Go Higher Module 5- Assumptions

Let's start with an anecdote to demonstrate the meaning of an assumption. A boy was with his mother in a car that met with an accident. The mother died instantly and the boy was brought to a hospital in a critical state. The doctor called for the nurse and instructed that the glass be removed from the boy's body. The nurse was stunned to see the boy and said, "I cannot do it, Dr. My hands will tremble as he is my son."

Did that give you a jolt? Does the anecdote sound impossible? It's not! The nurse could be the boy's father or other mother. How often do we fall prey to such mistakes, when what we know to be generally true interferes with our reasoning? You assumed that all nurses are women, and that the boy has only one mother. This is why you got shocked.

An assumption is something that has not been stated in the argument, but must be true for the conclusion to hold true. Assumptions are unstated reasons/ pieces of evidence. They are implicit in an argument.

Parts of an Argument:

a. Visible - the conclusion and the evidence.
b. Invisible - the assumptions used in reaching the conclusion.

Identification of Assumptions
For finding the assumption, we see where the shift is between the evidence and the conclusion. We look for any details that have changed when drawing the conclusion from the evidence. Let us understand the process of finding assumptions with an example.

Argument- All mosquitoes are pests because all mosquitoes are insects.

Find the assumption from the following options:

A. All insects are creepy.
B. Some venomous animals are rare.
C. Some insects are pests.
D. All insects are pests.

Step 1. Read the argument slowly and carefully. Put it into your own words to make it clear. Understand every aspect of it. Interpret it in your own words by using the phrase "what they're saying is. . . because. . .".

Step2. Separate the evidence from the conclusion:

Evidence: All mosquitoes are insects.
Conclusion: All mosquitoes are pests.

Step 3: Identify the main elements in the evidence and conclusion. The evidence was about mosquitoes and insects, whereas the conclusion talks about mosquitoes and pests. Hence, the

assumption will be about insects and pests. That will cover the logical jump in the argument. Eliminate options A. and B. as they contain elements foreign to the argument.

Step 4: Substitute options C. and D., which are about the variables ‘insects’ and ‘pests’, between the evidence and conclusion. This is to check if they fill the logical jump in between.

Evidence: All mosquitoes are insects.
Option C: Some insects are pests.
Conclusion: All mosquitoes are pests.

The evidence and the assumption here do not add up to make the conclusion necessarily true because ‘some insects are pests’ does not mean that ‘all insects are pests’. It may be the case that some, not all, insects are not pests. From this, we can logically say that some mosquitoes are also not pests. This is different to the scenario presented by the conclusion. This means the conclusion in the argument would fail- it would not be true.

Now, for option D.

Evidence: All mosquitoes are insects.
Option D: All insects are pests.
Conclusion: All mosquitoes are pests.

Here, the evidence and assumption add up to make the conclusion necessarily true.

Step 5: Negate option D. Reverse ‘All insects are pests’ to its polar opposite - ‘No insects are pests’. Insert this negated assumption in the argument to check that the argument will necessarily fail.

Evidence: All mosquitoes are insects.
Negated Option D: No insects are pests.
Conclusion: All mosquitoes are pests.

The negation of option D makes the argument fail. It cannot be true under any circumstance.

Thus we have confirmed option D to be the assumption.

So, we have seen that the steps in finding assumptions are:

1. Read the argument slowly and carefully. Make sure you understand every aspect of it.
2. Rephrase the argument in your own words for clarity.
3. Separate the evidence from the conclusion.
4. Recognise the main variables in the argument. These are the elements or characteristics that the argument is about. See how these variables are connected between their state in the evidence and the conclusion.

Identify the logical jumps that have been made between the evidence and the conclusion. Predict possible assumptions that cover these logical jumps. Eliminate options that concern any parameters foreign to the argument.

5. Substitution Test: Substitute the possible assumptions between the evidence and the conclusion. See if the argument stands true. Check whether the assumptions fill the logical gap between the evidence and the conclusion.

