Step 2. Develop the Tools of Argumentation

➢ **Concept 1.** Building the Case for a Literature Review

➢ **Concept 2.** Arguments—the Basics

➢ **Concept 3.** Evaluating the Basic Parts of an Argument

➢ **Concept 4.** Understanding Claims

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➢ **Concept 6.** Warrant: Logically Connecting the Evidence to the Claim

➢ **Concept 7.** Complex Claims

Chapter Reading and Learning Strategy

This chapter begins the all-important discussion on argumentation. It describes the basic elements of a simple argument. The concepts and processes presented are abstract and theoretical. Success in this chapter depends upon your accurate recall, developing a clear understanding, and your ability to apply the concepts and definitions learned. The following is a suggested process to assist you in mastering this chapter:

1. Begin by using the SQRRR process to outline your study strategy. Divide the chapter into learning segments—each segment becomes a study session.

2. During each study session, read and study the material for recall and understanding. Take notes using your own words.

3. Once the session reading is completed, conduct a self test on what you know. Compare the results with your notes and the content of the chapter. Adjust.

4. Complete each exercise and correct responses.

5. A study session should end with a reflective oversight episode query about what you learned and your ability to the apply the concepts learned to your own work.

Chapter Learning Outcomes

At the completion of this chapter, you should

- Understand how an argument of discovery and argument of advocacy build the case for the conclusions and thesis of the literature review

- Define the concept of a basic argument

- Understand how an argument of discovery and argument of advocacy build the case for the literature review

- Define the concept of a basic argument

- Understand the elements that make up a simple argument

- Understand the use and validation of the various types of claims

- Understand the difference between data and evidence

- Apply the criteria required to create strong evidence from data

- Understand how evidence builds a claim

- Understand and apply the logic warranting an argument

- Understand how simple claims combine to form complex claims to make up a simple argument
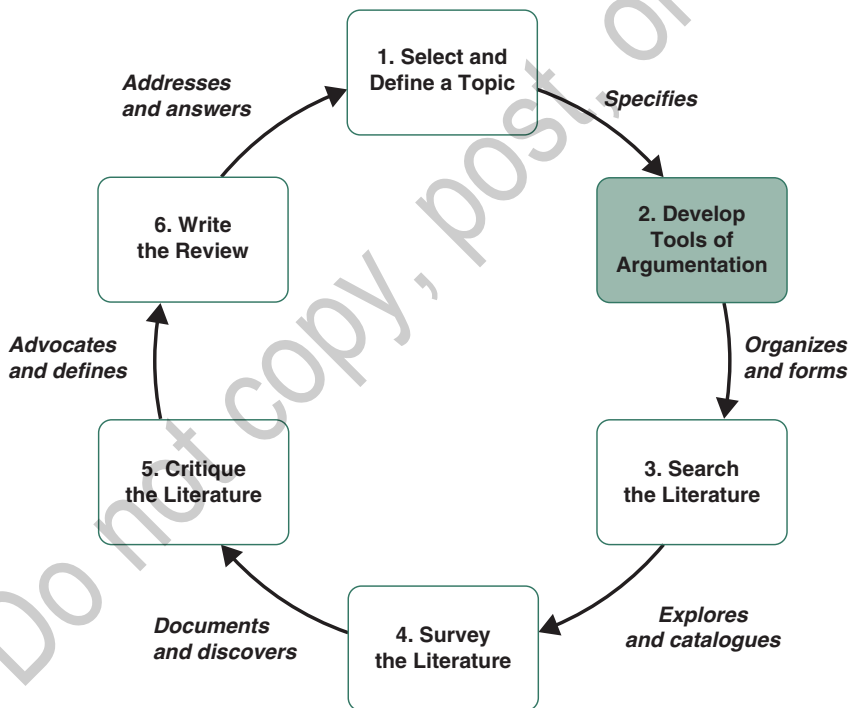
Step 2: Develop the Tools of Argumentation

2

Making the Case for the Literature Review

Quod erat demonstrandum

—That which was to be demonstrated (*QED*)

The Literature Review Model

1. Select and Define a Topic

Specifies

2. Develop Tools of Argumentation

Organizes and forms

3. Search the Literature

Explores and catalogues

4. Survey the Literature

Documents and discovers

5. Critique the Literature

Advocates and defines

6. Write the Review

Addresses and answers

Key Vocabulary

- **argument**: The presentation of one or more claims backed by credible evidence that supports a logical conclusion.

- **argument of advocacy**: Argument based on claims that have been proven as fact and that serve as the premises for logically driving a conclusion—in this case, the thesis statement of the literature review.

- **argument of discovery**: Argument proving that the findings of fact represent the current state of knowledge regarding the research topic.

- **claim**: A declaration of a proposed truth that is open to challenge.

- **complex argument:** Arguments consisting of multiple claims formed to build premises that lead to a major thesis.

- **evidence**: A set of data presented as the grounds for substantiating a claim.

- **inductive argument**: Reasoning that moves from particular instance(s) to a general conclusion. The premises do not cause the conclusion, but the preponderance of evidence makes the conclusion likely or probable.

- **major claim**: A major claim is based on the premises warranted by a complex argument. These premises are based on simple claims and their simple arguments.

- **premise:** A previous statement of factor assertion that serves as the basis for a further argument.

- **qualifiers:** Data that demand rebuttal or concession and refute or limit the claim.

