Lecture 6:
The Rhetoric of Logic:
Truth and Syllogisms

The Suggested Reading for this lecture is Howard Kahane and Nancy Cavender's *Logic and Contemporary Rhetoric: The Use of Reason in Everyday Life.*

This is possibly the weirdest lecture in this series, because it is probably unlike anything you were expecting in relation to a course on rhetoric. This lecture, which is about logic, is pretty close to being about math.

But please do not skip ahead. This is very important material, even more so because it is often left out entirely from writing courses and discussions of rhetoric. I think this is a mistake. As Aristotle noted (and Plato and the philosophers before him recognized), logic is an essential part of rhetoric. If you want to convince someone to do something, a logical chain of reasoning is one of the best ways to do this. Although not all human beings follow logical chains of reasoning, and it is very difficult sometimes to find a starting point for such a chain, if you *do* have an enthymeme, you can generally lead a person where you need to go *if you follow a few rules of logic*. In addition, much tricky or dishonest rhetoric actually works by not following the rules of logic. We will discuss various kinds of rhetorical cheating in the next lecture on logical fallacies, but it is worth noting here that each time we discuss how logic *forces* or *proves* some statements to be true, inversions or changes in that logic can make it seem as if false things are in fact true.

Rules of Logic

You can build up the most complex arguments based on just a very few rules.

Identity. A thing is the same as itself; A = A.

Some philosophers argue that this can be a profound problem, but for our purposes, we will take it as a foundation.

If ➛ Then. If it is raining, then the sky is cloudy. If something is a fish, then it lives under water.

Negation. We can say NOT to support the negation of what we were saying before. Therefore we also have NOT A equal to NOT A.

Some uses of these foundational ideas include the following:

Inversion. Adding "NOT" to both sides of a logical statement is called "inversion."

It is very important to note that the inverse of a true statement is not always true.

If it is raining, then the sky is cloudy.

We will assume this is true for now. Putting NOT on both sides results in the following:

If it is NOT raining, then the sky is NOT cloudy.

Note that this is not true. At the very moment that I am writing this, it *is* cloudy and it is indeed not raining.

If it is a fish, then it lives in the water.

But look at the inverse:

If it is NOT a fish, then it does NOT live in the water.

This is not true, as the existence of seals, whales, sea urchins, and other marine life demonstrates.

The Converse. Logical statements have what can be called “directionality” (and this makes them fundamentally different from mathematical equations). The *order* of the IF and the THEN matters. So, although IF A THEN B is true, IF B THEN A is not necessarily true.

If it is raining, then the sky is cloudy.

For our purposes, this is true. But look at the converse:

If the sky is cloudy, then it is raining.

This is not true.

If it is a fish, then it lives in the water.

True, but look at the converse:

If it lives in the water, then it is a fish.

Again, not true, as the statement above on other forms of marine life shows.

Contrapositive. However, if we perform the inverse (add NOT to both sides) and the converse (switch the order), we *do* get something that is true. This is called the contrapositive.

If it is raining, then the sky is cloudy.

Switching the order and adding NOT to each side, we get the following:

If the sky is NOT cloudy, THEN it is NOT raining.

True enough. Let us try the fish example.

If it is a fish, then it lives under water.

So invert and convert, and we get the following:

If it does NOT live under water, then it is NOT a fish.

Also true!

Syllogisms. A syllogism is a collection of multiple “if A then B” statements in which the statements are chained together because the conclusion of the one THEN statement is the IF of another.

So IF it is raining, THEN the sky is cloudy.

IF it is cloudy, THEN I am not casting a shadow.

THEREFORE: IF it is raining, THEN I am not casting a shadow.

Multiple syllogisms may be chained together:

IF it is a fish, THEN it lives under water.

IF it lives under water, THEN it cannot fly.

IF it cannot fly, THEN it cannot get onto my roof.

IF it cannot get onto my roof, THEN it cannot slide down the chimney.

THEREFORE IF it is a fish, THEN it cannot slide down the chimney.

As long as you can keep chaining syllogisms together, you can logically walk your reader or hearer from one point to another.

You will note that this chain of syllogisms uses some negative constructions.

IF it lives under water, THEN it can*not* fly.

You can restate this, for convenience's sake, as

IF lives under water, THEN NOT fly.

And this implies two very important things. First, you can chain any "NOT fly" statement to this one.

IF it can*not* fly, THEN it is not a butterfly.

But, through our knowledge of the contrapositive, we can also rearrange statements to allow them to be linked.

IF it is a seagull, THEN it can fly.

Invert and convert to get:

If it cannot fly, THEN it is NOT a seagull.

And then we can link up this statement to our NOT fly statement from before:

If it lives under water, THEN it cannot fly.

IF it cannot fly, THEN it is NOT a seagull.

Why it might be important to prove this, I do not know, but you can, I hope, see how this gives you a whole lot of flexibility in rearranging a wide variety of statements into syllogism. The contrapositive allows you to switch around a statement and still have it be true. If you have the statement, for example, ostriches cannot fly (i.e., IF it's an ostrich, THEN it can NOT fly) but you find yourself building an argument about things that *do* fly, you can use the contrapositive of the original statement, IF it CAN fly, then it is NOT an ostrich.

Now, let me pre-answer some objection (this, by the way, is the rhetorical figure of prolepsis, which we will discuss in lecture ten): I agree that nobody argues exactly like this. It would be excruciatingly boring. But this kind of structure *underlies* all of the logical arguments we encounter: You start at one step and try to chain things together. Also, this is *traditional* or Aristotelian logic; modern logic does different things. Also note that these kinds of rules don't work for statements like "some cows are brown," only for statements like "all cows eat grass"—you need to have the complete category covered. But even if you would bore your audience beyond tears with a complete (and that is the key word) argument worked out only in terms of logical propositions, you still cannot avoid logic. In fact, you do not want to avoid logical propositions, as the operation of syllogisms can be used in your favor to compel your audience to agree with you.

FOR GREATER UNDERSTANDING

Questions

1. What is an example of a contrapositive?
2. Why is it important to understand the rules of logic when forming an argument?

Suggested Reading

Kahane, Howard, and Nancy Cavender. *Logic and Contemporary Rhetoric: The Use of Reason in Everyday Life.* Belmont, CA: Wadsworth Publishing Company, 2005.

Other Books of Interest

Bergmann, Merrie, James Moor, and Jack Nelson. *The Logic Book*. 4th ed. New York: McGraw-Hill, 2003.

Cicero, Marcus Tullius. *Rhetorica ad Herennium*. Trans. Henry Caplan. Loeb Classical Library, Cambridge, MA: Harvard University Press, 1954.

Walton, Douglas N. *Informal Logic: A Handbook for Critical Argumentation.* Cambridge: Cambridge University Press, 1989.