

Philosophy 1100: Introduction to Ethics

Critical Thinking – Lecture 3

Background Material for the Exercise on Analyzing a More Complex Argument

Extracting an Argument from a Text

1. An Overview

How does one extract an argument from a passage, and then formulate that argument in a complete and explicit fashion? In outline, the answer is as follows:

- (1) First, look for inference indicators in the passage.
- (2) Secondly, ask yourself, with regard to each inference indicator, which type of inference indicator it is. Is it of the same type as "therefore" - where the inference indicator is followed by the conclusion, and preceded by one or more premises:

[Premise - Inference Indicator - Conclusion]

Or is it of the same type as "since" or "because" - where the inference indicator is followed by one or more premises, and where the conclusion either precedes the inference indicator, or else follows the premise:

[Conclusion - Inference Indicator - Premise]

[Inference Indicator - Premise - Conclusion]

- (3) Having decided upon the type of inference indicator that is involved, you can then make use of the information to arrive at the relevant conclusion, together with at least one of the premises involved in the inference, since if the inference indicator is of the same type as "therefore", the conclusion will follow the inference indicator, while the premise will precede the inference indicator, and if the inference indicator is instead of the same type as "since", what follows the inference indicator will be a premise, and the conclusion will either precede the inference indicator, or else come after the premise.

- (4) Inferences usually involve two premises. Consequently, there will usually be one more premise that one needs to identify. So scan the text in the vicinity of the inference indicator to see if there is another statement that it appears the author is using, in conjunction with the premise already identified, to generate the conclusion in question.

- (5) If no other premise appears to be part of the text, is there an implicit premise that it is plausible to ascribe to the author? Here you can often use the

mechanical method of arriving at possible implicit premises, which is set out below.

(6) Once you have arrived at the premises and the conclusion for the sub-arguments associated with all of the inference indicators, try to link the sub-arguments together in such a way that every conclusion of a sub-argument - with the exception of the grand conclusion that the argument as a whole is supposed to establish - is a premise in another sub-argument.

(7) Your final goal should be a fully explicit, and logically organized argument. Such an argument will have the following features:

- (1) It will be a series of statements, and will include all of the premises, both stated and unstated, plus the final conclusion, plus any intermediate conclusions that were used in getting from the premises to final conclusion.
- (2) It is probably best to place a number in front of each statement, so that it is easy to refer to that statement later on, both within the argument itself, and when one is discussing the argument.
- (3) If a statement is a premise, it should be indicated that this is so.
- (4) If a statement is not a premise, it must be inferred from one or more earlier statements in the argument, and one should indicate which statements are supposed to entail it. This can be done either by giving the numbers of the statements from which it is supposed to follow, or, as we shall be doing later on, by means of a diagram.
- (5) The final statement in the argument will be the grand conclusion.

2. The Idea of Implicit Premises

Let us now look at some of these steps in more detail, starting first with the idea of implicit premises.

The basic point here is that it is often the case that people, in setting out an argument, do not bother to state explicitly all of the premises or assumptions that play an essential role in the argument. Assumptions that are thought by the person in question to be widely shared, and uncontroversial, are likely not to be mentioned. The same is generally true with respect to premises that seem obvious, given the argument as a whole, or the context in which it is being advanced.

As an illustration, consider the following argument, which was used in an earlier discussion of the idea of inference indicators:

"I have just polished off two six-packs; I am feeling very nauseous; I am unable to get up off the floor, and the rest of the world is spinning around

me at something approaching the speed of light. Therefore I am probably slightly drunk."

When I say that I have just polished off two six-packs, that I am feeling very nauseous, and so on, and then conclude that I am probably somewhat drunk, it is natural to conclude that the six-packs in question contained beer, rather than, say, mineral water. I did not, of course, explicitly say, at any point, that they contained beer rather than mineral water. None the less, it is reasonable for you to view the claim that they contained beer as one of my unstated premises, since given the context of the argument as a whole, it is easy to see why I should think that it was not something that needed to be explicitly mentioned. If, of course, I am right in front of you, in a lively state, you need merely ask me whether the proposition that the six-packs contained beer was one of the unstated premises of my argument. But if I am no longer around, or have passed out, or you are simply reading the argument when I am not present, there will be no alternative but to interpret the argument, charitably, as involving the unstated premise that the six-packs did contain beer.

