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## Modus inversus is generally valid

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### Abstract

**Objective:** Narrowly speaking, one scientist might claim that the truth as such is determined by human mind and consciousness, by pure subjective and poetic mathematical definitions preferred by an author and as such without any relation to objective reality and independent of the same. In contrast to claims like that, another scientist might want to endorse more Thomas Aquinas balanced formula “**Veritas est adaequatio rei et intellectus**” or truth is the equation of thing and intellect. Thus far, is there a truth valid for all scientist and can and how can the same be established?

**Methods:** Definitions or mathematical and other (logical et cetera) operations are sometimes a necessary scientific step to shorten a long and arduous scientific way or to minimize the efforts of an author justifiably but also contain the danger of misuse and to accommodate (logical) contradictions. The science needs reliable methods to check such products of human mind and pure human imagination for its logical consistency.

**Results:** *Modus inversus* is reviewed again and it should be noted that *modus inversus* among other methods possess the capacity to check definitions, mathematical and other operations or relationships as such for logical consistency very precisely.

**Conclusions:** **Modus inversus is generally valid.**

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

## 1. Introduction

The principles of scientific methodology and inquiry (Barukčić, 2019c) can be a source of justification of wishful thinking, of scientific mysteries and other errors of reasoning in science too upon which whole theories can rest. It is incomprehensible, nay irritating and aggravating in the extreme, when scientific mistakes are created unconsciously and unintentionally i. e. by carelessness, superficiality, lack of methodological skill or other factors not caused by some dark and ulterior (ideological and other) motives of an author himself. However, such errors or the resultant mass infection of science by cherished belief can be detected i.e. by methods like *modus inversus* and cannot be rescued from trouble any longer. In other words, a definition, a theorem or a theory can very well be found to be incorrect if there is a logical error in its deduction. **“Eine Theorie kann also wohl als unrichtig erkannt werden, wenn in ihren Deduktionen ein logischer Fehler ist ...”** (Einstein, 1919, p. 17). Therefore and apart from the permanent and intrinsic duty of every author to detect technical errors or errors in reasoning in his own and the publications other and voluntarily to correct those errors which cannot be tolerated at all as soon as possible, there will always be the need to formulate the theorems or positions claimed by an author in a way and as simple as possible such that other readers can spot and identify possible errors in author’s reasoning or publications quickly. In this respect it may be permitted to highlight again the elaborations of one of the greatest thinkers of all times, the still unbeaten, non-extinguishing and bright shining star which continuously enlightens the darkness in which to many scientists are still lost, Albert Einstein. **“A theory is the more impressive the greater the simplicity of its premises is ...”** (Einstein, 1949, p. 12). In other words, the more unsystematic a publication of an author is, the more unnecessary complicated an author formulates his own position or chain of arguments, the greater the suspicion that the author does not even know what he or she is writing about or that an author is deliberately cooking an ideologically determined and poisonous scientific soup. In point of fact, it is inexcusable if errors in reasoning are created intentionally in order to deceive a single reader or the scientific community as such. The primary motivation of such authors while presenting arguments in their own, unique and many times very complicated way is to trick the reader into agreement but not to provide a long lasting and reliable contribution to scientific progress. One

fundamental part of science is transparency and simplicity. Therefore, “scientific” practices like the one described before are absolutely repugnant, distasteful, outrageous, scandalous and inhuman. The high honor which scientist deserve implies above all the need to continue to meet the expectations with respect to a transparent, methodological and very precise scientific work. Thus far, even if the truth of a theory can never be proven for ever because one never knows if future experience will contradict its conclusions (“**Niemals aber kann die Wahrheit einer Theorie erwiesen werden. Denn niemals weiß man, daß auch in Zukunft eine Erfahrung bekannt werden wird, die Ihren Folgerungen widerspricht ...**” (Einstein, 1919, p. 17)) this does not justify any errors in reasoning which are identified the hard way but easy to overlook while in contrast to that charges and proofs of fallacious reasoning always need time, money, and personal dignity to be accepted by the scientific community. Thus far, any claimed scientific position which is *published anonymously* by an author which is not being exposed to persecution or serious harm by the authorities is opened to suspicion that the same is pleading for a wall of secrecy to conceal sinister intrigues or that the primary goal of such an author is to deceive the community without the possibility to lose his or her own face or reputation publicly or that an author is very insecure about the positions published et cetera. Formally, such publications should be treated by the scientific community as personal opinion or as personal belief but not as serious scientific contribution. In particular, the scientific community or a single scientist as such should consider to retain the right to ignore such publications completely.

