Chapter 2 – Analyzing Arguments

2.1 Introduction

Now that we have gotten our "mental muscles" warmed up, let's see how well we can put our newly acquired concepts into practice. Having stretched our thinking about thinking, we have come to the point of realizing that thinking well is the acquired skill of reasoning well and that reasoning well is in turn the acquired skill of arguing well. As such, it would be correct to say that good arguments constitute the heart and soul of good reasoning. Accordingly, in our training to become good thinkers, it is of great importance that we stretch our knowledge of arguments just a little further. Ultimately, we need to learn how to distinguish a good argument from a bad one, but we must take first things first. We need to acquire the ability to recognize an argument, good or bad, when we see or hear one.

This ability to recognize an argument when you see or hear one is the most basic skill you will need to acquire in order to become a good, or a better thinker. Your first impression might be that this is not a very refined skill, for arguments are usually very easy to spot. But, as you will see, this is not always the case. To get us warmed up for the hard cases, we will start off with some easy ones. We will begin by pointing out a few things that will help you get better at spotting arguments.

As always, we are going to take it slow, for as every good coach knows, running before you are ready can be hazardous to your health. We begin with this acknowledgment: however important it is to be able to recognize an argument when you see or hear one—and it is Very Important—acquiring this ability is still just the beginning step in developing our reasoning skills. After we have identified an argument, we must go further and analyze it by identifying the premises and the conclusion. And after we analyze the argument, we must go even further and evaluate it as a good argument or a bad one. When we get to this stage we will be up and running. Well even the longest race begins with one step. So let’s get started.

The early 20th century Oxford philosopher J. L. Austin is famous among philosophers (along with his contemporary at Cambridge, Ludwig Wittgenstein) for reminding us that language has many uses. Austin once gave a series of lectures entitled, How to Do Things with Words. He suggests that words are instruments, and are intrinsically connected to tasks. At the time of these lectures, Austin and Wittgenstein were emphasizing the much-neglected pragmatic dimension—the “use” dimension—of language. These insights were revolutionary since many philosophers (including Wittgenstein himself in his early period) had fallen into the mistake of thinking of words as names and sentences as combinations of these names. The mistake here was in thinking that sentences either assert propositions or are meaningless. On this standard view that words stand for the things that they name, that sentences are combinations of such names, and that the propositions they express stand for some relation between the things referred to, or if you will, it was assumed that the primary function of language was to state facts. For example, the sentence “The cat is on the mat” was thought to picture a relation between the cat and the mat; or, as we might say, it was thought to represent the fact that the cat is on the mat. Such a proposition was judged to be true only if it accurately represented the facts. Austin claimed this standard view committed what he called the descriptive fallacy. Indeed, Wittgenstein himself repudiated this view of language in his later work.

Left out of this standard account of language was the fact that speaking and writing are task-oriented activities. As Austin pointed out, when human beings speak or write they are using words to do something. He did not
deny that language is often used to state facts, or to represent them. He did insist however, that it is not language itself that represents things, but human beings who represent things with language. But his most profound innovation was his insistence that the activity of stating facts is but one among the many and diverse activities carried out with language.

For our purposes, the moral of Austin’s (and Wittgenstein’s) revolutionary insight is simple: language has many uses!

While logicians may acknowledge the multiplicity and diversity of language uses, their primary interest remains rather limited. Insofar as logicians are interested in evaluating arguments as either valid or invalid, and given that by definition validity involves a relation between premises and conclusions such that the only valid arguments are the ones in which the truth of the conclusion necessarily follows from the presumed truth of the premises, whether or not any of these components are in fact true. As such it should be clear that a formal argument requires that its premises and conclusion have truth values. Because the obvious candidates for this role are propositions that are by definition either true or false, formal arguments must by definition be composed of proportions.

To put this again in terms of use we can say the following: when we use a sentence to assert a proposition, we have a clear case of what we will call the **informative use** of language. In order to recognize when language is being used in this way, that is, when it is being used to assert propositions, we must learn to distinguish the informative use of language from its many other uses.

But first I need to say more about the informative use of language. We need to be clear about this informative language function. This is important for formal logic, since without it we would lack the building blocks of arguments, that is, proposition. Of course we use propositions to construct arguments. In asserting propositions and in constructing arguments, the speaker’s or a writer’s primary intention is to report, describe, or otherwise convey to a particular audience some information. Most commonly, to use language in this way is to make claims (true or false) about some state of affairs in the world. For example, if someone says, “The cat is on the mat,” that person is most likely asserting that some state of affairs does in fact exist in the world.

If that intention is primarily to inform the audience of something, it does not matter whether the proposition being asserted is in fact true or false, only that it is one or the other. For example, if I say to you, “The cat is on the mat,” I am certainly intending to inform you of the whereabouts of the cat. This would still be my primary intention, even if it turned out that what I said is in fact false, that is, even if the cat were not on the mat. And even if I know that the cat is not on the mat and nevertheless assert that she is, that is, if I am lying to you, I am still using language in its informative function. I am asserting a proposition. In this case, however, my intention is to misinform you. Nevertheless, even here, my primary intention is to convey information, albeit in this case, false information. That is, propositions may be false, even if they are asserted as true.