- **simple argument:** Argument composed of a simple claim, its evidence, and its warrant.

- **warrant**: The reasoning used in an argument to allow the researcher and any reader to accept the evidence presented as reasonable proof that the position of the claim is correct.

Chapter Overview

The research topic has been defined, and a clear path has been laid for collecting data. The understandable urge now is to rush headlong into the literature search and begin reviewing the literature. The topic, the

what, of the literature review is clearly defined, but the *how* is still undefined. How does one build an acceptable literature review?

Critical thinking suggests that before a problem such as a literature review can be solved, one must have a way to solve it. For example, what is meant by this: "I am holding up two fingers on one hand and two fingers on the other. How many fingers am I holding up?" This problem cannot be solved unless the process of addition of numbers is understood and employed. What problem-solving process needs to be employed to produce a quality literature review? Clear criteria are found in the definition of a literature review.

> *A literature review is a written document that presents a logically argued case founded on a comprehensive understanding of the current state of knowledge about a topic of study. This case establishes a convincing thesis to answer the study's question.*

A *logically argued case* must be made to produce an acceptable literature review. The pathway, the *how*, to do a literature review now becomes clear. It is a process of argumentation. How does one argue a case about the topic of study that establishes a *convincing thesis to answer the study's question?* The answer to this question is the subject of this chapter.

Chapter 2 presents the foundational concepts necessary for building a case. These concepts cover the elements for making a logical argument. The beginning is an explanation of how arguments are made to build a case. Next is defining the essential elements of any simple logical argument, followed by a detailed explanation of each element. The chapter will conclude with a discussion of how a **complex argument** is constructed.

Apply the conceptual knowledge you learn from this chapter when working on the remaining steps of the literature review process. You might consider referring back to this chapter and using it as a process guide for the review.

Concept 1. Building the Case for a Literature Review

Building a research case means compiling and arranging sets of salient facts in a logical fashion to prove the thesis made about the research topic. For example, if a thesis states participatory leadership is the most effective style for leading a 21st-century organization, the data in the literature review must support and prove this conclusion. The following simple example demonstrates how to build the case for a literature review:

Picture an evening in early spring, when changing weather patterns are unpredictable. You are deciding what to wear to work tomorrow. Should you dress for rain? You look at your cell phone and see that the forecast is for rain. You check the barometer and find the pressure steadily falling. You look outside and see that cloud formations are building. You check back online and see that storms are predicted for the next few days. Considering all the information gathered, you conclude there is a high likelihood for rain tomorrow. You also decide that the available data indicate the rainstorm will probably hit during your morning commute. You apply the results of this research to your question, "What do I wear to work tomorrow?" and decide to wear a raincoat and take an umbrella.

Notice that two conclusions are present in the example. The initial conclusion is, "Rain is likely." This first conclusion was derived using different sources to gather and combine information about weather conditions. The argument for this conclusion was made by analyzing information from different sources and deciding that rain was imminent. Using this conclusion, it now becomes possible to address the question of whether to dress for rain. The second conclusion is, "I should dress for rain." The argument for this conclusion was built by interpreting the first conclusion, "Rain is likely." The results and conclusions of the first argument were applied as the basis for the second. These results reasoned that rain was approaching and that wearing a raincoat and carrying an umbrella would be the most prudent course of action.

How does the rain example apply to writing a literature review? In preparing a literature review, one must present similarly developed arguments to make the research case. An **argument** is the logical presentation of evidence that leads to and justifies a conclusion. The literature review uses two arguments to make its case.

The first argument is an **inductive argument**. Called the **argument of discovery**, its function is to discuss and explain what is known about the subject in question. When building the argument of discovery, gather the data about the subject, analyze it, and develop findings that present the current state of knowledge about the research topic. For example, if the interest is to determine the ideal leadership style for organizations in the 21st century, then the information to be discovered must provide the evidence to argue what is known about leadership styles.

The argument of discovery serves as the foundation for the second argument, an implicative argument, called the **argument of advocacy**. The function of the argument of advocacy is to analyze and critique the knowledge gained from the discovery argument to answer the research question. The answer to this argument is the thesis statement (initially discussed in the introductory chapter).

Continuing with the leadership style example, let's say the discovery argument produced findings that documented many leadership styles and their effective uses. The advocacy argument must use these findings to determine which, if any, of these styles meets the needs of a 21st-century organization. The conclusion, based on the evidence the case presents, is that the participatory leadership style is best in the specific situation named. This conclusion that, "a participatory leadership style is the best fit for a 21st-century organization," becomes the thesis statement. The two types of arguments are presented in detail in the chapters on Step 4 and Step 5. For now, the basic rules for making arguments and building cases need to be examined.

Concept 2. Arguments—the Basics

When considering the word *argument*, you probably think of two people engaged in a dispute. Each is trying to overpower the other's belief, using arguments based on opinion, bias, belief, or emotions. These reasons, however, do not provide a legitimate foundation for a research argument. As seen in the introductory chapter, the use of the rational, persuasive argument is the stock-in-trade of the researcher. This type of argument uses reasoned discussion or debate to separate fact from fiction. Scholarly argumentation is not meant to overpower but rather to persuade and convince. The persuasive argument is logical. It presents a set of claims backed by sound reasons to support a conclusion. The reasons provided build on solid evidence.

