Modus inversus – if (premise is false) then (conclusion is false)

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Abstract

Objective: When theorems or theories are falsified by a formal prove or by observations et cetera, authors respond many times by different and sometimes inappropriate counter-measures. Even if the pressure by which we are forced to believe in different theories although there are already predictively superior rivals to turn to may be very high, a clear scientific methodology should be able to help us to assure the demarcation between science and pseudoscience.

Methods: Karl Popper's (1902-1994) falsificationist methodology is one of the many approaches to the problem of the demarcation between scientific and non-scientific theories but relies as such too much only on *modus tollens* and is in fact purely one-eyed.

Results: Modus inversus is illustrated in more detail in order to identify non-scientific claims as soon as possible and to help authors not to hide to long behind a lot of self-contradictory and sometimes highly abstract, even mathematical stuff.

Conclusions: Modus inversus prevents us from accepting seemingly contradictory theorems or rules in science.

Keywords: ***Science, non-science, modus inversus.***

1. Introduction

In view of the many and sometimes each other excluding competing scientific theories of the nature and of our world, a theoretical appreciation of scientific proof methods becomes pressing. Generally accepted scientific proof methods thereby constitutes our grounds of scientific evidence which itself might help us to refute or to confirm scientific theories. For these reasons and others, scientific proof methods are equally necessary for scientific knowledge and the demarcation line between (justified personal) belief and exceedingly clear and well-verified scientific knowledge and at the end between ideology and science. For these reasons and others, it is appropriate to explore the nature of **modus inversus** (Barukčić, 2019b) once again.

2. Material and methods

Today's science has become to a very great extent ideological. Rightly or wrongly, science is and has been misused since ever to support the ideologies of its practitioners or of certain ideologies as such and vice versa. Ideologies are meanwhile an unjustified part of the nature of scientific inquiry. Science is not hermetically sealed off from today's dominant, very aggressive, inhuman and leading ideology "**In making profit we believe**". Even if not all scientist seems equally susceptible to appropriation or ideological influence, there is documented (Bombardier et al., 2000) and increasing evidence that **the one who pays commands** even the result obtained by scientific investigations. In particular, **the dictatorship of profit** is on the way to make science trivial, just one view among many others. In order to solve real-world challenges, science taken more seriously should decrease the influence of non-science on science at a maximum. Scientific proof methods are of use to distinguish between scientific knowledge and false even if popular belief or deceptively bad arguments.

2.1. Material

2.1.1. Example 1

In New York (USA), the person M1 has been accused before the court by the public prosecutor of killing the victim V1 on October 1th, 1800. The witness W1 testifies before the court of being at the criminal site at the relevant time and having seen that and how **M1 did not kill V1**. The witness W2 testifies before the court of being at the criminal site too at the relevant time and having seen that **M1 killed V1**. What is the truth? What does constitute a false statement and how can and must the court or sciences as such deal with false statements? Because of that distortion of the evidence and besides of the presumption of innocence and its corollary, *the in dubio pro reo principle*, the court would have to drew an incorrect inference and punish M1 (according to W2).

2.2. Methods

A number of issues has been addressed to the concept of truth and has been with us for a long time. From the standpoint of a co-moving observer, a path can be a straight line. The same path from the standpoint of a stationary observer (Barukčić, 2019a) can be at the same period of time curved (i. e. not a straight line). To put it another way, is the truth absolute or is the truth relative or both or none? Thus far, what is truth, what does truth itself consists in, what is the nature of truth? A definite answer on this issue is not in sight, a considerable progress has still not been made in solving problems like these. More generally, we are confronted with a world in us and around us which prefers to change continuously. We cannot avoid having to face the changes already underway before theoretical problems like these are solved. In these subjects it is necessary to be inquisitive to be able to achieve new knowledge, at the end to try and fail and try another way. An axiomatic approach to assure a high degree of certainty is thus far of preliminary use and can be considered.

2.2.1. Axioms

Axiom 1. (Lex identitatis)

$$+1 \quad = \quad +1 \tag{1}$$

Axiom 2. (Lex contradictionis)

$$+1 \quad = \quad +0 \tag{2}$$

Axiom 3. (Lex negationis)

$$\frac{+1}{+0} \quad = \quad \neg \tag{3}$$

where ¬ denote negation.