Most commonly, the informative function of language is at work in forming what we call empirical propositions. These propositions are taken to represent or describe some state of affairs in the natural world. They are sometimes true and sometimes false, but never both. Such propositions are the chief interest of science, since it is assumed that the job of science is to represent and describe the natural world, or if you will, to capture the way the natural world truly is, objectively speaking. As well, some think we can extend this empirical model to make assertions (true or false) regarding non-natural features of reality (for example assertions about values, or beauty) and even to make assertions about supernatural features of reality. In all of these cases, the litmus test as to what does or does not count as an informative use of language, that is, what does nor does not count as a proposition, is the question of whether or not this use is intended to inform us as
to whether or not some state of affairs does or does not actually exist. If this test is passed, we have a genuine proposition, and as such a primary building block that can be used in the construction of an argument.

But allow me to add a qualification regarding the informative use of language. Sometimes language is used to talk about itself. Following Ludwig Wittgenstein, we can call these grammatical or logical remarks. Such remarks do not inform us of any worldly facts, but tell us instead something about what it does and does not make sense to say. That is, these remarks do not represent some state of affairs (natural, non-natural, or supernatural) in an external reality but inform us of how logic works. If I said "it is raining" this is clearly an assertion and clearly an empirical proposition since it refers to some factual state of affairs. But if I say that it is either raining or not raining, I do not inform you about the weather. To say something like this is to utter what we will learn to call a tautology. It has the form of saying “either P or not P.” This utterance cannot be false and logicians call it the law of excluded middle.

Wittgenstein compares such tautologies to equations in mathematics. He calls these equations pseudo propositions because they say nothing. But he also says they are not nonsense and indeed are useful since they tell us how propositions can be combined. The law of excluded middle tells us that any proposition “P” can sensibly be combined with its negation to produce the following tautology: “Either P or not P." We can call this tautology a logical or grammatical proposition to contrast it with empirical or empirical-like propositions. So even though these logical propositions tell us nothing about the world, they do inform us of something important about how logic works. As always true, they satisfy the requirement that informative propositions must be true or false.

Later we will also learn that some logical remarks are always false. We call these logically informative propositions contradictions. They inform us that certain combinations of positions do not make sense. For example, they inform us that it makes no sense to assert: “It is both raining and not raining at the same time and in the same place.”

So even though these logical propositions do not inform us about anything in the world, they do inform us of how propositions can be combined. As such we can class these propositions as "logically" informative and include them (along with empirical or empirical-like propositions) as the building blocks necessary for the construction of arguments.

2. 2 Languages Uses

In this chapter, you will learn to identify some of the more common uses of language that are not primarily informative uses. And what makes them not primarily informative uses of language is that they are not open to being evaluated as either true or false. These broad categories of non-informative uses language will include the following:

- Informative
- Expressive
- Directive
- Performative
- Ritual

Identifying these different uses is often not an easy matter. Skill in doing so will only come with attentive practice. We must develop an ear, as it were, for picking out which use is most prominently involved in the
passages we are interpreting. Recognizing the primary use that a particular sentence is intended to have requires close attention
to context and content. And again, developing this skill in recognizing differences in languages uses will take practice.

Non-Informative Language Uses

1. The Expressive Use
In our earlier discussion we tried to make it clear that not every sentence is used to assert a proposition. Indeed, we quite often use sentences for purposes other than asserting propositions. A very common example of such a use of language is what we will call its expressive function.

Consider this example: Someone says, “I am so sorry your cat is ill. Please accept my sympathy.” It should be clear to you that the primary function of these sentences is not to inform someone of something. There is little, if any, intention to assert propositions here, despite the fact that some information is conveyed (information about the health of the cat, the psychological state of the speaker, and so forth). Rather, in this case, the speaker’s primary interest is not to inform, but to express his or her emotions or feelings. Because such sentences are not used primarily to assert propositions, and as such have no content that can be evaluated as true or false, such sentences would not ordinarily figure in the construction of arguments.

One caution: Don’t be misled by the use of “express” here, for while all uses of language may be considered “expressions”—even the assertion of propositions—we are using the term “expressive” in this context as roughly equivalent to the ideas of venting, revealing, manifesting, evoking, or provoking feelings. We use language in this expressive function when we are trying to vent our own emotions or when we are trying to evoke emotions in our audience, or both.

As an example of the use of language both to vent and to evoke feelings, consider this: “I'm horrified (over the fact that she didn’t feel any pity for her sick cat)! What a shame!”

2. The Directive Use
Here we have yet another task that language is used to accomplish. In this case the task is to get someone to do, or not to do some action. Suppose someone says: “Take your cat to the veterinarian!” It would be a mistake to think that this person was trying merely to convey information or to express his or her feelings. Rather, in this case the speaker’s primary intention is to provoke action in his or her audience; as we might put it, the speaker here is issuing a command or an imperative. We call this the directive language use. The speaker has not made an assertion, so the sentence that expresses the directive is neither true nor false.

Accordingly, directives do not ordinarily form a part of arguments. However, even though such directives are neither true nor false, it does make sense to appraise them as, for example, appropriate or inappropriate, warranted or unwarranted, loving or hateful.

One caution: There is a difference between the sentence “Take your cat to the veterinarian!” and “You ought to take your cat to the veterinarian.” The latter sentence does express a proposition, for it does express some claim that is either true or false. Consider this example: Someone notices that your cat has a runny nose and watery eyes. He says to you, “These are symptoms of feline upper respiratory infection. This is a serious feline illness. A veterinarian may be able to help your cat recover. You ought to take the cat to the veterinarian.” Now we have an argument. The conclusion of this argument is intended to cause some action, but also to inform the cat owner of some course of action that the facts call for. Such arguments have often been called
practical syllogisms or practical arguments, since their conclusions do serve the practical function of informing us of what course of action we ought to take.