The rules of the persuasive argument are simple: If valid reasons are presented that logically justify the conclusion, the argument is sound. If the reasons are not convincing or if the logic applied fails to support the conclusion, the conclusion is unsound. Here is a simple formula:

$$An\ argument = reason_a + reason_b + ...\ reason_n \therefore conclusion.$$

Apply this formula to the weather example presented earlier. Clouds are gathering ($reason_a$), the barometer is falling ($reason_b$), and rain is forecast ($reason_c$); therefore, it will probably rain during the morning commute. "It will rain on our commute" is the thesis of our argument (*conclusion*).

Concept 3. Evaluating the Basic Parts of an Argument

The following four questions provide a handy guide for checking the validity of an argument. Ask these questions whenever you are evaluating an argument.

1. What is the stated conclusion?

2. What are the reasons that support the conclusion?

3. Do the reasons stated have convincing data to support them?

4. Does the conclusion logically follow from those reasons?

A persuasive argument can come in many patterns and can employ sets of reasons formed into logical constructions of many sorts. The types of evidence and supporting data making up each reason can vary as well. However, regardless of the number of reasons presented, the evidence supplied, and the logical reasoning used, the case made must logically justify the conclusion reached. Figure 2.1 diagrams the simple argument.

Figure 2.1   The Simple Argument
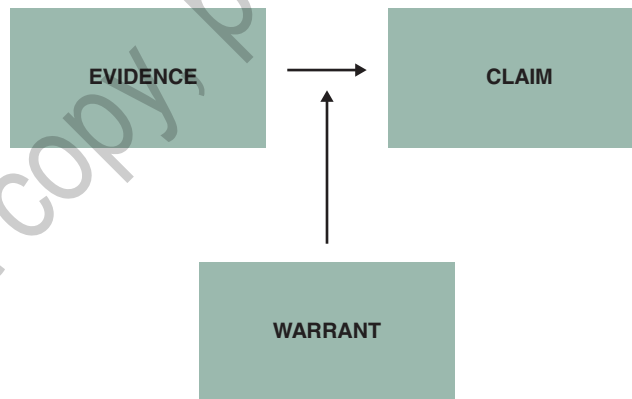
Notice that Figure 2.1 contains the essential parts of a simple argument: the evidence, the claim, and the warrant. **Claims** are declarations of a proposed truth. **Evidence** consists of data that define and support the claim. At the intersection of evidence and claim is the **warrant**. It represents the logical formation of the claims and evidence and is the glue that holds claims and evidence together. The warrant employs a line of logic that justifies accepting the claim. The warrant is the *because* statement. Usually it is indirect (implied), although it can be direct. For example,

- You should not cross the street. (Claim)

- The signal light is red. (Evidence)

- The unstated rule implies that a red signal light means stop. (Warrant)

The simple argument represents the basic building block for making the research case.

Now that you have a general understanding of a simple argument (Figure 2.1), it is time to examine each part of the simple argument in depth. Claims, evidence, and warrants are the subjects for the remainder of this chapter.

Exercise 2.1

A Guided Practice

Review the following arguments using the three questions presented with Concept 3. Write your answers to the three evaluating questions and check your answers against ours, which follow each numbered argument.

Argument 1. Teamwork is necessary to get the job done.

In a group setting, jobs are only completed when teamwork is present. Teamwork and job completion go hand in hand. When groups act as teams, they succeed.

If you analyze Argument 1, applying Question 1, you find four conclusions: (1) teamwork is necessary; (2) completing jobs requires teamwork; (3) teamwork and job completion go hand in hand; and (4) groups acting as teams succeed. These four conclusions are redundant. When you ask the second and third questions, you find that no reasons are present to support the conclusion. Without reasons, there is no argument for the conclusion. The conclusion is unsupported.

Argument 2. Teamwork is necessary to get the job done because individuals need to get their way to be productive.

Individuals need to work independently of one another to produce good work. The central responsibility of a team is to allow all of its

(Continued)

(Continued)

members their own space. Research suggests that individual identity is necessary for a group to remain cohesive. It further suggests that individual identity prevents groupthink and that individuality is the basis for creative work.

When you apply the three questions to Argument 2, you are left with ambiguous conclusions. When you ask the first question, you cannot be sure whether the conclusion is, "Teamwork is necessary to get the job done," or if it is, "Individuals need to work independently of one another to produce good work." When you ask the second question, you find some reasons to support the conclusion that independent action of a group member is essential to group productivity. No data are present, however, to support the reasoning. Finally, when you ask the third question, the reasons given do not support the conclusion. If "teamwork is necessary to get the job done" is the conclusion, the reasons support something different. Argument 2 is not sound.

Argument 3. Teamwork is necessary for a long-term work group to be successful in the group task.

We draw this conclusion based on the following research:

> Study X found that when work groups engaged in group problem solving and collaboration, group communications and productivity increased. Study Y found that when groups engaged in productive interpersonal team skills and behaviors, group performance increased. Study Z measured team development based on individual member understanding of group mission, coordination, and unity. This study found that when these qualities were present in a positive sense, they were predictive of high group performance and productivity.

Argument 3 states a conclusion in the first sentence, thus answering Question 1. The support for this conclusion is cited research. When examining each of the studies, you find that they support the conclusion drawn, thus answering Question 2. When reviewing Question 3, the reasons stated are logical and convincing. All the parts of an argument are in order here, and Argument 3 is sound.

