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1 message

PLoS ONE@plos.org <PLoS ONE@plos.org>

Mon, Aug 9, 2010 at 1:12 PM

Reply-To: osporns@indiana.edu

To: joshuav@jhu.edu

Dear Dr. Vogelstein,

Thank you for submitting your manuscript "Are mental properties supervenient on brain properties?" to PLoS ONE. After careful consideration, we believe that your study has the potential to be published by PLoS ONE provided you revise a few fundamental aspects of your paper, as described below. You must revise accordingly and explain your revisions in a covering letter if you wish for us to consider your paper further for publication.

While your manuscript cannot be accepted in its present form, we are willing to consider further a revised version in which the issues raised by the academic editor (and reviewers) have been adequately addressed. We cannot, of course, promise publication at that time.

Should you decide to revise the manuscript for further consideration here, your revisions should address the following specific points:

Both reviewers acknowledged that your paper contained an interesting idea, but both also agreed that the exposition of the idea is too insubstantial. The second reviewer provides some specific comments in that regard that you might consider for the revision. Overall, while there was only weak support for this paper among the reviewers, I believe a thoroughly re-worked and expanded manuscript may yet make a useful contribution to the literature on the topic of "supervenience". However, I will need to consult the reviewers again, and the paper can only move forward if their support increases significantly.

Please attend closely to our "Guidelines for Authors" and "Submission Checklist" when revising your manuscript. Upon resubmission, I will send the manuscript for further review (back to the original reviewers) to evaluate this. Please include a rebuttal letter with your re-submission providing a detailed list of responses to the comments raised and the changes you have made in the manuscript; this response to the reviewers should be uploaded as a REBUTTAL LETTER file.

Please also provide a marked-up copy of the changes made from the previous article file as a SUPPORTING INFORMATION file. This can be done using 'track changes' in programs such as MS Word and/or highlighting any changes in the new document.

If possible, please resubmit your revised manuscript within 60 days. We quite understand that your revisions may take more time than this and would be happy to extend your due-date (simply email plosone@plos.org with an estimated date for the resubmission of your manuscript).

When your files are completely ready please resubmit your manuscript by logging on to our journal manuscript system at <http://one.plosjms.org/>; please ensure that you follow the 'revise manuscript' link to do this, rather than resubmitting your revised submission as a 'new submission'.

Thank you for your support of PLoS ONE.

Yours sincerely,

Dr Olaf Sporns
Section Editor, PLoS ONE

Reviewer #1 (Remarks for the Author):

The authors start off with a promising goal, "we frame a supervenience hypothesis in rigorous mathematical terms [...]" and conclude the Abstract claiming their proof would be beneficial to philosophers, statisticians, neuroscientists. What I found in the paper is possibly a new idea, ϵ -supervenience, but unfortunately not much more. The idea per-se is not that revolutionary or deep (almost all deterministic measures can be modified to a probabilistic one), but that alone would not be too much of an issue. The main problem lies in the fact that it is not clear whether this idea can be developed into a theory or not. Certainly it was not developed into one in the current paper, and it is far from it: the work consists of the above-mentioned definition (in mathematical language) and a loosely worked out theorem (not a proper theorem for a mathematician). All this covers about one page. The rest (2-3 pages) is discussion and appendices that do not help making their point any deeper or clearer. There may be a chance to expand/test this idea to a more complex / deeper level to see if some interesting results may arise from it.

(FYI: typos "the" repeated page 2 Line 4. "binary" repeated Page4, Line1. "proofs" instead of "proof" third line from end Appendix 1).

Reviewer #2 (Remarks for the Author):

This is an interesting and provocative paper. It is written in a very compact mathematical style that will make it inaccessible to many interested philosophers and scientists. I urge the author to increase the length of the paper by adding various examples, some of which I suggest below be added to help the reader digest the ideas. I also have some critical remarks about the exposition as such. However, these formal criticisms I leave to the end because they are minor in character.

Let me focus first on definition 1, and its weakened version in definition two, of supervenient. If I understand the notations and the formal concepts behind them, the following is the simple example of supervenient, in the sense of definition one. The example consists of two dice, one red and the other green. The sample-path data on each die constitute a process of i.i.d random variables, one for each trial. But, the two random variables for each trial n , one for the red die and one for the green die, have correlation 1. It is clear what the joint distribution of the two processes is, and as far as I can see, the red die stochastic process supervenes on the green one, and vice versa. I have not checked all the details of the authors' compact notation, but this spirit of my example seems correct. I urge the authors to give such an example just to help the reader. Or, if there is something wrong with my example, use it as a basis for explaining in a useful intuitive way what is wrong with it.

My second main theoretical comment is that the authors should spend more time and space in defending the adequacy of the graph-theoretic notion of isomorphism they are using. I have some skepticism about it. For example, there are many detailed isomorphisms in physics and ergodic theory that cannot be adequately expressed by a graph-theoretic isomorphism. I will not try to work out an example here, but give a simpler set-theoretical one. Consider the general notion of equipollence. Two sets are equipollent, if and only if, there is a one-one mapping from one set onto the other. Now, consider the problem of defining the notion of group-isomorphism for abstract groups. It is trivial to give two groups which are equipollent in the sense of there being a one-one mapping between their two domains, but they are not isomorphic in the sense of groups. Now the authors may have in mind something much more sophisticated in making a broad claim for the power of graph-theoretic notions. If so, a much more detailed and intuitive exposition is needed to persuade persons coming from the variety of disciplines interested in supervenience. In fact, some explicit discussion of some of the classical cases of presumed supervenience would have been very helpful, especially if the authors were to sketch intuitive arguments as to how their approach could be used or not to discuss such cases as the effort to reduce or subvert thermodynamics to classical statistical mechanics.

Now, for some minor comments. The authors claim that they give in this paper the first proof the existence of a universally consistent classifier. It seems to me that such a proof belongs in a Journal of

applied mathematics or statistics, not in this paper. But then a reference could be given to it. Second, even if a serious and applicable connected graph could be given for brain circuits, it remains far from clear what the structure would be on the mental or behavioral side of the desired isomorphism. More discussion of this problem would be helpful finally, I suggest Aristotle, and especially his psychological treatise *De Anima* is a much more pertinent reference to Ancient views of the soul that lasted a long time. Moreover, on my reading of the *De Anima* the Concept of the soul as the form of living body does not support an immaterial concept of soul. It is a definite part of the Aristotelian view, unlike the Platonic one, that the forms do not exist separate from matter, and in the case of humans, individual human bodies. For a very explicit statement of this view, see Aquinas, *Summa Theologica* I Q75, Article 4. After all, the *De Anima* was the principal work on psychology in the Western world from Aristotle's time to the Renaissance, and the subject of many commentaries.

Finally, there are some minor flaws in the English. I list some of them. In the first line of the last paragraph of the Abstract, it does make sense to "divide significance into distinct disciplines. I would suggest "can be appreciated in distinct disciplines", but this too can probably be improved. Second, in the second line of the result section insert "that of" before "knowing" to read "...some mental property such as that of knowing calculus." Third, in the fourth line from the bottom of Appendix 1, insert the verb "are" between "properties" and "finite".