What this example also makes clear is that one and the same sentence can involve more than one language use. Indeed, more than two functions can be present. With a certain urgency of voice, I may well add the expressive function to my claim and directive: “Take your cat to the veterinarian right now!” Because language uses can be combined in this way, we have made a point to refer to the “the primary intention” of a speaker or writer in determining the primary language use at play in the particular passage under investigation. Accordingly, we will identify the language use of a sentence as informative, expressive, or directive if that function is the primary one. Making this identification does not preclude acknowledging that other functions may also be at play in the passage that is being interpreted.

3. The Performative Use
It was J. L. Austin who helped to bring our attention to the performative language use. As he pointed out, in successful performative utterances we accomplish an action in and through the saying of certain words. Here we must not be confused by the fact that all language uses involve doing things with words, for example, informing, directing, venting. The performative language use is a special case of doing things with words. In the case of the performative language use, some particular action is accomplished in and by saying certain things in certain circumstances.

Consider the act of making a bet or a promise. The way that we engage in these actions is by saying certain things in certain circumstances with the appropriate sincerity, etc. The way that I engage in the act of betting you something is by saying to you, “I bet you…” If you agree, and you are competent, sincere, and so forth, the bet is on. Similarly, the way that I promise you something is by saying certain words to you with the appropriate earnestness and with your willingness to trust me. Usually, I say, “I promise…”

While such performative utterances are neither true nor false, and accordingly cannot be used to construct arguments, they certainly can be assessed as being successful or not. For example, just saying the words, “I bet you,” is not sufficient for engaging in the act of betting, for among other things, you must agree to enter the wager. Lots of things can go wrong. If you do not agree, my attempt to bet you something fails: I said the words, “I bet” but I did not bet you.

4. Ritual Use
The ritual language use is very closely related to the performative function. As in the case of the performative, the ritual function may involve the accomplishment of some deed by the use of words. For example, in saying the words of the pledge of allegiance to the flag, we may well be doing something, namely, pledging our allegiance to our country. But we need not be doing this. Indeed we might just be going through the motions of a ritual. This use of language marks it off from the performative in an important way. We put this difference as follows: unlike its performative cousin, in its ritual function, words are not used to bring something about.

There are countless such ritual uses of language, for example, saying a prayer, saying "Good-bye," saying "Happy Birthday," toasting newlyweds, and so forth. Normally, when we say to someone “How ya doing?” this is not an inquiry into his or her well-being, but a ritual greeting. We engage in the act of greeting someone by saying these words. The words, we might say, constitute a kind of handy formula for greetings. Of course we can greet each other differently, with different words, but when we adopt commonly accepted formulas, we are using language in its ritual function. Perhaps you can think of some further examples of this ritual use of language.
2.3 Recognizing Propositions

Recall that even though propositions are most often asserted using sentences, not all sentences serve to express propositions. It follows from this that not every group of sentences is also a group of propositions. And of course if a given passage does not contain at least two propositions, it certainly could not contain an argument. So we are going to have to do some digging to determine whether a given group of sentences does or does not add up to an argument.

As we have seen, asserting a proposition is to use language to inform someone of something. Or as we might say, to assert a proposition is just to say something that is either true or false. Obviously then, it is important to a logician to be able to recognize when a sentence is intended to provide information and when it is not. So then, to judge that a sentence is intended to say something that is either true or false, regardless whether it is in fact true or false, is just to judge that this sentence expresses a proposition. My concern now is that you master the skill of recognizing when a sentence is and when it is not being used in this informative function of asserting a proposition. This is important, of course, if we are to improve our skills at recognizing whether or not a group of sentences is used to express an argument.

There are some helpful hints in developing this skill of recognizing propositions. For one thing, you need to note that it is possible that a group of sentences in some given passage that you are reading or hearing, may not contain any propositions at all. Just as well, it is also possible that every sentence in the passage you are exploring expresses a single proposition. And, of course, a passage may contain a mix of sentences, some of which do, and some of which do not, express propositions. In addition, sometimes we find that different sentences in the same passage may be used to express the same proposition, and that the same sentences in the passage are being used to express different propositions. And finally, it may be the case that a single sentence may contain multiple propositions but assert only one. Moreover, given the fact that a single sentence can contain multiple propositions, it is possible for a single sentence to contain an entire argument.

Some examples of each of these possibilities will prepare you for the exercises in the Workbook.

I. The following passage contains a group of sentences in which no proposition is expressed.

John, do you think that Picasso was a painter or a writer? Please answer this question. Why don't you answer me?
John, were you listening? Will someone please give John some help here?

II. The following passage contains a group of sentences in which every sentence expresses a different proposition.

If we go to the movies tonight, then we will not be able to go to the fair. But if we go to the fair, then we will not go to the movies. I want to go to both. I can't make up my mind.

III. The following passage contains a group of sentences some of which express propositions and some of which do not.
Can you help me? If I get married then I will regret it. If I do not get married I will regret that. However, I must do one or the other. Tell me what to do?!

IV. The following passage contains two different sentences that are being used to express the same proposition.

The Atlanta Braves won the World Series in 1995.
The Braves won the Fall Classic in 95.

