A Refutation Of Ilija Barukčić's Modus Inversus And Conclusions Following From It

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1 Abstract

Over the last few years there have been a number of papers published on vixra.org by the independent researcher Ilija Barukčić that proclaimed refutations of some of the most fundamental concepts in mathematics and physics. Particularly topics revolving around the number 0 such as multiplication by zero [1], zero as the neutral element of the additive group of the reals [2], the factorial of zero [3] and the division by zero (particularly $\frac{0}{0}$) [4] appear frequently in these works. To arrive at these conclusions a particular logical formalism called *Modus Inversus* [5] is frequently used by the author as proof. As described by the author the modus inversus demands that a logically false premise must lead to a logically false conclusion [6]. The objective of this paper is to show that this formalism is inherently logically unsound. To accomplish this examples will first be shown where the modus inversus leads to logical contradictions. This will then be further extended to show that assuming the modus inversus to be true automatically entails assuming that two distinguishable entities can not share properties.

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1 [1], [2]
2 [1], [2]
3 [1], [2]
4 [1], [2], [3]
5 [1], [4]
6 [4]

2 Counterexamples

2.1 Counterexample based on inequalities

To construct the first counterexample the true statements

$$0 < 1 \tag{1}$$

$$0 < 2 \tag{2}$$

are established. The logically false premise

$$1 < 0 \tag{3}$$

is then assumed as starting point. With (2) it would then logically follow that

$$1 < 0 < 2 \tag{4}$$

and thus

$$1 < 2 \tag{5}$$

According to modus inversus since the starting point is a logically false premise a logically false conclusion should be reached. However, $1 < 2$ is obviously true. As such a contradiction arises in the formalism of modus inversus.

2.2 Counterexample based on even numbers

To construct the second counterexample the set of even numbers N_2

$$\mathbb{N}_2 = \{x \in \mathbb{R} | \frac{x}{2} \in \mathbb{N}\} \tag{6}$$

aswell as the true statement

$$2 \in N_2 \tag{7}$$

are established. As a starting point the logically false premise

$$2 = 4 \tag{8}$$

is then chosen. (8) in combination with (7) would then imply

$$4 \in N_2 \tag{9}$$

since if 2 is an even number, so has to be 4 if they are equal. However, 4 is indeed an even number since $\frac{4}{2} = 2 \in N$. Contrary to this modus inversus would imply that this conclusion is wrong and 4 is an uneven number.

3 General proof of logical unsoundness via sets

In this section it will be shown that under modus inversus two distinguishable entities sharing properties is not possible.
Let us define two entities A and B as sets with their properties a_i with $i \in 1, 2, 3, ..., n$ and b_j with $j \in 1, 2, 3, ..., m$ as elements so that $A = \{a_1, a_2, a_3, ..., a_n\}$ and
$B = \{b_1, b_2, b_3, ..., b_m\}$.
It is further established that $A \cap B = S \neq \varnothing$. The elements of S are further dubbed s_q with $q \in 1, 2, 3, ..., k$ and $k < i, j$.
Additionally the set $(A \cup B) \setminus S = N \neq \varnothing$ is established. The elements of N are further dubbed n_p with $p \in 1, 2, 3, ..., l$.
Since $N \neq \varnothing$ it follows that $A \neq B$ since $\forall n_p \in N : n_p \in A \veebar n_p \in B$.
As modus inversus demands the false premise $A = B$ will now be set as starting point of our proof. Since both sets are equal every subset of A must also be a subset of B. Since S is a subset of A it can then be concluded that S is a subset of B. According to modus inversus this conclusion has to be false since it follows from a false premise. This would either imply that $S \notin B$ which is a direct contradiction to the definition of S as $S = A \cap B$ or that two sets can be equal while containing different elements which is also trivially untrue since that would automatically mean that $A \neq B$.
Since we interpreted our sets as entities and their elements as their properties this shows that the existance of a set of shared properties S between two entities A and B can always be denied with modus inversus by starting with $A = B$. As such if one were to hold the modus inversus true the concept of two distinguishable entities sharing a trait would be logically impossible, which is obviously untrue.
The modus inversus would only work for elements of N since these are the only elements of $A \cup B$ that are not elements of $A \cap B$ and would thus correctly lead to a contradiction.

4 Examining the conclusions made by Ilija Barukčić under the context of the established general disproof

When considering the results of section 3 of this paper it becomes apparent that most of the refutations by Ilija Barukčić that were constructed with modus inversus boil down to the fact that the modus inversus does not logically allow two seperate entities to share properties.
Let us first examine his refutation of the multiplication by 0 which goes as follows[7]:

$1 = 2$ is a false premise

$1 \cdot 0 = 2 \cdot 0$

$0 = 0$ is a true conclusion so multiplication by zero is incorrect.

The fact that multiplication by 0 leads to contradictions in modus inversus is a direct consequences of modus inversus not being able to deal with shared traits. The entity 1 and 2 are not equal but still share the trait that both of them are mapped to 0 by multiplication by 0. In the context of the disproof shown in section 3 the entities 1 and 2 would be described as the sets A and B with the properties a_i and b_j. The property multiplication by 0 mapping the entity to 0 would then be part of the described subset S. Since such a thing is not possible in modus inversus a contradiction arises.
The same argument can be made for his refutation of the factorial operation[8]:

$0 = 1$ is a false premise

$0! = 1!$

$1 = 1$ is a true conclusion so the factorial operation is incorrect.

Once again the trait that the factorial operation maps the entitiy to 1 is shared between 1 and 0 and thus leads to a contradiction in modus inversus.
In general the way the modus inversus is used in these arguments is always the same. Two entities are assumed to be equal at the start. As shown in section 3 this proof method only works if a trait is used for verification of the premise that is not shared between the two entities which was interpreted as the set of properties N earlier in this paper.
In the context of basic algebraic proofs this means that all the mathematical operations done in the proof have to be injective since two entities could otherwise be mapped to the same entity which would again be a shared trait. However, the proofs in Ilija Barukčić's works make use of non-injective operations such as addition by 0[9] or the factorial operation[10] for their highly controversial conclusions and are thus illegitimate.

[7] [5]
[8] [1]
[9] [1]
[10] [1]

5 Conclusion

It has been demonstrated that the method of using the so called *Modus Inversus* of Ilija Barukčić is entirely methodically unsound in the way it has been used in the presented papers. As such this paper can be seen as a direct refutation of the present papers of Ilija Barukčić that rely on the modus inversus and those that are possibly to come in the future.

6 References

1. Ilija Barukčić, *The interior logic of inequalities*
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4. Ilija Barukčić, *Modus Inversus – if (Premise is False) Then (Conclusion is False)*
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