## **2. Methods and material**

Systematic experimentation and observation, deductive and inductive reasoning are carried out in detail by using special scientific methods which are the means by which among other scientific knowledge is achieved. Thus far, the certainty of scientific knowledge about the natural world or the nature of scientific inquiry itself depends too on the scientific methods used.

### **2.1. Methods**

Theories appear to progress from lower and simpler to higher and more complex levels. However, the rules valid at the fundamental and most simple level are therefore not invalid at higher levels but not automatically vice versa. One of the most intriguing and controversial

questions may be whether is it allowed at all or does it make any sense to refute or to proof simple and elementary level theories or theorems by high level theories. Any answer given to such a question is itself likely to be controversial. However, high level theories cannot be taken for granted because the same are grounded on a lot of assumptions, definitions and other procedures and may rest upon too much erroneous stuff even if still not identified. Therefore, it should be considered to check at lower and simpler levels like with like. Nonetheless, a justified negation (Barukčić, 2019a) of the *ex contradictione quodlibet principle* (Carnielli & Marcos, 2001) does not imply the correctness of paraconsistent logic as such as advocated by the Peruvian philosopher Francisco Miró Quesada and other (da Costa, 1958; Quesada, 1977).

### 2.1.1. Modus inversus

Let  ${}_R P_t$  denote a *premise* from the standpoint of a stationary observer R, a Bernoulli distributed random variable at a certain period of time or *Bernoulli trial* (Uspensky, 1937, p. 45)  $t$ . The premise can take only the values  ${}_R P_t = \{+0; +1\}$ . Let  ${}_R C_t$  denote a *conclusion* from the standpoint of a stationary observer R, a Bernoulli distributed random variable at the same period of time or Bernoulli trial  $t$ . The conclusion  ${}_R C_t$  can take only the values  ${}_R C_t = \{+0; +1\}$ . Under conditions of classical logic, +0 may denote *false* while +1 may denote *true*. The **modus inversus** is defined as *if*(premise is false) *then* (conclusion is false). The following table (**Table 1**) may illustrate *modus inversus* (Barukčić, 2019c, pp. 181–182) in more detail.

**Table 1. Modus inversus**

		Conclusion		
		${}_R C_t$		
		+0=false	+1=true	
Premise ${}_R P_t$	+0=false	+1	+0	
	+1=true	+1	+1	
				1

Formally, modus inversus can be expressed too as

$${}_R P_t \cup \neg {}_R C_t = 1 \quad (1)$$

where  $\cup$  denotes disjunction or inclusive or. As can be seen, it is not possible to achieve a true conclusion while starting with a false premise.

### 2.1.1. Axioms

Following Einstein himself, the truly great advances in our knowledge of nature originated in a manner almost diametrically opposed to induction. **“Die wahrhaft großen Fortschritte der Naturerkenntnis sind auf einem der Induktion fast diametral entgegengesetzten Wege entstanden.”** (Einstein, 1919, p. 17). In general, Einstein suggest that basic law (axioms) and conclusions together form what is called a ‘theory’. **“Grundgesetz (Axiome) und Folgerungen zusammen bilden das was man eine ‘Theorie’ nennt.”** (Einstein, 1919, p. 17). *Lex identitatis* i.e. **“Chaque chose est ce qu’elle est. Et dans autant d’exemples qu’on voudra A est A, B est B”** (Leibniz, 1765, p. 327), *lex contradictionis* (Boole, 1854; Hessen, 1928; Korch, 1965) and *lex negationis* (Hegel, 1812; Hegel, Di Giovanni, & Hegel, 2010; Newstadt, 2015) may denote the most simple, the most general and the most far reaching axioms of science, the foundation of our today’s and of our future scientific inquiry.

*Axiom 1. (Lex identitatis)*

$$+1 = +1 \quad (2)$$

*Axiom 2. (Lex contradictionis)*

$$+0 = +1 \quad (3)$$

*Axiom 3. (Lex negationis)*

$$\frac{+1}{+0} = \neg \quad (4)$$

where  $\neg$  may denote the (logical) **negation** (Barukčić, 2019b; Boole, 1854). In other words, it should be considered that  $(+1) = \neg \times (+0)$  as known from classical logic.

## 2.1.2. 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  $\varepsilon_0$  denote the electric constant and let  $\mu_0$  the magnetic constant. Let  $i$  denote the imaginary number (Bombelli, 1579). The number +1 is defined as the expression

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

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.