V. The following passage is one sentence which may be taken as containing several propositions but which does not contain an argument.

The cows are in the meadow and the sheep are in the corn, but either the cows will come home or the sheep will go to sleep.

VI. A proper analysis will reveal that the following sentence contains three different assertions that can be used to construct an argument (a valid one at that).

I am going to the movies because if I do not go, I will regret it, and I have no regrets…

VII. The following passage is a single sentence that contains two propositions but asserts only one.

Since I am under oath, I must tell the truth.

We need to make a distinction between propositions that are asserted and propositions that are contained in an assertion. We count these differently. Example VI above allows us to see that even though this sentence contains several different propositions, it asserts only one. In other words, the proposition asserted has one truth value and this depends on the truth values of the component propositions that are contained in this one assertion. If no proposition is contained in a sentence then the sentence cannot be used to assert anything. As we will come to understand more formally in later chapters, the sentence above is a conjunction, that is, a sentence which connects two more simple propositions with the word “and” or “but” or the like. Each of these parts expresses a proposition in the sense that it is either true or false.

In example V above, the proposition “the cows are in the meadow” is either true or false, just as “the sheep are in the corn” is either true or false. And the same could be said for the last part of the sentence: “the cows will come home” and “the sheep will go to sleep” both contain claims that are either true or false. (Later we will make a distinction between simple and compound propositions and this should help to make it clear that there is a difference between the propositions that are asserted and the propositions that are contained in the assertion.

In the Exercise Workbook, you will be asked to count the propositions that are asserted in a given passage. Here is a template for helping you make this distinction:

1. “The cat is on the mat.” This sentence asserts only one proposition and it contains only one proposition.
2. “The cat is on the mat and the dog is in the yard;” “Either the cat is on the mat or the dog is in the yard;” “If the cat is on the mat, then the dog is in the yard,” Each of these sentences expresses only one proposition but each contains two propositions.

It is plausible to take example VII above as a short-hand expression of an argument. If we allow that "since" identifies a premise, this passage can be taken as containing (implicitly) the following propositions and argument structure: 1. “I am (now) under oath” (premise). 2. “When I am under oath, I must tell the truth” (unstated premise). 3.”I must (now) tell the truth” (conclusion).

2.4 Recognizing Arguments

After we have determined that passage we are analyzing contains a group of propositions, we must then press on to see whether one of them is claimed to follow from the others. Recall that our criterion for determining whether a group of propositions expresses an argument is as follows:

<table>
<thead>
<tr>
<th>Argument:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A group of propositions is an argument if and only if some of the propositions (the premises) are asserted as supporting the truth of another of the propositions (the conclusion)</td>
</tr>
</tbody>
</table>

In our daily conversations, groups of propositions are seldom explicitly labeled as arguments. Moreover, groups of propositions are often used for purposes other than expressing arguments. Some passages contain a series of assertions that function as descriptions or as explanations.

The skill of recognizing differences among the various uses of propositions is more of an art than a science. But there are clues for which we can look. Sometimes authors or speakers are very kind to us and make it quite clear that they are presenting an argument. The most common such clues are found in words such as “therefore” and “hence.” When these words are used, there can be little doubt that the author or speaker intends to convince you of something. In these cases, we are clearly being presented with an argument. Such word-hints are called by logicians “conclusion indicators.” As a general rule, the proposition following a conclusion indicator is supported by the other propositions; that is, what follows a conclusion indicator is the conclusion of the argument itself. The following list includes some of these terms. Can you think of others?

<table>
<thead>
<tr>
<th>Some Conclusion Indicators:</th>
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<tbody>
<tr>
<td>So</td>
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<tr>
<td>Hence</td>
</tr>
<tr>
<td>Therefore</td>
</tr>
<tr>
<td>It follows that</td>
</tr>
<tr>
<td>Consequently</td>
</tr>
<tr>
<td>Thus</td>
</tr>
<tr>
<td>For these reasons</td>
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</tbody>
</table>

With these clues in hand, it would be hard not to recognize the following as an argument.

*Since all men are mortal and Socrates is a man, it follows that Socrates is mortal.*
Other word-hints also help in recognizing arguments. These terms we call “premise indicators.” They tell us that a particular proposition is being offered as support for the conclusion. Again, we will begin a list for you, but we encourage you to add to it:

<table>
<thead>
<tr>
<th>Some Premise Indicators:</th>
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<tbody>
<tr>
<td>Since</td>
</tr>
<tr>
<td>Because</td>
</tr>
<tr>
<td>For</td>
</tr>
<tr>
<td>As</td>
</tr>
<tr>
<td>If</td>
</tr>
<tr>
<td>Insofar as</td>
</tr>
</tbody>
</table>

Please note that these premise and conclusion indicators are merely indicators; they are not guarantees that an argument is being expressed. Consider the following example in which “since” is not used as a premise indicator:

“Since John has been home from college he has been deeply depressed.”

Now it should be obvious that this sentence does express a proposition, but that it does not express an argument. Indeed the term “since” is used in this case to express a temporal duration and not a reason that John is depressed.

However, the following would be an argument:

“John must love college, *since* he gets so depressed whenever he leaves.”

In this case, the fact that John gets depressed when he leaves college is offered as a reason for thinking that it is true that John loves college.