Building an argument is simple. Before you arrive at a conclusion, be sure you can justify it.

Concept 4. Understanding Claims

Claims

The claim is the argument's assertion. It drives the argument. In a persuasive argument, the claim is a declarative statement. A claim asserts a position, an idea that is put forth for consideration and acceptance. The claim made in the weather example was, "Dress for rain."

Chris Hart (2001a), in his text *Doing a Literature Review,* suggests that claims are classified into five types: claims of (1) fact, (2) worth, (3) policy, (4) concept, and (5) interpretation.

Claims of Fact

Claims of fact are statements of proposed truth about a person, place, or thing. Claims of this type are the most often used when building the arguments for a literature review. Examples include the following:

- California ranks 49th among the 50 states in its funding for public education.

- Trans-fatty acids in foods are a major contributor to a high cholesterol count.

Claims of fact must be justified by factual evidence—evidence of truth.

Claims of Worth

Claims of worth propose judgments on the merit of an idea, course of action, behavior, or position over a competing set of alternatives. Evidence of acclamation—that is, evidence that has the strong agreement of others—proves these claims. Examples include the following:

- Life in preindustrial society was morally superior to life in post-industrial society.

- Standardized testing is superior to course grades in determining student knowledge of a subject area.

Claims of Policy

Claims of policy are statements that set criteria or standards, directly expressing what one ought to do. Evidence of acclamation also supports these statements for taking a specific action or adopting a specific position. Examples include the following:

- A policy that penalizes parents of truants by imposing monetary fines should be employed to lessen truancy rates in high schools.

- The best democracy is one that is decentralized and conducts its business locally whenever possible.

As with claims of worth, policy claims demand substantial evidence that demonstrates the course promoted by the stated policy will produce the desired effect stated by the claim.

Claims of Concept

Claims of concept either define or describe a proposition, an idea, or phenomena. These claims are usually definitions justified by expert testimony. Examples include the following:

- Emotional intelligence is an individual's interpersonal and intrapersonal competency in dealing effectively with others.

- Groupthink is a blind adherence to the force of will exercised by key members of the group, discounting any opportunity for consideration of dissenting opinion.

Claims of Interpretation

Claims of interpretation provide a frame of reference for understanding an idea. Expert testimony, empirical research, statistical studies, or anecdotal case studies provide the evidence for interpretive claims. Researchers use claims of interpretation to build models, to synthesize data, and to organize factual claims. Examples include the following:

- Keynesian theory suggests that government economic policy can effectively manage the national economy.

- American Lung Association research concludes that non-smokers exposed to secondhand smoke at work are at increased risk for adverse health effects.

A literature review seeks to answer a research question. That question seeks an answer of fact, judgment, standard, definition, or frame of reference. Figure 2.2 synthesizes these classifications. When beginning a literature review, analyze the type of claim needed to answer the research question. Knowing the type of claim needed signals the appropriate evidence and data needed to successfully make the claim.

Figure 2.2 Categories of Claims and Their Uses			
CLAIM CATEGORY	**TYPE**	**ARGUMENT USE**	**EVIDENCE**
Fact	Statements of proposed truth about a person, place, or thing	Propose a claim of fact	Data verifying documentation
Worth	Statements of judgment of the merit of an idea, course of action, behavior, or position	Propose a course of action, behavior, or position	Supportive documentation by experts
Policy	Statements that set criteria or standards	Propose what one ought to do	Supportive documentation by experts or with anecdotal records
Concept	Statements that either define or describe a proposition, idea, or phenomena	Propose definitions	Supportive documentation by experts
Interpretation	Statements that provide a frame of reference for understanding an idea	Propose a framework for combining concepts	Documentation by expert testimony, empirical research, statistical studies, or anecdotal case studies

Source: Toulmin (1999)

Claim Acceptability

The reader must have a reason to take a claim as an acceptable assertion, given the question posed. In their 1995 text, *The Craft of Research*, Booth, Colomb, and Williams discuss the four criteria that make strong claims. These criteria are paraphrased in Figure 2.3.

Figure 2.3 The Four Criteria for an Acceptable Claim	
CRITERIA	**CRITERIA CHARACTERISTIC**
1 **On point**	Relates directly to argument.
2 **Strong**	Gives a compelling reason.
3 **Supportable**	Evidence is available to justify the position.
4 **Understandable**	Specific. Clearly stated.

Here is a simple example of a claim that meets the four standards. You are taking a long trip by car, and you notice that the gas gauge is reading low. You ask yourself, "Should I fill the gas tank now or later?" and you claim, "I should stop at the next gas station and fill up."

This claim is *on point* because it addresses the question posed. It is *strong* because running out of gas would be a major impediment to the trip. The claim is *supportable* because your gas gauge reads nearly empty. Based on your experience, you know you do not have enough gas to reach your destination. Finally, the claim is *understandable* because it is presented clearly and precisely. You need to fill the tank now.

Here is an example of a claim that fails to meet the standards. You are taking a long trip by car, and you notice that you are getting low on gas. You ask yourself, "Should I fill the gas tank now or later?" and you claim, "I should have my oil changed." This claim is not acceptable because it is not on point (changing the oil fails to address the observation that you are running out of gas). It is not strong (because it does not provide a compelling argument for an oil change). It is not supportable (because the evidence suggests buying gas), and it is not understandable (because there is no clear relationship between the observation and the conclusion).

