

Review of: "Bell's theorem is an exercise in the statistical theory of causality"

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The Manuscript by Richard Gill is about the work of Marian Kupczynski (MK) who claimed repeatedly (i.e., since many years) that Bell's theorem (about quantum nonlocality) doesn't apply to what he calls contextual theories. Richard Gill has already published several relevant comments concerning the work of MK and the present one is essentially a sequel of the recent paper "Kupczynski's Contextual Locally Causal Probabilistic Models Are Constrained by Bell's Theorem (2023, Quantum reports)" written with Justo Pastor Lambare.

Moreover, this work is interesting and I am sympathetic with the general argument presented in this shorter article. The author provides an analysis of an experiment proposed by MK to refute or define a loophole to Bell's theorem on quantum nonlocality. MK error is relatively similar to similar mistakes by de la pena and Cetto as well as by Lochak in the 1970's all already debunked long ago by John Bell himself. The present paper is useful in the sense that it can perhaps help to limit the propagation of recurrent mistakes concerning Bell's theorem.

I however think that the manuscript could be improved a bit on the general discussion.

Fundamentally, the general analysis of MK is about what we must correctly call superdeterminism but that MK confuses (in my opinion erroneously) with a form of contextuality. This superdeterminism / fatalistic / conspiracy loophole is associated with a violation of measurement/ Statistical independence MI which is a central (natural) axiom used in the derivation of Bell's theorem (already discussed by Bell Clauser and Shimony).

MK however thinks that superdeterminism is not needed and that we can abandon MI without it by invoking contextuality. In my opinion despite all his claims he never succeeded and a proof is indeed given here by Gill.

In my opinion what is missing here is a general discussion in the introduction or conclusion about the family or errors to which the MK claim belongs. This could help the reader to understand more the problem. Similarly, references about the old relevant literature could be useful

Specially, as also discussed in the recent paper written with Lambare, MK uses wrongly a reasoning going back to Arthur Fine on joint probabilities for 4 observables. May be Gill could add few words on that issue as well.

With this minor corrections I think this work could be useful for the community interested in quantum foundations.