Similar things can be said about most of the premise indicators. In general, premise indicators are less reliable than conclusion indicators; and some premise indicators are less reliable than others. This is especially true of the term "because." We see this clearly when we discuss the difference between an argument and an explanation.

And there are other qualifications that we should notice. Some passages that we are investigating may express arguments even though there are no premise indicators and no conclusion indicators. In these cases, we will have to depend on other clues. In other cases, there are parts of the argument (premises or conclusions) that are left unstated.

Once we have determined that the group of propositions we are investigating does constitute an argument, then we must go on to ask if it is an inductive or a deductive argument. Remember that an argument is a deduction if the speaker or writer claims that the evidence offered, if true, is sufficient to guarantee the truth of the conclusion; and an argument is an induction if the evidence is claimed to offer some support for the conclusion, but not to compel its truth.

Some groups of propositions, of course, are neither deductive nor inductive arguments, that is, are not arguments at all. Sometimes a group of propositions is intended simply to convey information and sometimes to describe persons, places, or things. For convenience, we shall call all such uses of propositions **descriptions**, using "description" in a very broad sense. Accordingly we define description as follows:
For example, the following is a group of propositions that does not contain an argument: “The cat is on the mat and the dog is in the yard. Or to cite a more poetic description: “As the rain swept softly but steadily across the garden, the flowers drooped as if they were weeping.”

Sometimes a group of propositions masquerades as an argument. The most common of these masqueraders is the explanation. The reason the explanation is so often taken to be an argument is that arguments and explanations have almost exactly the same form. The general form of both is simply this: "C because P" where C is a proposition and P is a proposition. One thing that is confusing here is that both arguments and explanations use the premise indicator word, “because.” However there is an easy way to tell argument and explanations apart. Simply ask yourself this question: "Is the "C" in the "C because P" presumed to be well established? If the "C" is well established, then we most likely have an explanation. If the "C" is in need of being established, then we most likely have an argument. Consider the difference between the following two examples:

A. John must have dropped out of school, because his girlfriend jilted him.
B. John must have dropped out of school because he is no longer included on the list of enrolled students.

In the first case, it seems likely that it is known that John dropped out of school and the fact that his girlfriend jilted him is offered as an explanation of why he dropped out. In the second example whether John has dropped out of school seems uncertain and the fact that his name no longer appears on the list of currently enrolled students is used to show that he has indeed dropped out. Hence, the first example is an explanation and the second is an argument. The difference, again, between an explanation and an argument is as follows:

**Explanation:** C because P is an explanation if the P offers reasons why C

**Argument:** C because P is an argument if the P offers reasons establishing that C

To repeat, the key here is the difference between establishing why (explanation) and establishing that (argument). Again, explanation and argument differ in that explanations presume that C is true and hence does not need to be established as true; and arguments presume that the truth of C is in doubt and hence offer evidence to support C. If there is doubt that an explanation is designed to settle, it is not a doubt that "C" is true, but a doubt as to why it is.

In the first case above, it is implausible to think that the fact that John’s girlfriend jilted him would be offered as evidence that John dropped out of school. There are many break-ups between matriculation and graduation. If, however, we know that he has dropped out of school, we may wonder why he dropped out. In this case, the fact that his girlfriend jilted him may be the correct explanation as to why he dropped out. By the same token, it is implausible to think that the fact that John’s name is no longer on the list of currently enrolled students would be offered as an explanation as to why John dropped out of school. Most likely, the fact that his name is not on the list would be offered as evidence that John has dropped out of school. This is what makes the second example an argument.

Perhaps these distinctions will become clearer as we plunge into some examples in our Exercise Workbook. Indeed, sometimes the best way to learn is simply just to dive in. Before you take the plunge, however, just be aware that the purpose of the author (whether to explain, describe or to argue) in the
passages in the exercises in your Workbook is sometimes difficult to interpret. Indeed, a single passage may fall under more than one of the categories we have delineated above. In fact, the more imaginative you are, the more possibilities you will see. My best advice is simply to identify the passage in terms of the most obvious intention of the writer/speaker.

2.5 Recognizing Good Arguments

As you develop your skill in recognizing arguments, you will be preparing yourself for the important task of distinguishing good arguments from bad ones. But, if you recall the arguments we discussed in the "Foreword," it should be clear that I have been introducing the distinction between good and bad arguments from the very beginning of the course. Now that we have some basic concepts in logic under our belt, let's take a second look at the arguments we introduced in the "Foreword," and add a couple of more. The four arguments introduced in the "Foreword" are as follows:

1. If she loves me, she will call. She loves me. Therefore, she will call.
2. If she loves me, she will call. She will call. Therefore, she loves me.
3. If she loves me, she will call. She does not love me. Therefore, she will not call.
4. If she loves me, she will call. She will not call. Therefore, she does not love me.

Recall that we said that #1 and #4 are good arguments and that #2 and #3 are not good ones. Earlier we gave these arguments names. (#1 is called Modus Ponens; #4 is called Modus Tollens; #2 is called The Fallacy of Affirming the Consequent; and #3 is called The Fallacy of Denying the Antecedent). We are now ready to say that 1 and 4 are valid and that 2 and 3 are invalid.