3. An Illustration of the Expansion of a Condensed Argument

Let me now illustrate some of the above steps by considering a very simple argument. Suppose that someone says that it is wrong for people to have blood transfusions, and when asked why it is wrong, responds as follows:

"It is wrong to have blood transfusions because the Bible says that God has forbidden us to have blood transfusions."

The first step involves a preliminary identification of the logical structure of the argument. Given the brevity of the argument, and the presence of the inference-indicator term, "because", this is relatively straightforward. What precedes the term "because" - namely, the claim that it is wrong to have blood transfusions - must be the conclusion, while what follows - namely, that the Bible says that God has forbidden us to have blood transfusions - must be the premise. So we now have the following argument

(1) The Bible says that God has forbidden us to have blood transfusions.

Therefore: It is wrong to have blood transfusions.

This argument is surely incomplete. So let us move on to the next step, and ask whether there are any assumptions, which the person had in mind, but neglected to state explicitly in the above formulation of the argument. It seems very likely indeed that there are, since it seems likely that if we were to ask a person who had put forward the above argument what connection there is between his claim that the Bible says that God has forbidden us to have blood transfusions, and his claim that it is wrong to have blood transfusions - that is to say, why he thinks that the former provides a reason for accepting the latter - one

things that he or she would be likely to say is that if the Bible says that God has forbidden us to have blood transfusions, then God has forbidden us to have blood transfusions, since everything the Bible says is true. Given this response, then, the argument could be expanded as follows:

- (1) The Bible says that God has forbidden us to have blood transfusions.
(An explicit premise).
- (2) Everything the Bible says is true. (Implicit premise).
- (3) God has forbidden us to have blood transfusions.
(An intermediate conclusion, inferred from statements (1) and (2).)

Therefore: It is wrong to have blood transfusions.

This expansion certainly makes the structure of the person's argument clearer. Yet there is still a gap: How is the conclusion that it is wrong to have blood transfusions supposed to follow from the claim advanced at (3), viz., the claim that God has forbidden us to have blood transfusions? But, again, there is a natural answer that we might expect the person to offer, namely, that if God has forbidden us to have blood transfusions, then it is wrong for us to have blood transfusions, since whatever God forbids is necessarily wrong. Incorporating this additional premise into the argument then leads to the following expanded statement:

- (1) The Bible says that God has forbidden us to have blood transfusions.
(An explicit premise).
- (2) Everything the Bible says is true. (Implicit premise).
- (3) God has forbidden us to have blood transfusions.
(An intermediate conclusion, inferred from statements (1) and (2).)
- (4) Whatever God forbids us to do is wrong. (An implicit premise)
- (5) It is wrong for us to have blood transfusions. (The final conclusion, inferred from statements (3) and (4).)

The strategy, to sum up, is this. We look for inference-indicators in order to locate some premises and at least the basic conclusion. We then ask whether the conclusion follows from the premise (or premises) that we have - that is, whether the argument is valid as it stands. If it is not, we then need to consider whether the person has in mind some additional claims, some additional premises, that he or she did not explicitly mention, and we try to find assumptions that the person in question would be likely to believe to be true, and which when added to the argument will give one a valid argument.

In the present case, given the religious nature of the argument, and the appeal to the Bible, it seemed very likely that a person who advanced that above argument might well be relying upon the following two, unstated assumptions:

- (i) Everything the Bible says is true.
- (ii) Whatever God forbids us to do is wrong.

Moreover, when those two assumptions were added to the argument, we were able to set out an argument which did not involve any gaps, and which was logically valid.

This, of course, does not mean that the argument in question is a good one. Before one could draw that conclusion, one would need to consider whether the premises are true, or at least plausible.

4. The Idea of Linking Together Sub-Arguments

Consider the following, very plausible argument:

"All left-wingers are aliens! How do I know? Well left-wingers must all come from Venus, given that they're women. But you wonder whether left-wingers are all women? Well they must be, mustn't they? After all, left-wingers are soft-hearted and caring people."

In expanding this into a fully explicit argument, the first step is to identify the inference indicators. Here, we have some rather long phrases serving as inference indicators, indicating by the underlining:

"All left-wingers are aliens! How do I know? Well left-wingers must all come from Venus, given that they're women. But you wonder whether left-wingers are all women? Well they must be, mustn't they? After all, left-wingers are soft-hearted and caring people."

