a claim and a premise that supports the claim. The reasoning, often the unstated premise in an argument, shows how the premise supports the claim. One important distinction is between deductive and inductive arguments. Whereas deductive arguments are either valid or invalid, inductive arguments involve some degree of truth. The Toulmin model examines arguments by identifying the claim, grounds, warrant, backing, reservation, and qualifier. We also discussed the difference between arguments containing independent premises and those containing interdependent premises. Finally, we introduced six different types of arguments based on differences in reasoning and identified the tests associated with each: authority, definition, generalization, analogy, cause, and sign.

## NOTES

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- 1 On smoking, you've come a long way, Philly. (2012, November 27). *Philadelphia Inquirer*, A14. Retrieved from Newsbank Web.
- 2 Toulmin, S. (1976). *Knowing and acting*. New York, NY: Macmillan.
- 3 Schlinkmann, M. (2010, September 15). *Survey shows St. Charles County supports indoor smoking ban*. St. Louis Post-Dispatch, MO: Newspaper Source. Retrieved from EBSCOhost website: <http://navigator-wcupa.passhe.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nfh&AN=2W6848657108&site=ehost-live&scope=site>.
- 4 Frey, L., Botan, C., & Kreps, G. (2005). *Investigating communication: An introduction to research methods*. Boston, MA: Allyn & Bacon.

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