We can learn something very important and useful from this. We can say in general that any argument with the same form as either 1 or 4 (regardless of its particular content) is valid and any argument with the same form as either 2 or 3 is invalid. Or to put this differently, we can say that any time an argument has an “if/then” proposition as a premise and a premise that affirms or asserts the “if” part of that proposition, we can validly deduce the “then” part (Modus Ponens). Just as well, any time an argument has an “if/then” proposition as a premise and a premise that denies, or negates the “then” part of that proposition, we can validly deduce the negation of the “if” part (Modus Tollens).

Similarly, any time an argument has an “if/then” proposition as a premise and a premise that affirms the “then” part, the argument is invalid (affirming the consequent). And any time an argument has an “if/then” proposition as a premise and a premise that denies the “if” part, the argument is invalid (denying the antecedent).

We can add to these two valid argument forms another very common one that also involves “if/then” propositions. It is called Hypothetical Syllogism. Consider the following argument:

| If he loves me, then he will call me |
| If he calls me, then I will be happy |
| Therefore, if he loves me, I will be happy |

Chapter 2 p.11
This is a valid argument. Indeed any argument of this form is also valid. You must be careful however to make sure that the argument you are analyzing has this **precise** form. Make sure that the “if” part of one of the premises of the argument is the “if” part of the conclusion and that the “then” part of the other premise is the “then” part of the conclusion.

One other common valid argument form involves an “either/or” proposition rather than an “if/then” proposition. It is called **Disjunctive Syllogism**. Consider the following two valid arguments:

| 1. Either she loves me or she will not call She does not love me Therefore she will not call me |
| 2. Either he loves me or he will not call He calls me Therefore he loves me |

Both of these arguments are valid. To put this more generally, we can say that any argument that has an “either/or” proposition as a premise and a premise that denies the “either” part, validly implies the “or” part. And just as well, an argument that has an “either/or” proposition as a premise and a premise that denies the “or” part, validly implies the “either” part.

**Good Arguments Forms**

- Modus Ponens
- Modus Tollens
- Hypothetical Syllogism
- Disjunctive Syllogism

**Bad Arguments Forms:**

- Denying the Antecedent
- Affirming the Consequent

2.6 Analyzing Arguments: Identifying Premises and Conclusions

After recognizing that a passage does in fact express an argument, we are ready to proceed with an analysis of it. “To analyze” something is of course to take it apart, or to break it down into its component elements. As you know by now, the parts of an argument are its propositions. So, once you have recognized that there is an argument expressed in a passage, that is, once you have determined that the passage contains a group of propositions and that one of them is being supported by the others, the first step in the analysis of it is to break it down into its component propositions.

The next step in the analysis of the argument is to identify the particular proposition in the group that the others are supposed to support. That is, the second step is to identify the conclusion of the argument. This is very important, for to miss the conclusion is to miss the whole point of the argument!
After you are satisfied that you have located the conclusion of the argument, you can then proceed to the next step in the analysis. Now you should locate and identify each premise of the argument, that is, the propositions that are offered in support of the conclusion. Next, you should make the structure of their support explicit. Within the structure of an argument premises can work independently in support of the conclusion, or they can work jointly. In making the structure of support explicit, we are helped in understanding the force of the argument.

Finally, we reach the last step. Here we must determine the kind of support the premises are claimed to offer for the conclusion. If the premises are taken to offer only some support, then the argument is an induction; if the premises are taken to offer conclusive support, then the argument is a deduction.

Let’s put this step-by-step analysis into practice. First we will take a very simple example and then move on to a more complex one. Consider first, the following argument:

The threat of terrorism has gotten much worse in America in the wake of September 11th and other domestic terrorist attacks. Since we want to lessen the threat of terrorism, America ought to take stronger measures to protect itself.

In this passage there are several propositions asserted, three to be exact. Plausibly, each of the sentences in our passage can be taken to assert a single proposition. So we do have a group of propositions.

Now, does this group of assertions constitute an argument? It does if the author of the passage is trying to establish that one of the propositions in the group is true on the basis of one or more of the others. I hope you see that the author of this passage is indeed trying to establish a particular claim and is trying to do so on the basis of other propositions in the passage. With this recognition, we are ready for further analysis. Having broken down our argument into its bare propositional bones, we are now ready for the second step in our analysis. We must decide which one of these propositions is being supported by the others. That is, we must locate and identify the conclusion of the argument. We are helped in this regard by our conclusion indicator, “therefore.” As such it should be obvious that the author is putting forth an argument for strengthening America’s defenses against terrorism. As well, the first two sentences assert the propositions that support this conclusion. Moreover, there is little doubt that the author thinks that these premises support the conclusion with necessity. Accordingly, we can be sure that this argument is intended to be a deductive one.

You may recognize that this is a valid modus ponens argument. It has the following form: If terrorism has gotten worse, we ought to strengthen our measures against it: it has gotten worse; therefore we should strengthen our measures against it.

Now let’s move on to a more complex argument.

Money is better spent on heart disease prevention by promoting exercise and good eating habits than in developing new medicines. In the first place, new medicines are usually expensive. In the second place, most medicines are used after one has already developed some form of the disease. By contrast, we don’t have to wait until we get heart disease to exercise and eat right. Finally, we are less likely to get heart disease if we exercise and eat smart.
In this passage several propositions are asserted. Consider the last sentence, for example. It is easy to see that it expresses a proposition, that is, asserts something that is either true or false. Moreover, it is also easy to see that most readers would think that people would be less likely to get heart disease if they exercised and ate right. And we could say similar things about the claim that heart medicines are expensive, or about the claim that exercising and eating smart are habits open to everyone.