### *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  $\varepsilon_0$  denote the electric constant and let  $\mu_0$  the magnetic constant. Let  $i$  denote the imaginary number (Bombelli, 1579). The number +0 is defined as the expression

$$+(c^2 \times \varepsilon_0 \times \mu_0) - (c^2 \times \varepsilon_0 \times \mu_0) \equiv +1 - 1 \equiv -i^2 + i^2 = +0 \quad (6)$$

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.**

The basic numbers +1 and +0 are defined in terms of physical “constants”. Such an approach opens the strategic possibility to test **classical logic or mathematical theorems** et cetera by reproduceable physical experiments.

## 2.2. Material

### 2.2.1. Example. *If (sex did occur) is false then (being a father of a child) is false.*

A husband somewhere on our earth talks to his wife on November 24<sup>th</sup>, 1800. Darling, today, you gave birth to a child. Thanks God you are both well. However, this is a bit strange for me. As you know, we had no sex with each other for more than 15 years because of my temporary health problems, sex did occur is false. The woman is irritated and answering. Sweetheart, I just don't understand neither what you mean nor your logic. It is of course absolutely for sure that you are the father of this child.

### 2.2.2. Example. *If (gaseous oxygen is present) is false then (a certain human being is alive) is false.*

A 2 meters tall magician who is alive, a folk healer with his heart and his soul a committed advocate and staunch defender of bizarre forms of quantum mechanics somewhere in the U.S. claims that the power of human will and pure human imagination is stronger than any natural law, the laws of classical logic or the laws of relativity theory. To convince the public and the stubbornly unbelieving scientists of supernatural powers, of "spuckhafte Fernwirkung" once and for all he proposes and conducts the following experiment publicly.

A 3x3x3 meters transparent pool is located on stage for everyone to see and is filled with healthy, normal water right up to the edge. Once and for all, it is really ensured that *no gaseous oxygen* is contained in this water. In the following, the magician claims, I will bind myself visible for all to a 200 kg heavy iron ball and climb together with the same and without any further aids and without the possibility to escape from the transparent pool, into the transparent swimming pool. Only with the power of my will and the non-local connection with the gaseous oxygen outside the swimming pool but without any further aids, I will linger in this water which is free of gaseous oxygen at the bottom of the pool for as long as desired, but at least for 8 hours. I forbid others to interfere in the course of this historical experiment. After 8 hours, I will leave the water and as everyone can testify, I still will be alive. This experiment will prove once and for all that there are supernatural powers and that pure human will is stronger than claimed natural laws and the laws of classical logic.

### 3. Results

Our everyday experience and logic possess the capacity to arm us against errors in reasoning especially at higher and more abstract scientific levels.

#### THEOREM 24.11.2019.A.1. MODUS INVERSUS IS GENERALLY VALID

Premise 1: *if* (sex did occur is false)  
*then* (being a father of a child is false).

Premise 2: Sex did occur is false.

Conclusion: Being a father of a child is false.

PROOF.

Example 1 describes a very private situation. It is undisputed that the husband and his wife had no sex for more than 15 years. It is undisputed that on November 24<sup>th</sup>, 1800 there were no other possibilities for a woman to become pregnant but to have sex with a man. It is undisputed that the wife gave birth to a child. Therefore, the husband worries, how can I be the father of the child if we both had no sex for more than 15 years. According to modus inversus, *if* (sex did occur is false) *then* (being a father of a child is false). The husband concludes correctly that he is not the father of the child. There is no doubt, the wife has gone astray and has cheated the husband.

QUOD ERAT DEMONSTRANDUM.

The following 2x2 table may illustrate this example in more detail.

**Table 2. Modus inversus**

		Being a father of a child		
		$R C_t$		
Sex did occur $R P_t$		+0=false	+1=true	
		+0=false	+1	
+1=true	+1	+1		
			1	

**THEOREM 24.11.2019.A.2. MODUS INVERSUS IS GENERALLY VALID**

Premise 1:        *if*        (gaseous oxygen is present is false)  
                       *then*      (magician is alive is false).

*Premise 2:*                      Gaseous oxygen is present is false.

*Conclusion:*                    Magician is alive is false.

PROOF.

Example 2 illustrates again the use of modus inversus. It is undisputed that the magician conducts the experiment voluntary due to his own different motives and thoughts. It is undisputed that there is no gaseous oxygen within the swimming pool at all. It is undisputed that the magician could not escape out of the swimming pool as the audience could see. During the experiment, the magician died and the people were witness of an unnecessary death based on wrong thinking, shocked and justifiably conclude. Modus inversus is correct, *if* (gaseous oxygen is present is false) *then* (magician is alive is false) and much more than this. The free will is not stronger than the laws of objective reality. Objective reality is the omnipotent “reviewer” which has the potential to correct errors in human reasoning.

