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## DISCUSSION

# Writing for publication: Argument and evidence

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### KEYWORDS

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**Summary** The rules for writing a research report for publication are well defined but are much less clear for scholarly scientific papers.

The purpose of this paper is to enable new writers to confidently apply the skills of scientific writing within a scholarly paper for publication.

Similarities and differences between scientific argument and debating are discussed. Achieving the right 'tone' and emphasis in writing is considered. How to use the correct verb tense is outlined. The importance of a clearly defined question is explained. The elements of an effective scholarly paper are presented and examples given. The elements are the: question, thesis, introduction, body of the paper, conclusion and finally, an abstract.

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## Introduction

In an earlier paper: *Writing for Publication: the Basics*<sup>1</sup> I presented basic English writing skills. These skills are: careful and consistent word choices; short, clear and direct sentences; writing in the active voice; writing unified, coherent and well structured paragraphs; and maintaining brevity. The 'basics' paper<sup>1</sup> is a necessary foundation to being able to write for publication but, due to word limitations, it does not go far enough in teaching the skills of writing for publication. Clear thinking and the development of logical, coherent argument are the keystones of all scientific endeavours and this should be reflected in all papers that are submitted for publication. New writers often have difficulty because they try to write on an ill-defined topic. This results in a paper without an argument. Writing on an ill-defined topic causes

the writer to ramble on, to explore multiple aspects of the topic, without ever really taking a position. A scholarly scientific paper that is not in the form of argument and evidence is usually confusing and boring. The reader of this type of paper is initially left with the vague feeling that maybe they have missed the point. Experienced journal reviewers, however, easily recognise that poor writing, not poor reading, is the source of their feeling of having missed the point. This article aims to help you to write in effective, engaging and interesting ways and that means taking a position and then defending it with evidence.

There are good texts on academic writing.<sup>2–9</sup> For the majority of potential writers, however, these books remain unread. There are a number of possible reasons why midwives do not read books on how to write, these reasons were discussed in the previous paper.<sup>1</sup> A review of midwifery and nursing journal articles was also presented in that paper. In the 'basics' paper I argued that existing articles on writing for publication focus mostly on the process of writing and publication process.<sup>10–19</sup> Alternatively the articles are limited, like Ann Thomson's paper, to how to write a research

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report.<sup>20</sup> The structure for writing a research report is well defined and expected by all journal editors. For more in depth coverage about writing research papers readers are recommended Zeiger's *Essentials of Writing Biomedical Research Papers*<sup>4</sup> What is less clear is how to write the other types of academic papers for journals; it is this gap that the paper is intended to fill.

What is needed, I believe, is a brief, simply written, guide to writing a scholarly paper for publication. The skills of academic writing are easier to learn from this paper. This is because the paper is focussed on the knowledge and skills gaps that I currently encounter in the writing of research higher degree students and new writers of journal articles. Further, midwives should find it easier to learn the required skills from the present paper because the examples given are from articles written by and for midwives. The examples which I use here are re-worked sections of previous papers that I have either authored or co-authored. The discussion I present below on how to structure a scholarly paper is consistent with the texts on academic writing that I have already mentioned. Prospective authors can take my suggestions as advice that does not have to be slavishly followed. There is less definitive agreement about the elements a scholarly academic paper than there is about a research report.

## The scientific argument

A scientific argument is a form of debate. A debate is a formal method of taking a position and arguing for what you want the audience to believe. Debating involves both logical argument and emotional persuasion. For example, lawyers arguing in a court room or politicians arguing in parliament are forms of debating. In that form of argument there are two sides that argue two different positions about the topic of debate. A scientific argument, like a debate, is based upon a clearly defined topic. As only one side is being presented in a paper for publication it is important to think of your paper as one 'side' of an academic argument. Authors must also be ready to have their ideas criticised by other scientific writers; that is what makes it an argument. The advancement of scientific knowledge depends upon open, clear and direct argument and evidence.

## Tone

Unlike legal or political arguments scientific arguments should read as a dispassionate search for 'truth' or better knowledge. Direct attempts at emotional persuasion are not acceptable. Your tone should be somewhat humble and certainly, not arrogant. Your writing should demonstrate that you are respectful of writers who have a different view. Your respect for midwifery and women should also be evident. You should use woman-centred language: e.g. 'woman' not 'lady' or 'patient'.