Here is a thesis that might appear in a literature review: "Student classroom success is directly related to positive classroom social interaction." What would an acceptable claim look like that addresses this thesis? For instance, the following claim could be made: "Individual student classroom success can be directly attributed to a positive interpersonal relationship with the teacher." To decide claim acceptability, apply the four points from Figure 2.3.

1. *Is this claim on point?* Yes, since the claim states that a positive interpersonal relationship with the teacher promotes student achievement, it addresses one aspect of positive classroom social interaction.

2. *Is this claim strong?* Yes, this standard has also been met because the claim provides confirmation of one critical part of classroom interaction, teacher-student relationships, and adds value to the case.

3. *Is this claim supportable?* Yes, there are reasons here that support the claim.

4. *Finally, is this claim understandable?* Assume that key terms and core ideas have been defined. The claim statement

specifically defines actor (interpersonal relationship), action (causes), and result (student success). This idea can be clearly observed and analyzed, and thus it is understandable.

Concept 5. Building Evidence

The validity of a claim depends on the evidence provided. Evidence is the second leg of the simple argument (Figure 2.1). As claims drive the argument, so evidence propels the claim. Evidence is a set of data presented as the grounds for backing up a claim. One cannot simply assume a claim is true in an argument. Failing to provide supportive evidence, or simply using personal opinion or belief as grounds, renders the claim unfounded, and the persuasive argument fails.

Data Versus Evidence

Data and evidence are not the same. Data are pieces of information. Information is value free and makes no judgment. It simply is. Evidence is data collected for a purpose—data with an agenda. Evidence is the basis for the proof of the claim. How do data become evidence?

To address a claim, a search must be made to seek out relevant data. Once compiled, these data must be arranged in such a manner that the position taken by the claim is supported. Selecting relevant data and compiling them to support the claim transforms data into evidence. Data alone do not signal proof. However, data, when selected and crafted as evidence to support a particular viewpoint, justify a claim. The quality and relevance of the data will control their value as evidence. How data become evidence can be demonstrated by using the rain example presented earlier in this chapter. The forecast is for rain; barometric pressure is steadily falling; cloud formations are building. When taken together, these data become the evidence that rain is likely.

Data Quality

Data quality refers to the strength and credibility of the data as good evidence. High-quality data build strong evidence.

- High-quality data are accurate. They present a true picture of the phenomenon being studied and are an unbiased report of an objective observation.

- High-quality data are precise. They present an exact measurement, description, or depiction of the phenomena.

- High-quality data are authoritative. They are a product of sound research practice.

For example, the following piece of data might be cited as part of a research study:

Study X, an explanatory case study, was conducted in a high-wealth school district with ninth-grade African American students from moderate income to wealthy families. This study sought to explain the reasons for African American student success and failure in algebra classes. The research found that the study population of students failed at the same rate as did their African American counterparts on the national level. It was also found that a positive interaction between the algebra teacher and the student was the major factor attributing to student success. Poverty was not a determining factor for success. Students who did well cited their relationship with their teacher as a major reason for their success while failing students cited the lack of this relationship as a major reason for their lack of success.

- *Are the data accurate?* You review the study and find that its methods for doing the research were sound. The study was conducted in a rigorous fashion. Its findings were validated. Based on this information, you are satisfied the data are accurate.

- *Are the data precise?* In reviewing the study, you find the interviews with teachers and students followed a strict protocol. The interview questions were structured and were based on well-defined characteristics. Trained interviewers conducted the interviews, and experts outside the study validated the findings. The data were precise.

- *Are the data authoritative?* In reviewing the study's design, method, and procedures, you find the study followed the standards prescribed for case study research. Based on this assessment, you find the data to be authoritative.

Data Relevance

Data must also be relevant. To be relevant, data must meet two standards: Data must be appropriate, and data must be proximate.

Data are *appropriate* when they match the context of the claim.

For example, if the claim is making a statement about secondary school teachers' opinions about standardized testing but the data report the

opinions of elementary teachers, then the data are not a match. Elementary teachers are a different population of educators; therefore, their data do not necessarily represent the population that the claim addresses. The data are not relevant.

Data are *proximate* when they provide an accurate account of the phenomena observed. The vantage point or proximity of the observer controls data relevance. The *proximate standard* addresses the accuracy of the data observation. Was the account firsthand or based on secondhand information? Were the data the result of primary research or secondary research that relied heavily on the research of others? Primary data from rigorous research have the best connectivity and are the most convincing.

For example, let us say that a claim makes the statement that more than 75% of elementary school teachers find standardized testing to be of little or no help in planning their curriculum. This claim is based on the results of a national survey of elementary school superintendents (i.e., the data). Because the research did not directly seek elementary school teachers' opinions, the data are not proximate. This research is weak because at best it is a secondhand account. We do not know whether its findings provide a true picture.

Qualifying the Claim

Building a strong claim requires that you present all sides of the debate. Rarely, if ever, is evidence for a claim one-sided. That is, in building evidence to support a claim, you will find data that support your claim and data that oppose your claim. Data that oppose the claim qualify it by either negating or narrowing the claim. Data that narrow the claim either limit the conditions of the claim or the scope of the claim. Data in these instances qualify the claim; they refute or limit the claim. These **qualifiers** demand rebuttal or concession.