QUOD ERAT DEMONSTRANDUM.

The following 2x2 table may illustrate this example in more detail.

**Table 3. Modus inversus**

		Magician is alive		
		$R C_t$		
		+0=false	+1=true	
Gaseous oxygen is present	$R P_t$ +0=false	+1	<b>+0</b>	
	+1=true	+1	+1	
				1

**Remark.**

There is much misconception in science and in human minds. Scientist may be mistaken and do harm without harboring any bad intentions. However, wrong thinking or misconception can do harm for an individual and for the community as such and should be corrected as soon as

possible. Therefore, those who are of the opinion that modus inversus is worthless and refuted are invited to repeat the experiment of the magician above publicly as soon as possible but completely under their own responsibility. Since modus inversus is invalid, there is nothing to fear. However, what if modus inversus is valid?

### **THEOREM 24.11.2019.B.3. MODUS INVERSUS IS GENERALLY VALID**

Premise 1:

*if*  $(+0 = +1)$  false)

*then*  $(+1 = +2)$  is false).

*Premise 2:*

$+0 = +1$  false.

*Conclusion:*

$+1 = +2$  is false.

PROOF.

Starting with  $+0 = +1$  and adding  $+1$  we obtain  $+1 = +2$ . Therefore, *if*  $(+0 = +1)$  is false *then*  $(+1 = +2)$  is false. QUOD ERAT DEMONSTRANDUM.

### **THEOREM 24.11.2019.B.4. MODUS INVERSUS IS GENERALLY VALID**

Premise 1:

*if*  $(+0 = +1)$  false)

*then*  $(+2 = +3)$  is false).

*Premise 2:*

$+0 = +1$  false.

*Conclusion:*

$+2 = +3$  is false.

PROOF.

Starting with  $+0 = +1$  and adding  $+2$  we obtain  $+2 = +3$ . Therefore, *if*  $(+0 = +1)$  is false *then*  $(+2 = +3)$  is false. QUOD ERAT DEMONSTRANDUM.

In the following, we are repeating these experiments with different positive natural number where  $n$  goes to positive infinity.

### **THEOREM 24.11.2019.B.5. MODUS INVERSUS IS GENERALLY VALID**

Premise 1:

*if*  $(+0 = +1)$  false)

*then*  $(+(n-1) = +n)$  is false).

*Premise 2:*

$0 = +1$  false.

*Conclusion:*

$+(n-1) = +n$  is false.

PROOF.

Starting with  $+0 = +1$  and adding  $n-1$  we obtain  $+0 + (n-1) = (n-1)+1$  or  $+(n-1) = +n$ . Therefore, *if*  $(+0 = +1)$  is false *then*  $(+(n-1) = +n)$  is false. QUOD ERAT DEMONSTRANDUM.

### **THEOREM 24.11.2019.B.6. MODUS INVERSUS IS GENERALLY VALID**

Premise 1:

*if*  $(+0 = +1)$  false)

*then*  $(+n = +n+1)$  is false).

*Premise 2:*

$+0 = +1$  false.

*Conclusion:*

$+n = +n+1$  is false.

PROOF.

Starting with  $+0 = +1$  and adding  $n$  we obtain  $+0 + (n) = (n)+1$  or  $+n = +n + 1$ . Therefore, *if*  $(+0 = +1)$  is false *then*  $(n = +n + 1)$  is false. QUOD ERAT DEMONSTRANDUM.

The modus inversus is valid even if  $n$  approaches positive infinity and is generally valid.

### **THEOREM 24.11.2019.C.7. MODUS INVERSUS IS GENERALLY VALID**

Premise 1:

*if*  $(+0 = +1)$  false)

*then*  $(-1 = +1)$  is false).

*Premise 2:*

$+0 = +1$  false.

*Conclusion:*

$-1 = +1$  is false.

PROOF.

Starting with  $+0 = +1$  and adding  $-1$  we obtain  $-1 = +1$ . Therefore, *if*  $(+0 = +1)$  is false *then*  $-1 = +1$  is false. QUOD ERAT DEMONSTRANDUM.

### **THEOREM 24.11.2019.C.8. MODUS INVERSUS IS GENERALLY VALID**

Premise 1:

*if*  $(+0 = +1)$  false)

*then*  $(-2 = -1)$  is false).