Now, does this group of assertions constitute an argument? It does if the author of the passage is trying to establish that one of the propositions in the group is true on the basis of one or more of the others. I hope that you see that the author of this passage is indeed trying to establish a particular claim and that he or she is trying to do this on the basis of other propositions offered as reasons. That is, I hope that you recognize that this passage does express an argument.

With this recognition, we are ready for further analysis. Our next task is to break the argument down into its component propositions. So how many propositions do you count? There is room for disagreement on this point, depending on how you break up some of the sentences.

Let’s see how this might look by constructing a list of the propositions in the order of their appearance in the passage under investigation.

1. Money is better spent on heart disease prevention by promoting exercise and good eating habits than in developing new medicines.
2. Medicines are usually expensive.
3. Medicines are used after one has already developed some form of the disease.
4. We don’t have to wait until we get heart disease to exercise and eat right.
5. Finally, we are less likely to get heart disease if we exercise and eat smart.

Your list may be differently stated from this one, but this would not necessarily make your analysis incorrect.

What is important here is to capture the basic content of the claims made in the argument. Having broken down our argument into its bare propositional bones, we are now ready for the second step in our analysis. We must decide which one of these propositions is being supported by the others. That is, we must locate and identify the conclusion of the argument. Notice that we do not have a conclusion indicator in this passage. So we must rely on other clues as to the author’s intention. Mostly we must rely on clues that are found in the context of the passage and in the end we must rely on our own common sense.

Let’s see how this step can be applied to the passage we are analyzing. In reading the passage, which one of the propositions that is expressed in it do you think is a plausible candidate for its conclusion? Locating the conclusion may not be easy to do right away. You may have to do some experimenting. Consider, for example, whether the author might be trying to establish that new medicines are likely to be expensive or that they would be administered after the onset of disease. In considering this, you have to ask: “Are there any reasons offered that go toward establishing that either of these propositions is true? There do not seem to be any. Rather, these claims are offered in such a way as to be taken for granted. This fact, moreover, is a clue that these propositions are being offered as evidence for something else, something that is not taken for granted. Hopefully such reflections will lead you to see that the claims that seem to be taken for granted are offered as establishing what is not taken for granted, namely, the conclusion. And
what is the conclusion? It has got to be the claim that in addressing the issue of heart disease, it is a good idea to increase grants used to promote smart eating and exercise rather than to develop new medicines. (Proposition 1) Did you see that this is the conclusion? If you did, or do now, hurrah for you! Hopefully, you also see that all of the other propositions in the passage (2-5) are premises, that is, are used to give support to (1).

Finally, it seems plausible that this argument is intended to establish its conclusion with necessity. Hence, it is most likely intended to be a deduction. However, there is room for disagreement, and the author might intend only to offer an induction.

2.7 Further Analysis

Once we have located the conclusion and the premises of an argument, there is still more work to be done to complete our analysis. We must ask how the premises function in their support role. Premises can work independently in support of the conclusion, or they can work jointly. In deciding these issues there is room for differences in interpretation.

Let’s consider two arguments that neatly illustrate how premises can function independently or jointly. The first argument:

<table>
<thead>
<tr>
<th>If she loves me, she will call me</th>
<th>She will not call me</th>
</tr>
</thead>
<tbody>
<tr>
<td>She does not love me</td>
<td></td>
</tr>
</tbody>
</table>

It should be obvious that this is a good argument, even though it does not explicitly contain wither a premise or conclusion indicator. It should also be obvious that the last sentence asserts the conclusion and that the first two sentences assert premises. It is implausible to suppose that either the first or the second premise alone could count as evidence for the conclusion. In other words, in this argument, the premises are offered as jointly supporting the conclusion. Neither in isolation could reasonably be taken as supporting the conclusion.

Now consider a second argument:

*I should not ask her for a date, since she is married and she hates me.*

Again, it should be obvious that the conclusion of this argument is asserted by the phrase, “I should not ask her for a date.” And the premises are “she is married” and “she hates me.” However, either of these premises alone would support the conclusion. In this argument therefore, we say that the premises support the conclusion independently.

Now let’s go back to our argument about heart disease, exercise, and diet.
1. Money is better spent on heart disease prevention by promoting exercise and good eating habits than in developing new medicines.

2. Medicines are usually expensive.

3. Medicines are used after one has already developed some form of the disease.

4. We don’t have to wait until we get heart disease to exercise and eat right. 5. Finally, we are less likely to get heart disease if we exercise and eat smart.

An analysis of this argument suggests that the structure of support that the premises are offering is as follows: premises (2) and (3) independently support the conclusion (1), premises (4) and (5) jointly support it. The support that (2) and (3) offer to (1), however, is independent of the support that (4) and (5) offer it. Do you agree, or do you have a different analysis?

If you have been following this discussion, you have already realized that conclusions and premises do not have to be asserted in any particular order. Conclusions can be stated first and the premises can come afterwards or vice versa. And just as easily, the conclusion can be wedged between the premises.

Not only do premises and conclusions not have to be in any certain order, it is also true that they don’t have to be explicitly stated at all. The analysis of an argument must take account of any implicit or unstated premise or conclusion, where these implicit propositions are obviously figuring in the argument. Consider the following examples:

John must be very smart, he is a physics major

This argument has an unstated premise. The conclusion is that John is very smart. One reason offered in establishing this claim is that John is a physics major. However, being a physics major, taken in isolation, would offer no support for the conclusion. Obviously, the author of the argument is assuming another premise, namely, that all physics majors are very smart. With this premise now made explicit, clearly we have an argument in which the conclusion must be true if the premises are granted.