An example of negating data could look something like this:

> The ABC study showed the target population rating in the 76th percentile in approval of the president's foreign policy. However, when the XYZ study administered a similar questionnaire under the same conditions to the same population, a significant difference was found. Approval had dropped to the 52nd percentile.

The data are contradictory, and their conclusions are in dispute. These studies negate each other.

Narrowing data qualify a claim's assertion. Qualifiers that limit conditions narrow a claim to specific circumstances. In this instance, claims can be narrowed by demographics, age, gender, ethnic background, or locale. Viewpoints such as personal experience, personal beliefs, or professional role can also narrow claims. Here is an example of narrowing data: "When given a survey, executive-level managers rated employment compensation as the chief determinant of their job satisfaction. When given the same survey, midlevel managers rated a collaborative work environment as the most significant determinant of job satisfaction." Here the claim asserting a specific reason for job satisfaction presents mixed results. The population surveyed expressed two preferences, compensation and collaborative work environment. The claim must be qualified to assert both viewpoints.

Limiting the scope of the claim narrows the claim's area of assertion. Usually, a universal assertion claiming a single position of fact is not possible. Claims are always qualified to adequately represent the contradicting data uncovered.

The literature review builds the case to advocate a thesis position. The case is built on multiple claims supported by acceptable evidence. In almost every case, this evidence will present more than one side of the issue. Thus, the resulting claims made must set conditions, limits, or boundaries for the thesis, therefore qualifying the thesis.

For example, based on the data gathered, the evidence shows that student achievement is mainly the result of positive interaction between students and teachers. However, we also find that factors such as economic background, student and family expectations, academic competency, and peer influences play significant roles in student success. These factors provide limits or boundaries for the thesis and qualify the statement that student achievement is based on positive interaction between the teacher and student.

Concept 6. Warrant—Logically Connecting the Evidence to the Claim

You cannot just present data without organizing them in some reasoned fashion, so the data now become the evidence that logically justifies the claim. Remember, evidence is data with a purpose. The warrant is the connection between the evidence and the conclusion. It is the *because* statement. It is the response to the following sentence: "Based on the evidence presented, the claim made is reasonable and legitimate because . . ."

A warrant frames the evidence by using some rule of logic to draw a reasoned conclusion, thereby justifying the claim. The warrant is the third leg of the simple argument (Figure 2.1).

The term *warrant* takes its definition from early medieval use. As used by monarchs, a king's warrant granted its holder certification to perform certain duties under the authority of the crown. The warrant was a letter of guarantee, a license, and a permit. It allowed the holder safe port and safe passage.
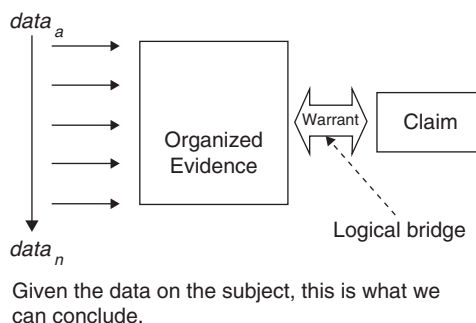
The warrant, as used in the persuasive argument, certifies the argument's safe passage to make its claim. The warrant is the logical license, the rationale that justifies the legitimacy of the evidence as reason to make the claim, making the argument work. Warrants are logical rules of thinking and are seldom stated directly. Remember the example used earlier: "Stop; the light is red." The evidence (the light is red) and claim (stop) are presented here, but the warrant is not. The implied warrant here is the rule—a red signal light means cross traffic has the right of way and we are not allowed to proceed. The statement "The light is red" provides the justification for the claim to stop.

A warrant creates the logical bridge that validates and connects a pattern of evidence in such a way that the reader is persuaded to agree with the conclusion made by the claim. Figure 2.4 illustrates the place of a warrant as the logical bridge in the simple argument.

You can discover the warrant of an argument by asking, "What is the reasoning used in this argument that allows me to accept the evidence presented as reasonable proof of the claim?"

For example, a claim is made stating that a well-balanced breakfast should be made available to children in elementary schools. The evidence for this

Figure 2.4   The Simple Argument: The Logic of the Argument

$data_a$

Organized Evidence

Warrant

Claim

Logical bridge

$data_n$

Given the data on the subject, this is what we can conclude.

Exercise 2.2

Organizing the Argument

Take time now to check your understanding of organizing an argument. We repeat Argument 3 in Exercise 2.1 for you to practice using this tool. Write your answers to the questions that follow and check your answers with ours that follow.

1. What is the evidence given?

2. What is the stated claim?

3. Review the argument. What is the warrant? What is the reasoning behind the warrant?

Studies X, Y, and Z were used as reasons (evidence) to support the conclusion (claim), "Teamwork is necessary for a long-term work group to be successful in completing the group task." Here are our answers to the questions:

1. The evidence that supports the claim is the various studies cited.

2. The claim is, "Teamwork is necessary for a long-term work group to be successful in completing the group task."

3. The warrant is implied. The implication is that expert evidence agrees. Therefore, there is a logical bridge (the warrant) between the evidence and the stated conclusion that teamwork is necessary for group productivity. The logic of the warrant implies that all the evidence points to the same conclusion. Therefore, the conclusion must be correct.

claim comes from many research studies that show children are more attentive and more mentally prepared to begin the school day when they have had a nutritional breakfast. What reasoning is used to justify the claim? In this case, the reasoning used is that the evidence proves the claim beyond a reasonable doubt. If the evidence is sound and it overwhelmingly supports the claim, then you have to agree with the conclusion.

