Symbolic Logic Assignment

A Report on Fallacies

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Introduction

In this report, we shall be discussing 3 fallacies and how they are fallacious, namely the non sequitur, the post hoc ergo propter hoc, and the hasty generalization fallacies.

Fallacy #1: Non Sequitur [Latin for "it does not follow"]

Non Sequitur is a logical fallacy where the conclusion does not logically relate to the premises. It occurs in three variations:

- **Pure Fallacies**, which occur when the logical connection between the subject and predicate is flawed. They are a result of incorrect logical deduction, and hold no validity.

  Consider the following example: "The MMA champions are men, therefore, the MMA champions cannot push a rock." There is no premise statement which states that being a man makes one unable to push rocks. An illicit assumption has been made here.

- **Fallacies of Ambiguity**, which are misinterpretations of statements, meaning the logic is built on the incorrect assumptions of the premises. It may also be the case that the premises have incorrect phrasing or the logician has a misunderstanding about one or more premises.

  For example, "John Lennon is a member of the Beatles. All beetles have 6 legs. Therefore, John Lennon has 6 legs."

  In this instance, the "Beatles" are a rock band, and very much human. This fallacy is committed due to the fact that "Beatles" and "Beetles" are homophones.

- **Fallacies of Irrelevance**, which are characterized by a complete logical disconnect between the premises and the conclusion.

  "It is raining outside, therefore, it is 4 pm" is an example of the fallacy of irrelevance. The only fact that it is raining outside doesn't give any information about the time. These arguments sometimes have a pinch of hilarity in them.

Fallacy #2: Hasty Generalization [true in my experience and therefore, true for *all*]

Sometimes, a set of inductive arguments are made on the basis of personal bias or skewed results. Such arguments exhibit a fallacy called Hasty Generalization, more commonly known as Overgeneralization.

People make the fallacy when they base conclusions on an entire organization/community, when their premise for the argument describes mainly a very small and often non-representative sample of the population of the community. These can be quite a problem since it's hard to tell if there's enough evidence for the claim in these cases.

For example, let us assume a post apocalyptic survey is published, that says,"*The race of a major part of the zombie horde is X*". This leads some non-X people to believe,"*If I encounter a person of X race, he is surely a zombie*".

Another one could be "Samsung products are the most expensive products", which is not the case, there's bound to be some industry level, or luxury brand that sells way more expensive products than apple.

You see this problem even in less general sectors, not just in daily life. For example, in a JEE paper, if a question gives a pattern that holds for N = 1,2,3, students may tend to believe it holds for all N.

Fallacy #3: Post hoc, ergo propter hoc [*after* this, therefore, *because of* this]

Post hoc, ergo propter hoc, a.k.a the *Post Hoc* Fallacy, is a fallacy where the conclusion is incorrectly assumed to be the consequence of a premise, even in the absence or lack of logical connection between the two.

This is a big problem in the field of research/academia as mistaken hypotheses formed in this way can waste a lot of time and resources.

THIS ONE'S A BIT HARDER TO VISUALIZE, SO HERE'S A FEW EXAMPLES:

- Our football team was doing really bad until I bought new shoes, therefore, the shoes made us win the game
- The inmate ate a tomato dish before he was strapped into the electric chair and died. Therefore, the tomato, (and not electrocution) is what killed him.

THINGS TO NOTE FOR THIS FALLACY:

This is not to be confused with Correlation = Causation (*cum hoc ergo propter hoc*, Latin for 'with this therefore because of this'), which means just because two events occur simultaneously, does not mean one causes the other.

The Post hoc fallacy is committed whenever two events needn't necessarily be related. But this doesn't mean that they are not related for all cases! There might be further investigation required if a pair of events keep occurring one after the other, seemingly by coincidence.

Conclusion

In this report we have explained about the fallacies and the examples. Please however note that the cases we have observed for the above fallacies are to be taken with a grain of salt in real life. New evidence may construct premises that overturn a previous argument as well, so stay open minded.

References:

- The Rational Wiki:
  - https://rationalwiki.org/wiki/Post_hoc,_ergo_propter_hoc
  - https://rationalwiki.org/wiki/Overgeneralization
- Logically Fallacious:
  - https://www.logicallyfallacious.com/logicalfallacies/Hasty-Generalization
- Barker, Stephen F. [1974]. "Chapter 5: Fallacies". The Elements of Logic, p. 192-200

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