Next, one asks about the type of each inference indicator, and here it appears that each is of the same type as "since" - that is, they are of the following sort:

[Conclusion - Inference Indicator - Premise]

By making use of this information, and selecting material after the inference indicator as the premise, and appropriate material preceding it as the conclusion, one arrives at the following partial statements of the three sub-arguments:

Sub-Argument 1

All left-wingers come from Venus	[Explicit premise]
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Therefore: All left-wingers are aliens	[Grand conclusion]
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Sub-Argument 2

All left-wingers are women [Explicit premise]

Therefore: All left-wingers come from Venus [Intermediate conclusion]

Sub-Argument 3

All left-wingers are softhearted and caring people [Explicit premise]

Therefore: All left-wingers are women [Intermediate conclusion]

In the case of each sub-argument, a premise is missing. The next step, then, is to find, in each case, a second premise that, together with the first premise, might plausibly be viewed as generating the relevant conclusion. Here the most plausible candidates, I think, are as indicated below:

Sub-Argument 1

(1) All left-wingers come from Venus [Explicit premise]

(2) All things that come from Venus are aliens [Implicit premise]

Therefore: (3) All left-wingers are aliens [Grand conclusion]

Sub-Argument 2

(4) All left-wingers are women [Explicit premise]

(5) All women come from Venus [Implicit premise]

Therefore: (6) All left-wingers come from Venus [Intermediate conclusion]

Sub-Argument 3

(7) All left-wingers are soft-hearted and caring people [Explicit premise]

(8) All softhearted and caring people are women [Implicit premise]

Therefore: (9) All left-wingers are women [Intermediate conclusion]

In the next section, I shall set out a mechanical method of locating missing premises. First, however, I want to introduce the idea of linking together sub-arguments so that the argument as a whole is set out in a logical fashion.

To do this, notice that each of the two intermediate conclusions occurs as a premise in one of the other two arguments. Thus the intermediate conclusion that is statement (6) is identical with statement (1), which is a premise in the first sub-argument. Similarly, the intermediate conclusion that is statement (9) is identical with statement (4), which is a premise in the second sub-argument.

It is possible, because of this, to arrange the above arguments in a series where every step is either a premise, or something that follows from earlier steps. When this is done, the argument as a whole will contain seven statements, since, as we have seen, of the nine statements in the above three sub-arguments, two occur twice.

Here is the rearranged argument, with the statements renumbered:

- (1) All left-wingers are soft-hearted and caring people [Explicit premise]
- (2) All softhearted and caring people are women [Implicit premise]
- Therefore:
- (3) All left-wingers are women [From (1) and (2)]
- (4) All women come from Venus [Implicit premise]
- Therefore:
- (5) All left-wingers come from Venus [From (3) and (4)]
- (6) All things that come from Venus are aliens [Implicit premise]
- Therefore:
- (7) All left-wingers are aliens [From (5) and (6)]

5. A Mechanical Method for Arriving at Implicit Premises

5.1 The Underlying Idea

Consider the first inference in the above argument:

- (1) All left-wingers are softhearted and caring people
- (2) All softhearted and caring people are women
- Therefore:
- (3) All left-wingers are women

This argument has a certain logical form, or structure. To see what that structure is, replace the following expressions - "left-wingers", "soft-hearted and caring people", and "women" by "As", "Bs", and "Cs" respectively. This gives us:

(1) All As are Bs

(2) All Bs are Cs

Therefore:

(3) All As are Cs

Thus formulated, one can see that the argument has the following features:

- (1) Both of the premises, and the conclusion, begin with the word "all".
- (2) No general term occurs in the conclusion unless it occurs in one (but not both) of the premises. Thus the general term "As" occurs in the conclusion and in premise (1), while the general term "Cs" occurs in the conclusion and in premise (2).
- (3) One general term - namely, "Bs" does not occur in the conclusion, but it does occur in both premises.
- (4) Moreover, that term occurs in a different position in the two premises. In the first premise, "Bs" is in the consequent of the "all" statement, whereas in the second premise it is in the antecedent.

At this point, it is very helpful to have a label for a term that functions in the way that "Bs" does in the above argument schema. The label traditionally used here is "middle term". A middle term can, then, be defined as follows:

A middle term is a term that has the following properties:

- (1) It occurs in both premises;
- (2) It does not occur in the conclusion;
- (3) In arguments that involve three "all" statements, the term in question occurs in a different position in the two premises - namely, in the antecedent of one, and in the consequent of the other.