In the same argument, we also could have left the conclusion unstated. If someone asked: “Is John smart?” it would certainly make sense to reply as follows: “John is a physics major and we all know that all physics majors are very smart.” And we can even imagine it making sense to respond to the question with another question that implicitly expresses the same argument:

He is a physics major, isn’t he?

Arguments of this type, that is, arguments with unstated parts, either premises or conclusion, are called Enthymemes. When we encounter such an argument, a good analysis will require that we make all of its implicit parts explicit.

Sometimes arguments are connected to each other to form a chain. Arguments get connected in this way by having the conclusion of one argument serve as a premise for a subsequent argument, whose conclusion then serves as a premise for the next one, and so on. Such an argument is called a Sorites.
Consider this example:

If Jane had done her homework in logic, she would have made better grades on her logic exams. Unfortunately, Jane did not do better on her logic exams, so she did not do her logic homework. Jane’s parents get angry when she does not do her logic homework. Therefore, Jane’s parents are angry.

You will notice that in this passage there is one conclusion indicator, in the last sentence, but this need not determine that we have only one argument in the passage. In fact, there are two arguments here and they are tied together to form a sorites. This means that the conclusion of the first argument serves as a premise in the second one. Moreover, you must not assume that because the conclusion indicator is in the last sentence of the passage that the proposition expressed in that sentence is the final conclusion of the two arguments.

Remember, the order of appearance of the propositions in the passage does not necessarily reflect the order of the premises and conclusions in the argument these sentences express. Can you find the arguments? Or more precisely, can you find that particular proposition that is functioning both as a conclusion and as a premise? To make it easier to spot, let’s break the passage down into the basic propositions it expresses. The list would look something like this:

1. If Jane had done her homework in logic, she would have made better grades on her logic exams.
2. Jane did not do better on her logic exams.
3. Jane did not do her logic homework.
4. Jane’s parents get angry when she does not do her logic homework.
5. Therefore, Jane’s parents are angry.

Clearly proposition (5) "Therefore, Jane's parents are angry" is the conclusion to one of the arguments in the passage, since it contains the conclusion indicator “therefore.” So we must ask, what propositions are offered in support of it? If you said propositions (3) "Jane did not do her logic homework." and (4) "Jane's parents get angry when she does not do her logic homework." you would be correct. In fact, when taken jointly, they offer conclusive evidence for the truth of proposition (5).

Now let’s consider propositions (1) and (2). These two propositions taken jointly are sufficient for establishing proposition (3). So (1) and (2) are premises and (3) "Jane did not do her logic homework." is the conclusion of the first argument in this sorites. Then, proposition 3 shifts its function. After having been supported by (1) and (2) and serving as conclusion, it shifts to offering support for (5) and serves as a premise.

So our analysis of this sorites is complete. It is composed of two arguments, and hence has two conclusions. One of the conclusions (3) is supported by propositions (1) and (2). Proposition (3) then serves as a premise, and with proposition (4) is used to support the second and final conclusion of the argument, namely, proposition (5).

Perhaps a few exercises will strengthen our understanding of enthymemes and sorites, as well as strengthen our grasp of the difference between premises that jointly support the conclusion of an argument and premises that support the conclusion independently.

**Enthymeme:** An argument with an implicit part (The missing part can be premise or conclusion) **Sorites:** A chain of arguments formed when the conclusion of every argument (except the last) serves as a premise of a subsequent argument
Study Guide for Chapter 2

Language Uses

Expressive: An expressive use of language is one in which the speaker reveals feeling, attitudes, and such, but does not assert any matter of fact.

Directive: A directive use of language is one in which the speaker commands or encourages listeners to perform some action.

Informative: An informative use of language is one in which the speaker states a matter of fact.

Ritual: A ritual use of language is one in which words are spoken as part of a formal or informal ceremony.

Performative: A performative use of language is one in which the speaker accomplishes something by the speaking.

Kinds of Arguments

Deduction: A deduction is an argument in which the premises are intended to guarantee the truth of the conclusion.

Induction: An induction is an argument whose premises are intended to establish that the conclusion is likely true.

Sorites: A chain of arguments in which the conclusions of earlier arguments serve as the premises of later arguments. Enthymeme: An argument with a missing premise or conclusion.

Groups of propositions often mistaken for arguments

Descriptions: A description consists of one or more propositions that is (are) intended merely to convey information about something.

Explanations: An explanation is intended to account for why something is true that is already known to be true. An explanation is distinguished from an argument in this respect since an argument is intended to establish that something that is not known to be true is in fact true.

Good Arguments

Hypothetical Syllogism: If A implies B and if B implies C, then A must imply C.

Modus Ponens: If A implies B and A is true, then B must be true.

Modus Tollens: If A implies B and B is false, then A must be false.

Disjunctive Syllogism: If “either A or B” is true and A is false, then B must be true; or if “either A or B” is true and B is false, then A must be true.

Bad Arguments

The Fallacy of Affirming the Consequent: If A implies B, and B is true, it does not follow that A must be true. The Fallacy of Denying the Antecedent: If A implies B and A is false, it does not follow that B must be false.