2.2.1. Definitions

Definition 1. (The number + 1)

Let c denote *the speed of light in vacuum* (Drude, 1894; Tombe, 2015; W. E. Weber & Kohlrausch, 1856; W. Weber & Kohlrausch, 1857), let ε_0 denote the electric constant and let μ_0 the magnetic constant. Let *i* denote the imaginary number (Bombelli, 1579). The number +1 is defined as the expression

$$+(c^2 \times \varepsilon_0 \times \mu_0) \equiv \quad +1 + 0 \equiv \quad -i^2 \quad = \quad +1 \tag{4}$$

while "=" denotes the equals sign (Recorde, 1557) or equality sign (Rolle, 1690) used to indicate equality and "-" (Pacioli, 1494; Widmann, 1489) denotes minus signs used to represent the operations of subtraction and the notions of negative as well and "+" denotes the plus (Recorde, 1557) signs used to represent the operations of addition and the notions of positive as well.

Definition 2. (The number + 0)

Let c denote the speed of light in vacuum (Drude, 1894; Tombe, 2015; W. E. Weber & Kohlrausch, 1856; W. Weber & Kohlrausch, 1857), let ε_0 denote the electric constant and let μ_0 the magnetic constant. Let *i* denote the imaginary number (Bombelli, 1579). The number +0 is defined as the expression

$$+(c^2 \times \varepsilon_0 \times \mu_0) - (c^2 \times \varepsilon_0 \times \mu_0) \equiv \quad +1 - 1 \equiv \quad -i^2 + i^2 \quad = \quad +0 \qquad (5)$$

while "=" denotes the equals sign (Recorde, 1557) or equality sign (Rolle, 1690) used to indicate equality and "-" (Pacioli, 1494; Widmann, 1489) denotes minus signs used to represent the operations of subtraction and the notions of negative as well and "+" denotes the plus (Recorde, 1557) signs used to represent the operations of addition and the notions of positive as well.

Remark 1.

One of the reasons in defining the basic numbers +1 and +0 in terms of physical "constants" is to put mathematics back on the right track and finally on nature science determined feet's the way it belongs.

3. Results

THEOREM 1. MODUS PONENS BEFORE THE COURT

Premise 1:

if (W1 has been at the criminal site at the relevant time)

then (W1 could have seen that M1 did not kill V1).

Premise 2:

W1 has been at the criminal site at the relevant time.

Conclusion:

W1 could have seen that M1 did not kill V1.

PROOF.

Other evidence is provided before the court which testifies beyond any reasonable doubt that witness W1 has been at the criminal site at the relevant time. Thus far, premise 2 is true. The court decides finally that W1 could have seen that M1 did not kill V1. **Reasons**. According to modus ponens: *if* (W1 has been at the criminal site at the relevant time) *then* (W1 could have seen that M1 did not kill V1). Premise 2 is true, W1 has been at the criminal site at the relevant time, therefore the conclusion is inescapable: W1 could have seen that M1 did not kill V1. In what follows, the testimony of W1 will be considered.

QUOD ERAT DEMONSTRANDUM.

THEOREM 2. MODUS INVERSUS BEFORE THE COURT

The identification of a false statement of an author, a witness or expert, even if not under oath, in a courtroom or other place where examinations of witnesses or experts or publications take place (for example, parliamentary investigation committees, review-articles et cetera) is necessary and must be possible. Today, the common view in science is that we should not relied upon *modus inversus*, in court either. However, the scientific proof methods must should be able to deal with false statements, whether orally or in writing, too. Otherwise, it would be very problematic or may be impossible to correct erroneous statements or interpretations based on the misapplication of scientific rules or incorrect rules.

Premise 1:

If (W2 has *not* been at the criminal site at the relevant time)

then (W2 *cannot* have seen that M1 killed V1).

Premise 2:

W2 has not been at the criminal site at the relevant time.

Conclusion:

W2 cannot have seen that M1 killed V1.

PROOF.

However, with respect to witness W2, the court possesses irrefutable evidence that witness W2 has been in Paris (France) on October 1th, 1800. The court applies **modus inversus** in the following way. **Premise 1**: *If* (W2 has *not* been at the criminal site at the relevant time) *then* (W2 *cannot* have seen that M1 killed V1). **Premise 2**: W2 has *not* been at the criminal site at the relevant time is secured. On October 1th, 1800 witness 2 has been in Paris (France) and not in New York (USA). The court concludes (**Conclulsio**): W2 cannot have seen that M1 killed V1. In what follows, the testimony of W2 will not be considered.

QUOD ERAT DEMONSTRANDUM.

4. Discussion

Our historically backgrounded scientific possibilities to recognize truth imposes the obligation to apply different scientific methods and must not be artificially restricted. Otherwise, the innocent can be punished while and the guilty could be rewarded. In science, the recognition of fallacious and erroneous theorems and statements would be impossible.

Modus securus, or a direct proof in the positive (+1=+1) or in the negative (+1=+0), which allow us to draw a clear conclusion by combining the axioms, definitions, and earlier theorems cannot be applied under every circumstance. The use of indirect proofs is justified and necessary to.

5. Conclusion

Modus inversus is a very important and reliable proof method.

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