The function of the discussion section in academic medical writing

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There is growing interest in the dissemination of research results and concern for how important messages can be most efficiently disseminated. A recent editorial on the writing of discussion sections and the problems connected with this provided a timely contribution.[1] The particular problem Docherty and Smith perceive is that authors use "rhetoric" to make claims about their findings which "go beyond the data." The function of the discussion section is seen as simply a way to "sell the paper" and as such it is "the weakest part of the paper … careful explanation gives way to polemic." The suggested solution is that contributors should be asked to write highly structured discussion sections as a way of imposing discipline and banishing speculation. The argument in favour of doing so is "[m]uch the same as that for structured abstracts," which "have been shown to include more important information than unstructured summaries."

In this article, we highlight several difficulties with this line of argument. We argue that discussion sections already have a fairly conventionalised structure; that some speculative language in the discussion section is desirable; and that, even if speculative language were not desirable, it would be impossible to get rid of it by virtue of a tighter structure.

Summary points

There is concern that authors speculate beyond their results when they write discussion sections and that these sections should therefore be formally structured

If authors do not go beyond their results, however, their discussion is tautologous

In any case, speculation cannot be removed by imposing structural rules

What is needed to assist authors is detailed, evidence based guidance about how to write discussions

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Methods

To find out how discussion sections are currently structured, we did an informal survey of original papers (excluding short reports) published in the *BMJ* from March to May 1999. We also did a literature review of the wider linguistics research on the topic. The way in which discussion sections are currently structured is summarised in the box. We discuss these informal data in relation to Docherty and Smith's proposal.[1] The structural conventions that operate in discussions are well understood by language specialists.[2] Where discussion sections are concerned findings tend, unsurprisingly, to mirror Docherty and Smith's proposals (box), at least in broad terms.[3 4]

The desirability of speculation

Particular studies stand or fall, of course, by such matters as whether a well designed method has produced statistically significant results. But to step back from the particular study to the general scientific context in which it takes place is to acknowledge at once the commonplace view that scientific statements have values implicit in them—that science is manufactured or a fabrication rather than a mirror held to nature.[5–7]

One way that science deals with this is to separate out the data and to determine what these mean. It is usually accepted that separating out the data is the prerogative of the results section, where there are statistical conventions at work about what the researcher may claim as "significant," whereas determining how they are "relevant" is the prerogative of the discussion section.

A discussion cannot simply repeat the results as they seem beforehand or it is tautologous. In this sense, every discussion is obliged to "go beyond the evidence." Every paper must reach a conclusion that is not contained in its results. And not all statistically significant findings have clinical relevance. In quantitative research, therefore, a central aim of discussions is to reinterpret the significant as relevant—and that requires subjective interpretation of data. A finding may even be reinterpreted as "ironic"[8] or as not being merely "contrary to current opinion" but a "challenge,"[9] and so on. And there will, always, be statements not only about what the statistics declare "is" the case but judgments about what "may" be the case.

Subjectivity of this kind—going beyond the data in this way—is a means of providing a context for the reader, of making science more than a list of facts or of numbers. Indeed, if we accept that science is in some sense never value free, then the most rational way of dealing with this particular difficulty is to ask for the evaluative bits of a study to be as explicit as possible. (One formal way of promoting this is to use a bayesian approach.) This makes it easy for readers to understand the nature of the claims being made and

Structural conventions in discussion sections according to Docherty and Smith[1]

- Statement of principal findings
- Strengths and weaknesses of the study
- Strengths and weaknesses in relation to other studies, discussing particularly any differences in results
- Meaning of the study: possible mechanisms and implications for clinicians or policymakers
- Unanswered questions and future research

for the non-expert reader (the vast majority, probably, in the case of each article) to make sense of the climate in which a particular debate is happening.

Getting rid of speculation

It is from the "maybe" and "perhaps" of speculative statement that future hypotheses are generated. If a scientific paper points forward, it must point at the unknown. Indeed, Docherty and Smith recognise this need for speculation under "unanswered questions and future research" and yet seem inconsistently to try and get rid of it.

The way that speculation is discussed has generated a substantial literature in applied language study, with two important manifestations. One is concerned with the extensive literature on hedging[9–12] or, more broadly, the way writers calibrate the statements they make as (comparatively) true or false or having (comparatively) positive or negative consequences. The other manifestation is the way in which reporting verbs are used to discuss one's own research or that of others.[13] What is at stake here is the comparative strength of claim signalled by sentences such as "the earth is flat," "it is beyond argument that the earth is flat," and "maybe the earth is flat" or "Smith argued that X," "Jones suggested that Y," and "we showed that Z."

On certain analyses every sentence carries within it a marker of strength of claim, whether in a results section or a discussion section. A sentence like "Saturn is the only planet with rings," which was widely taught in textbooks for many years, can be said to have some implicit strength of claim such as "It is a fact that…."

Strength of claim cannot be wished away by structuring the discussion, not least because claims are normally encoded at the sentence level ("perhaps X is the case" is a claim made about this sentence), whereas the kind of structural divisions that Docherty and Smith suggest will normally be several sentences long. Furthermore, the idea that authors are badly behaved and unacceptably inflate their results when they come to discuss them was not borne out by a recent comparison of results and discussion sections.[14]

The way forward

In short, one can take the science out of rhetoric but not the rhetoric out of science. The function of the discussion is to discuss: it should therefore be discursive. Words are not reductionist nor can they have their rhetoric extracted. If they were, or if they could, it is hard to see why people would need both words and numbers.

It is unfortunate that in an environment in which so many individuals must publish for the sake of their own careers, and so many doctors must read with understanding for the sake of their patients, that only a limited effort is made to understand the structure of written papers. It is an eminently teachable topic.

Detailed, evidence based guidance is needed for potential authors and can be derived from a study of the structure of articles that are successfully published in leading journals. Such guidance would go beyond the suggestions in the editorial and well beyond the general suggestions made, for example, in the statement by the international committee of medical editors.[15] And it would be guidance rather than instruction, and certainly rather than imposed structure.

With all this, concern about letting speculation run amok is still a valid issue for scientists. Speculation cannot be contained simply by imposing structure on discussions. Rather, there are other ways to keep science in check. Peer review and training in research methodology are but two.

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