Lecture One

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June 29, 2021

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1 Administrative issues

1.1 Instructor names

Welcome to the first lecture of Philosophy 201, Introductory Logic. The talking head in front of you belongs to Professor Halvorson, who will be leading this course. There are two other instructors, Roman Altshuler and Alice van t'Hoff. Each one of you will be assigned to one of the three of us as your primary instructor, i.e. the person who will lead your precepts, and who will grade your problem setes.

1.2 From performance to understanding

Speaking of problem sets: unlike other philosophy course, the primary aim of this course is to transform you into a person who is able to Do Symbolic Logic.

There will be ten mile posts, which we call "problem sets", a half way checkpoint, which we call "midterm exam", and a finish line which we call "final exam".

Unlike other philosophy courses, the lectures and precepts for this course are not intended to be events in themselves. Their value will be measured by the extent to which they enable you to reach the mileposts, and eventually the finish line.

So here is how the course will work: each week, we will give you a problem set. Then there will be one or more lecture videos that you can watch to help you figure out what is going on in the problem set, to outline strategies, and occasionally, to present some motivation.

We will also point to corresponding readings from the course textbook How logic works.

Finally, there will be live precepts that give you further guidance about how to do the problems, and a chance to work practice problems under the guidance of an instructor.

So to summarize: the end point is the problem set, and there are four things to help you get there: (1) lecture, (2) reading, and (3) precept, and (4) office hours. Your individual preceptor will give you instructions about how to submit problem sets.

2 Beginning logic

2.1 Arguments

The focus of this course is on arguments, but not the kind that say kids have with their parents. It is about the kinds of arguments that are put forward in every academic discipline, or that one sees in debates. The goal of the course in the most general form is: help you to be better at making arguments and at assessing other people's arguments. But take note: when we use "better" here, we mean it in an objective sense. We do not mean: help you become better at persuading people. Sadly, people are not frequently persuaded by the best arguments. Frequently they are persuaded by flashy arguments, or sleight of hand, or by somebody appealing to their interests, or someone flattering them. Either their is an objective sense or good vs bad in arguments, or all of western civilization (and science) is a sham. I assume that it is not a sham, and so I assume that there is an objective notion of

"good" argument.

Fortunately, I did not have to reinvent the wheel to come up with an account of the objective features that make an argument good. The account we use today goes all the way back to the ancient Greeks who proposed that the notion of "good" in "good argument" can be analyzed into two components: "validity" and "truth (of premises)." But I am getting ahead of myself. Let me first be a bit more clear about what exactly I mean by "argument."

In a technical sense, an argument is made up of **statements**, by which I mean: declarative sentences that could be either true or false. So, in this technical sense, an argument cannot include a question, or a proposal. Now, of the statements that make up an argument, one statement plays a special role: it is the claim that the argument is intended to establish. We call this special statement the **conclusion** of the argument.

In ordinary life, the conclusion of an argument often comes at the end of the argument, but that is not always true. For example, a person can begin by stating their conclusion, and then can proceed to offer evidence for that conclusion.

In most cases, you will not be in any doubt about what the conclusion of an argument is supposed to be. If it is too hard to figure that out, then it is probably the fault of the speaker/writer, and not your own. What's more, in many cases, the conclusion is signalled by words such as:

> hence, therefore, consequently, accordingly, etc.

These words signal that the evidence has been given, and now the result will be stated.

The statements offering evidence in an argument – i.e. the statements intended to support the conclusion – are called the **premises**. So, altogether, an argument consists of a collection of statements called the premises, and another statement called the conclusion. The claim of the argument is that the premises support the conclusion.

2.2   Goodness

Now you know the official definition of an argument, and in the first problem set, we will give you a little bit of practice distinguishing arguments from non-arguments. However, the more difficult and important skill is distinguishing among the arguments between the good and the bad ones. Being able to do

that can very literally make the difference between life or death – or perhaps less dramatically, between success and failure.

The word "good" might sound far too subjective. After all, some arguments feel convincing to one group of people, while not at all to some othere group of people. However, the idea behind this class is that there really is an objective sense of "good" in "good argument." To do this, we will split the notion of "good argument" into two parts.

Good = Sound = Valid + True Premises

Here is the basic equation. First of all, since the word "good" sounds subjective, let's replace it with a technical term "sound." Hence, if an argument is sound, then it is as good as it possibly could be.

The right hand side of this equation needs a bit more explaining. The notion of a "valid" argument is one of the most interesting ideas in western science, although it is not easy to define it precisely. The basic definition involves rewriting the equation above:

Valid = Sound - True Premises

This does not mean that a valid argument does not have true premises. Rather, it means that a valid argument is not guaranteed to have true premises. But more importantly, it means that if an argument is valid, then if it did have true premises, then it would be sound.

To put it one other way: to say that an argument is valid means that if its premises were true, then its conclusion would also be true. That is, a valid argument has whatever feature is needed such that the truth of the premises would guarantee the truth of the conclusion.

These abstract definitions will be easier to understand if we look at a few examples. The first example is an argument that is sound.

All people are mortal. Beyonce is a person. Therefore, Beyonce is mortal.

The second example is valid but not sound.

All people are rich. Bezos is a person. Therefore, Bezos is rich.

Valid arguments can have all combinations of true and false premises and conclusion, except for the case of true premises and false conclusion.

Finally, here is an example of a invalid argument that nonetheless has true premises and a true conclusion.

Some philosophy concentrators are in this class. Some people in this class are female. Therefore, some philosophy concentrators are female.

The reason I can tell that this last argument is invalid is because the premises could have been true while the conclusion was false. For example, suppose that, as a matter of fact, no philosophy concentrators where female.

Then it still would have been possible to have a class with both philosophy concentrators and with female students. So the conclusion does not follow logically from the premises. [Possibly draw the Venn diagram]

2.3 Deductive versus abductive arguments

Now we briefly need to backtrack, just to avoid a possible confusion. I said that the goal of this class is to learn to distinguish between Good and Bad arguments. But let be more clear that there are plenty of "good" arguments that are nonetheless not good in the technical sense I have used the term. Consider, for example, the kind of argument that might be given by a trial lawyer L. Suppose that L intends to argue that A stole the cookies. Then L might bring out various bits of evidence, such as the whereabouts of A on the night of the theft, or some facts about A's known interest in cookies. The jury's job is to decide whether or not L's arguments are good. If they are good, then they will convict A of the crime, and if the arguments are not good, then they will acquit A.

However, no matter how good L's argument is, it is not going to be Sound in the sense we defined above. For example, suppose that L argues as follows:

A told me that he stole the cookies. Therefore, A stole the cookies.

Of course, this argument is not sound – because A could have been lying, or might have misremembered, etc. Even though A's statement might be very good evidence for the conclusion, it cannot be deductively sound evidence.

So, "good" arguments do, in truth, include arguments that are not deductively sound. However, for the purposes of this class, we will focus on the "golden standard", i.e. the case where the premises provide absolutely decisive support for the conclusion. The basic test for validity is: the conclusion could not possibly be false if the premises were true.