
Correspondence

The hypothesis

Denys N Wheatley

BioMedES UK; www.biomedes.biz

DOI: 10.20316/ESE.2018.44.18014

This journal reaches editors, but much of the information in it – advice, discussions, opinions and suggestions – seldom, I suspect, reaches authors who would benefit considerably from it, when and where appropriate. I have no idea how much interaction occurs at this level, but it seems unlikely that many authors follow its content, other than editors who are authors themselves. Nevertheless a channel exists from individual editors of journals to their authors in their respective guidelines on the submission of articles.

The scientific paper is now quite rigid and unforgiving in its format and presentation. Indeed it has almost got to the point where a template could be sent to authors wishing to submit copy. The authors fill in the specific information in each section, making things simpler and standard, and everything becomes even more rigid. The situation is unlikely to change in the foreseeable future. But I would like under these circumstances to make a suggestion (see below), and would also be glad to have members' reactions. However, having written quite a few essays over the last 4–5 years, I am disappointed that little if any feedback has been forthcoming.

Papers submitted to scientific journals can loosely be put into about 4 categories: (i) reviews; (ii) discussion and commentary papers; (iii) methods and technological reports on phenomena – measurements and observational notes (in effect, factual data); and most abundantly, (iv) experimental articles bringing in new findings, confirmation or rejections on previous publications, and here I include data-mining. I will confine my remarks to category (iv). Unlike the others, the object in almost every experimental article is to answer a specific question, a hypothesis. Knowledge will advance if reasonable answers are found, even if later they have to be revised or rejected as better ones are postulated. The great philosopher, Karl Popper, maintained hypotheses ought to be tested to destruction rather than positive support always being sought to uphold them. If one persists after strenuous examination, it may have some truth in it. If it integrates well within the wider picture, it will certainly be of benefit to our knowledge of nature and the universe. The importance of supportive evidence – of confirmatory findings by

independent researchers – will be more substantial than those found wanting.

It is a misconception that a phenomenon requiring an understanding has a single rational explanation; there may be several ways at looking at the same thing. Change the context, the conditions, etc, and another explanation may be more appropriate. Experimenters coming in from a different approach might proffer a quite different hypothesis, but hopefully bringing in a broader vista that eventually reaches closer to a consensus. Linus Pauling remarked that it is best for the researcher to formulate several possible hypotheses and have a selection process based on existing relevant findings after a thorough literature search – not just of the last 5–10 years – to choose which one(s) seems to be most appropriate in the circumstances. On this account, each approach needs the formulation of a clear and succinct hypothesis, with the above proviso in place. Importantly, this will be instrumental in the experimental design, and will always sharpen the focus of the researcher(s).

It follows that all reasonable papers in category (iv) should state outrightly and explicitly the hypothesis under test. Not all papers do this, often making it necessary for readers to search for one. Usually this means one has to go to the end of the Introduction, where a new experimental approach is mentioned, but even then not always in the form of a clear hypothesis.

So now I come to my simple suggestion. Following the title of a paper (preferably not a pre-emptive one which gives the answer before the question has been posed), the *first heading ought to be "Hypothesis"*, and then the next should be Abstract when this is unstructured. If the Abstract is structured, it should be before Background, Methods, Results and Conclusions in the subsections usually required. As already mentioned, the hypothesis should be short (1-2 sentences), explicit and unambiguous. It might even be in Italics or Bold type to make it stand out even more obviously. This today is what the reader needs most of all, especially as he or she is being bombarded with an ever-expanding literature, even on the most specialised of topics.