5.2 The Single Syllogism Case

The above provides one with a mechanical method of arriving at missing premises in arguments of the relevant sort - that is, that involve three "all" statements. (Similar methods can be used for arguments with a different logical form.) For suppose that one is confronted with an argument with a missing premise, such as:

(1) All As are Bs

(2) ??

Therefore:

(3) All As are Cs

Looking at this argument, one can see that it contains a general term - namely "Bs" - that does not occur in the conclusion. That term, accordingly, must be the middle term, and so it must occur in both premises. In addition, since one is presumably dealing with an argument that involves three "all" statements, one knows that the middle term must occur in a different position in the two premises. So this allows us to partially fill in the missing second premise:

(1) All As are Bs

(2) All Bs are ??

Therefore:

(3) All As are Cs

Next, one knows that in arguments of the sort we are considering - and which are referred to as syllogistic arguments - any general terms that occur in the conclusion must occur in one of the premises. (This is not true of other types of arguments.) This means that since the term "Cs" occurs in the conclusion, it must also occur in one of the premises. There is, however, only one place that is still blank. Putting the term "Cs" in that location then gives us the following argument, in which the missing second premise has been completely identified:

(1) All As are Bs

(2) All Bs are Cs

Therefore:

(3) All As are Cs

Finally, suppose, instead, that it was the premise at (1) that was missing, so that all that we had was:

(1) ??

(2) All Bs are Cs

Therefore:

(3) All As are Cs

Looking at this argument, one can see that it, too, contains a general term - namely "Bs" - that does not occur in the conclusion. That term, accordingly, must be the middle term, and so it must occur in both premises. Moreover, since one is presumably dealing with an argument that involves three "all" statements, one knows that the middle term must occur in a different position in the two premises. So this allows us to partially fill in the missing second premise:

- (1) All ?? are Bs
- (2) All Bs are Cs
- Therefore:
- (3) All As are Cs

Next, one knows that in syllogistic arguments that any general terms that occur in the conclusion just occur in one of the premises. (This is not true of other types of arguments.) This means that since the term "As" occurs in the conclusion, it must also occur in one of the premises. There is, however, only one place that is still blank. Putting the term "As" in that location then gives us the following argument, in which the missing premise has once again been completely identified:

- (1) All As are Bs
- (2) All Bs are Cs
- Therefore:
- (3) All As are Cs

5.3 The Double Syllogism Case

This method can also be extended to some cases where two successive syllogistic inferences have been collapsed into one premise and a conclusion. Thus, consider the following argument schema, involving two linked syllogistic inferences:

- (1) All As are Bs
- (2) All Bs are Cs
- Therefore: (3) All As are Cs
- (4) All Cs are Ds
- Therefore: (5) All As are Ds

Now consider all of the ways in which two of the three premises, together with the intermediate conclusion - that is, (3) - might be omitted:

- A. (1) All As are Bs
- Therefore: (5) All As are Ds

- B. (4) All Cs are Ds
- Therefore: (5) All As are Ds

- C. (2) All Bs are Cs
Therefore: (5) All As are Ds

In cases A and B, there is no mechanical method of reconstructing the whole argument. For cases A and B look just like "one syllogism" inference cases, and when one applies the preceding method to those cases, what one arrives at are, respectively:

- A*. (1) All As are Bs
(*) All Bs are Ds
Therefore: (5) All As are Ds

- B*. (**) All As are Cs
(4) All Cs are Ds
Therefore: (5) All As are Ds

Rather than recovering the original argument, one recovers an argument that, in the case of A*, contains a statement - namely, (*) - that, although it follows from statements in the original argument A, is not one of those statements, while, in the case of B*, there is a statement - namely, (**) - which is part of the original argument B, but which occurs there as an intermediate conclusion, rather than as a premise, as it does in the reconstructed argument B*

Case C is more interesting, since the method set out above for the one syllogism inference case cannot be applied to C. The reason is that the two general terms that occur in the premise - that is, statement (2) - are different from the two general terms that occur in the conclusion - statement (5). In the case of the former, the general terms are "Bs" and "Cs", whereas in the case of the latter statement they are "As" and "Ds".

In a single syllogism, we saw that one general term that occurs in two premises is not present in the conclusion. In argument C, we have two terms that occur in the one premise, and that are missing from the conclusion. So those two terms must be middle terms in different syllogistic inferences, and this conclusion enables us to reconstruct the argument as follows.