*Premise 2:*

$+0 = +1$  false.

*Conclusion:*

$-2 = -1$  is false.

PROOF.

Starting with  $+0 = +1$  and adding  $-2$  we obtain  $-2 = -1$ . Therefore, *if*  $(+0 = +1)$  is false *then*  $-2 = -1$  is false. QUOD ERAT DEMONSTRANDUM.

In the following, even if we repeat these experiments with different negative natural numbers where  $n$  goes to negative infinity, the result is the same. Modus inversus stays generally valid.

### THEOREM 24.11.2019.D.9. MODUS INVERSUS IS GENERALLY VALID

Some authors prefer to base their own thinking upon unproven allegations or logical fallacies. Sometimes, it is necessary to correct the same publicly.

CLAIMS.

$$\text{Statement 1: } (+0 < +1) \text{ is true.} \quad (7)$$

$$\text{Statement 2: } (+0 < +2) \text{ is true.} \quad (8)$$

According to modus inversus, starting with

$$\text{Premise: } (+1 < +0) \text{ is false.} \quad (9)$$

and combining with (8) some prefer to obtain

$$+1 < +0 < +2 \quad (10)$$

and at the end

$$+1 < +2 \quad (11)$$

and true statement, which is a contradiction. Modus inversus is defined as, *if* (premise is false) *then* (conclusion) is false. This is not the case, therefore, modus inversus is refuted.

#### DISPROOF OF A CHAIN OF ENDLESS AND PURE NON-SENSE.

Readers hair may stand on end at the sight of such a logic. As typical for authors with none effective education at an appropriate university or for authors with a very good education at a university but with ideologically guided and abject motives several things are mismatched and rules of logic and reasoning are brutally misused. An operation which justifies the jump from equation (9) to equation (10) is not explained in detail and obviously ex cathedra just done the way an author may prefer. However, it is claimed that equation (10) is a combination of equation (9) and equation (8) by which operation are both equations combined? The reader can guess. However, it is claimed that logic used, but what kind of logic is not clear. The reader can guess again. I must guess, it is classical logic. According to classical logic, it is necessary to consider that  $((+1 > +0) \text{ is false}) \cap ((+0 < +2) \text{ is true}) = \text{false}$ , where  $\cap$  denotes the logical operation conjunction. In other words, the statement at equation (10) is false. Now and without any sense or any explanation of the operation used, by hocus-pocus or by the effect of an unknown

conjuring trick, as a friend of mine once mentioned, something which is obviously just false  $((+1 > +0) \text{ is false}) \cap ((+0 < +2) \text{ is true})$  is turned into something true  $(+1 < +2)$  at the equation (11). This is much more than a normal human brain can tolerate. At first sight, the result of the current disproof supports the thesis that **it is without any sense to waste time on contributions published by authors anonymously** as long as the same are not discriminated by the authorities because such authors avoid the possibility to lose their face completely in the public. QUOD ERAT DEMONSTRANDUM.

#### 4. Discussion

One can hardly help thinking that the main goal of authors who attack *modus inversus* contrary to all scientific rules and the rules of engagement on the scientific “battle” field is to promote unnecessary and even risky and harmful scientific positions and inquiry and at the end to hamper scientific investigations. In fact, it is not all the time possible to use direct proofs i. e. like *modus securus* (Barukčić, 2019c) to achieve some scientific progress. We need more and *modus inversus* (Toohey, 1948) is one of the methods which enriches the scientific methodology. Especially, centuries old mathematical poetry, must be reviewed for logical consistency from the beginning. *Modus inversus* is an effective scientific weapon in the hands of an investigator to detect inconsistencies in the to many time unnecessary highly abstract and omnipotent mathematics. The end of the dictatorship of mathematics and of mathematicians over the scientist is approaching, thanks to *modus inversus*. Mathematical poetry and pure mathematical non-sense have no longer a place to hide.

#### 5. Conclusion

***Modus inversus*** is generally valid.

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## Author Contributions

The author confirms being the sole contributor of this work and has approved it for publication.

## Conflict of Interest Statement

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. There are no conflict of interest which exists according to the guidelines of the International Committee of Medical Journal Editors. I was forced to pause other more important project to accomplish this paper.

**In the future, I reserve myself the right not to react on public statements or publications which do not correspond formally or technically to minimum scientific standard or which are claimed or published anonymously. Only questions of understanding formulated in an appropriate way and even anonymously may be considered by myself to be answered. Ilija Barukčić, Jever, Germany, 24.11.2019**

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