6. Negation Test: Whichever assumptions fulfill step 5, negate them. Insert their polar opposite between the evidence and the conclusion. Now, the conclusion must fail, and must not be a possibility under any scenario. This would confirm the assumption.

Tip: The process of deconstructing arguments becomes simpler by labelling the elements in it. Use letters like X, Y, etc. This helps to identify the relationship between the elements of an argument, and classify the connections as logical possibilities or necessities.

Example 2- When a person is under intense stress, their cardiovascular response is the same as it is during physical exercise. Stress must be as beneficial for the heart as is physical exercise.

Which of the following is an assumption in the above argument?

A. Exercise is an effective means of relieving stress.
B. The body's short-term cardiovascular response to any activity indicates that activity's long-term effect on the body.
C. Cardiovascular response is an adequate measure of how beneficial an activity is for the heart.
D. Stress can have a positive effect on the body.
E. Exercise is the most reliable method of maintaining a healthy heart.

1. Read the argument slowly and carefully. Make sure you understand every aspect of it.
2. Rephrase it in your own words to ensure that you have understood it completely.

The argument is saying that the benefit for the heart from stress would be the same as that from physical exercise, given that intense stress produces the same cardiovascular response in a person as physical exercise.

3. Separate the evidence from the conclusion.

Evidence- Intense stress produces the same cardiovascular response in a person as physical exercise does.

Conclusion- The benefit for the heart from stress is the same as that from physical exercise.

4. Recognise the main variables in the argument. Identify the logical jumps between the evidence and the conclusion. Predict possible assumptions accordingly. Eliminate options that concern any foreign variables.

The variables in the evidence are the cardiovascular response from intense stress and from physical exercise. The variables in the conclusion are the benefit for the heart from stress and from exercise.

An assumption would link the cardiovascular response from an activity being a sign of the benefit for the heart from it. Another possible assumption is the cardiovascular response during an activity can be used to determine whether the activity is beneficial for the heart.

Option A talks about an effective means to relieve stress. Option B brings in the time variable and draws a link between the short-term and long-term effects of a cardiovascular response on the body. Option E states 'a reliable method of maintaining a healthy heart' as a variable. All these options concern variables that are foreign to the argument and can be eliminated.

Option D restates the conclusion so it can be eliminated.

5. Substitution Test: Substitute possible assumptions between the evidence and the conclusion to see if the argument stands true. Check if the assumptions fill the logical gap between the evidence and the conclusion.

Evidence- Intense stress produces the same cardiovascular response in a person as physical exercise.

Option C- Cardiovascular response is an adequate measure of how beneficial an activity is for the heart.

Conclusion- The benefit for the heart from stress is the same as that from physical exercise.

Option C fills the gap in the argument.

6. Negation Test: Whichever assumptions fulfill step 5, negate them. Insert their polar opposite between the evidence and the conclusion. The conclusion must fail necessarily, and not be a logical possibility under any scenario. This would confirm the assumption.

Evidence- Intense stress produces the same cardiovascular response in a person as physical exercise.

Negated Option C- Cardiovascular response is not an adequate measure of how beneficial an activity is for the heart.

Conclusion- The benefit for the heart from stress is the same as that from physical exercise.

The negated version of Option C means that we cannot measure the cardiovascular benefit of an activity based on only cardiovascular response. There can be other effects on the body from an activity which need to be accounted for when evaluating the benefit derived from that activity for the heart. The conclusion of the argument cannot be true under all circumstances if we consider the negated version of Option C as an assumption. Hence, Option C is confirmed.

Characteristics of Assumptions

Assumptions have the following characteristics:

1. Assumptions can never be facts that counter the argument (any piece of evidence, or the conclusion).

2. Assumptions cannot contain any extraneous, foreign variables.

3. There can be multiple assumptions in an argument. These may link the evidence to the conclusion, or any two pieces of evidence to each other.

4. Assumptions do not restate the argument.