First, given that "Bs" in statement (2) is a middle term, we need another premise containing the term "Bs". Moreover, since one is presumably dealing with an argument that involves only "all" statements, one knows that the middle term, "Bs", must occur in a different position in the two premises. So this allows us to partially fill in one of the missing premises, giving us an argument that looks like this:

- (1) All ?? are Bs
(2) All Bs are Cs

Therefore: (5) All As are Ds

Next, one knows that in syllogistic arguments any general terms that occur in the conclusion must occur in one of the premises. But we also know that in arguments of this sort, any term that occurs in the conclusion must occur in the same location in one of the premises. This means that the missing general term in the antecedent of statement (1) must be the term "As", rather than the term "Cs", since the term "As" occurs in the antecedent of the conclusion. This enables us to complete the identification of statement (1), giving us the following argument:

(1) All As are Bs

(2) All Bs are Cs

Therefore: (5) All As are Ds

Now, however, we have two premises, and one can ask what follows syllogistically from those two premises. The answer is that the following statement

(3) All As are Cs

follows from (1) and (2). So we can expand our reconstructed argument to that it becomes:

(1) All As are Bs

(2) All Bs are Cs

Therefore: (3) All As are Cs

Therefore: (5) All As are Ds

Now, however, the only gap in the argument occurs between statement (3) - the intermediate conclusion - and statement (5) - the final conclusion. Thus we are back to the earlier problem of finding a single missing premise, and looking at statements (3) and (5) we can see that the middle term must be "Cs", while the other general term in the missing premise must be the term in the conclusion that is not contained in statement (3) - namely, "Ds". Moreover, that term must occur in the same location in the missing premise as it does in the conclusion - namely, in the consequent position. Thus we have arrived at the full argument:

(1) All As are Bs

(2) All Bs are Cs

Therefore: (3) All As are Cs

(4) All Cs are Ds

Therefore: (5) All As are Ds

Here's an illustration of this type of reconstruction - albeit one that involves an additional complication. Suppose that someone claims that abortion is always very seriously wrong, and when asked why this is so, replies that all humans have a serious right to life. What one is being offered, then, is the following condensed argument

All humans have a serious right to life

Therefore: Abortion is always very seriously wrong.

If we try to apply the above mechanical method to this argument, we will find that we run into problems. The reason is that while the conclusion talks about actions - abortions - the premise talks instead about individual - humans - and the mechanical method cannot, so to speak, generate an appropriate mesh given that difference. But if one recasts the premise so that it also refers to actions, things will fall into place. How, then, could the premise be recast? One natural way is as follows:

Acts of killing humans violate a serious right to life.

Let us start out, then from the following condensed argument:

Acts of killing humans violate a serious right to life.

Therefore: Abortion is always very seriously wrong.

If now we proceed as in the schematic example, we will identify "acts of killing humans" as a middle term, and this will lead to the following first step in the reconstruction:

All ?? are acts of killing humans

Acts of killing humans violate a serious right to life.

Therefore: Abortion is always very seriously wrong.

The missing general term in the first statement must then be a general term that occurs in the conclusion, and the one that occurs in the proper place - namely, the antecedent. Inserting the term "abortions" in the relevant place will then give us:

All abortions are acts of killing humans

Acts of killing humans violate a serious right to life.

Therefore: Abortion is always very seriously wrong.

Next, we can insert the conclusion that follows syllogistically from the first two statements, namely, "All abortions violate a serious right to life". This gives us:

All abortions are acts of killing humans

Acts of killing humans violate a serious right to life.

Therefore: All abortions violate a serious right to life.

Therefore: Abortion is always very seriously wrong..

Finally, we have only to fill in the gap between the intermediate conclusion and the final conclusion, using the familiar method for the case where there is a single missing premise. The result will be the following, fully reconstructed argument:

All abortions are acts of killing humans

Acts of killing humans violate a serious right to life.

Therefore: All abortions violate a serious right to life.

All violations of a serious right to life are very seriously wrong

Therefore: Abortion is always very seriously wrong.

The situation that we have been considering here - where someone leaves out both two premises and an intermediate conclusion - is relatively rare. But the fact that it is possible by means of a purely mechanical technique to reconstruct such an argument starting from only a single premise and the final conclusion testifies to the power of this method of locating missing statements in an argument, and to the importance of what underlies it - namely, the idea of logical form.