The reasoning behind warrants creates the logic of the argument. Chapter 4 discusses these reasoning patterns and how they are used.

Concept 7. Complex Claims

So far, this chapter has dealt with the basics of argumentation using the simple argument. A **simple argument** is a single claim, its evidence, and its warrant. Most arguments are complex. Complex
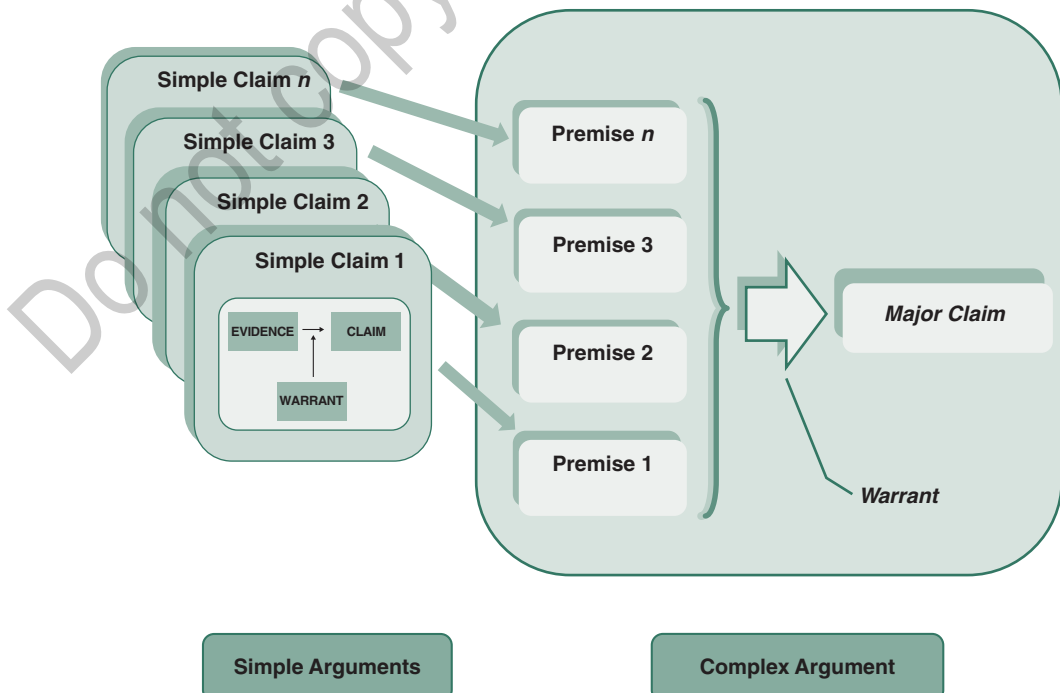
arguments are constructed using multiple simple claims. These simple claims serve as the premises of the major argument. A **premise** is a previous statement of fact or assertion (claim) that serves as the evidence for warranting the claim of a major argument. Build complex arguments as follows:

- First, build the simple arguments, using data for each as evidence to justify its claim.

- Then, use the claims produced by these simple arguments as the premises to build the evidence necessary to justify the major claim of the complex argument.

For example, there are two simple claims: "Young women commit fewer classroom infractions than young men," and "Young women are more adaptable to social situations than are young men." These two claims lead to what we call a **major claim**: "Among all students, male and female, the best-behaved students are female." Notice that these simple claims, when added together, provide the foundation (evidence) for the complex argument and, when taken as fact, lead to a conclusion, the major claim.

A model for the complex argument is seen in Figure 2.5.

Figure 2.5   The Development of the Complex Argument

Simple Claim *n*

Simple Claim 3

Simple Claim 2

Simple Claim 1

EVIDENCE → CLAIM

WARRANT

Premise *n*

Premise 3

Premise 2

Premise 1

Major Claim

Warrant

Simple Arguments

Complex Argument

As seen in the figure, simple claims provide the building blocks for the complex argument. Each simple claim becomes a premise of the complex argument. The premises act as the data for the complex argument. When logically organized, they form the evidence for complex claims. The warrants used for justifying the complex arguments can take many acceptable forms and will be explained in depth in Chapters 4 and 5. But, before leaving this topic, let us examine a complex argument in depth.

The rain example presented earlier in Concept 1 is a simple representation of a complex argument. The following analysis shows its simple arguments and how they become the premises to justify the argument's major claim. For example, picture an evening in early spring, when changing weather patterns are unpredictable. You are deciding what to wear to work tomorrow. Should you dress for rain? You look at your cell phone and see that the forecast is for rain. You check the barometer and find the pressure steadily falling. You look outside and see that cloud formations are building. You check online and see that storms are predicted for the next few days. When considering all the information gathered, you conclude there is a high likelihood for rain tomorrow. You also decide that the available data indicate the rainstorm will probably hit during your morning commute. You apply the results of this research to your question, "What do I wear to work tomorrow?" and decide to wear a raincoat and take an umbrella.

Problem identification is clear: "Should you dress for rain?" Using critical thinking to determine the solution, relevant data are sought out. Each data point becomes a simple argument.

- You look at the newspaper and see that the forecast is for rain. The forecast is a claim made based on the meteorological evidence assembled by the newspaper staff. Newspaper forecasts have been 95% accurate in the past, which provides your warrant for accepting this simple claim.

- You check the barometer and find the pressure steadily falling. You have looked at your home barometer and found that barometric pressure has fallen from 29.72 to 29.45 over the last 6 hours. Because readings like this indicate the pressure drop is rapid, there is a good likelihood that a low-pressure system is approaching, and there is a greater chance of rain.

- You look outside and see that cloud formations are building. Your observation, that the clouds are thickening rapidly, indicates a good possibility of rain in the near future. You base your conclusion on your prior experience in similar circumstances.

- You check online and see that storms are predicted for the next few days. You click on the weather app on your tablet. The extended forecast also shows rain approaching. This forecast is based on meteorological evidence supplied from the National Weather Bureau. These forecasts have a 99% accuracy rating and provide the justification for accepting this claim.

The four claims, each based on a simple argument, now become the data to form the evidence, the premises, to respond to the question, "What do I wear to work tomorrow?" The conclusion is the major claim, that it would be wise "to wear a raincoat and take an umbrella." The warrant for the conclusion, though unstated, should be obvious. It is an *additive rule of logic*. If all of these things point to the same conclusion, then the legitimacy of its claim is high. We accept the conclusion *because* all of the simple arguments, the premises, point to the same conclusion—dress for rain.

Notice that the two types of arguments presented in Concept 1 are also present here. The four simple claims make up the argument of discovery. Applying the additive rule of logic to these premises, warranting the major claim, the conclusion, makes the advocacy argument. Chapter 4, Surveying the Literature, discusses in detail how a literature survey culminates in the development of the discovery argument. Chapter 5 will explain how the critique of the literature leads to the advocacy argument.

Reading the explanation of the last example might have proved to be a tedious task. The simple fact is that the mental gymnastics of simple claim and complex claim formation are the processes that drive our critical thinking every day. We do hundreds of these gymnastics in the course of our waking hours. We do them without reflection and perhaps at a speed faster than light. They are the mental tools we use to navigate our lives. When formally applied, they become tools to argue a literature review

Tips

1. As you progress through your literature review, document the evidence for each claim. This is much easier than going back to search for lost evidence.

2. Check Figure 2.3 often to ensure that your claim types match your argument use and your evidence.

3. Be sure your claims are warranted.

Summary

A successful literature review builds a well-argued case using logically framed arguments. Claims, evidence, and warrants make up logical arguments. A good argument proves its claims. To do this, each claim must be built on credible evidence that validates its assertion. Relevant and credible data provide strong evidence.

Because data provide evidence to justify a claim's assertion, it is your obligation to present all sides of the question. Finally, the warrant supports a claim by using a logical justification to tie the evidence to that claim. Warrants use implied reasoning as justification for a claim.

Simple claims are used as evidentiary building blocks to create complex arguments. These become the premises for justifying the central claim or thesis. Complex arguments are built in two stages. The first stage builds simple claims. The second stage organizes those claims into a body of premises that become the evidence for justifying the complex claim.

At this point, you should have a fundamental understanding of the use of argumentation. How is it applied in a literature review? How do you, as the researcher, make use of arguments to survey and critique the literature? What are the strategies for successful argumentation of a case? These topics are addressed in the next three chapters.

Checklist

Task   *Completed*

Checking Your Simple Argument

1. Make a list of your simple claims. ☐

2. Check that each claim meets the criteria for acceptability. ☐

3. List the evidence that supports each simple claim. ☐

4. Check how your data are organized as evidence. ☐

5. Are your data strong and credible? Check the standards. ☐

6. Are your data relevant? Again, check the
   appropriate standards. ☐

7. Properly qualify your data. ☐

8. Warrant each simple argument. ☐

Checking Your Complex Argument

1. Make a list of your preliminary conclusions.   ☐

2. List the premises that support each conclusion.   ☐

3. Do the premises justify (warrant) your conclusions?   ☐

Reflective Exercise

A. Your Mindset

This chapter contained complex abstract concepts and practices that are critical to the development of a literature review. Given this context;

- Were you able to maintain focus as you read each concept?

- Did you persist in your efforts to gain a deep understanding of the concepts and procedures explained in this chapter?

B. Check for Understanding

- Do you comprehend how the argument of discovery and the argument of advocacy function in building the case for a literature review?

- Can you define the concept of a basic argument?

- Do you understand the elements that make up a simple argument?

- Do you understand the use and validation of the various types of claims?

- Do you understand the difference between data and evidence and what criteria are required to create strong evidence from data?

- Do you understand how evidence builds a claim and what creates the logic of the argument?

- Do you understand how simple claims combine to form complex claims?

C. How Am I Learning?

- What study skills or tools were most affective in aiding you to apply the concepts of this chapter to your own research?

- Were you continually doing a check for understanding while reading this chapter?

- Can you apply the learning from this chapter to construct simple arguments?

D. Reflect to Correct

- What do you still need to know to successfully apply the basic tenets of the simple argument?

- Are you confident in your understanding of the concepts of this chapter to proceed to the next chapter? If not, what remediative steps must you take in order to become competent in the subject?