You are advised to avoid qualifying words or phrases that are meant to convey how strongly you believe something. For example if you find that you have written words like 'very' 'extremely' 'strongly' or 'always', this probably indicates that you are trying to influence the reader to your position by use of emotion rather than argument and evidence. What is

required is to remove these qualifying words that are meant to provide additional emphasis and instead present better examples or evidence.

## Emphasis

Not all the information that you could include in your argument is equally important. You want the reader to get your main message. You do not want readers getting confused and thinking that less important information in the paper is the main message. You need, therefore, to focus and limit your argument. According to Zeiger<sup>4</sup> the techniques for sharpening emphasis include:

1. Stating, rather than implying, important information.
2. Emphasising important information by placing it first and/or last.
3. Condensing, subsuming or omitting less important information.
4. Signposting important information.
5. Repeating important information.

Much of the skill of scientific writing concerns you being clear about what is most important in your paper and then emphasising it. Having a guiding research question, writing a thesis statement, a conclusion and an abstract are all opportunities to emphasis important information. In my experience writers usually write too many words initially and they are frequently not the best words for conveying the most important information. Sometimes writers find that they have strayed from directly answering their research question. In the editing process, more important information should be emphasised and less important information should be removed or de-emphasised. Removing, condensing or sub-subsuming less important information sometimes involves removing entire paragraphs. It always involves sentences within paragraphs. Writers always have to edit their work (usually multiple times). This is needed to achieve a paper that clearly and succinctly conveys the main message, backs it up with good evidence and does not confuse the reader.

## Verb tense

The tense of a verb, past or present, depends upon the type of statement and its meaning. When writing about what was done, or what was found, the verb should be written in the past tense because it was done or found in the past. For example: "We reviewed (past tense) the research literature". "We found (past tense) that woman who experienced (past tense) a home-like environment for labour had (past tense) fewer medical interventions in birth."

A knowledge statement it is written in the present tense because knowledge is current. Indeed the statement above can be written as a knowledge claim if you believe there is sufficient evidence to support such a claim. For example "Women who experience (present tense) a home-like environment for labour have (present tense) fewer medical interventions in birth." Another example is: women who smoke in pregnancy are (present tense) more likely to be (present tense) socio-economically disadvantaged.

**Table 1** Examples of guiding questions

Example 1: In cases of postpartum haemorrhage, can amniotic fluid embolus (AFE) be accurately diagnosed as a causative factor?

Example 2: Why do women continue to smoke in pregnancy?

Example 3: Can the Cochrane Review of birth setting be relied upon to make valid statements about whether or not there may be an added risk of perinatal mortality associated with experiencing intrapartum care in a birth centre?

### The question

The writing of a scientific paper is the end point of a larger project which involves a period of enquiry and reflection. The enquiry phase of the project is most efficient and effective if it is guided by a research problem or question.<sup>21</sup> See Table 1 for example 'questions'.

### The thesis

The actual writing stage should begin with a thesis statement that will organise and limit the scientific argument. A thesis is a positive declaration that the whole paper then seeks to support with argument and evidence. A thesis answers the question of the paper. The thesis is your main point; what it is you are trying to 'prove'. The thesis is the take-home message you want to reader to remember.<sup>7</sup> See Table 2 for examples of thesis statements.

### The introduction

Introductions to scholarly papers take a different form when compared with research papers. Research introductions take the form of writing first about what is already known; then about what is unknown. Next the research question is given. Then the research methods are summarized and finally the significance of the research is stated. In research papers,

**Table 2** Examples of thesis statements

NB: These statements relate to the questions given in Table 1.

Example 1: In cases of postpartum haemorrhage, amniotic fluid embolus may be incorrectly ruled out as a diagnosis because it is not possible to accurately diagnose AFE by any currently available laboratory tests.<sup>23</sup>

Example 2: Smoking cessation programs in pregnancy are ineffective because smoking is addictive and the women who smoke in pregnancy are socio-economically disadvantaged women and lack alternative sources of pleasure and satisfaction in their lives.<sup>22</sup>

Example 3: Because of methodological problems with the original randomised trials the Cochrane review of birth setting cannot be relied upon to make valid statements about whether there may be an added risk of perinatal mortality associated with experiencing intrapartum care in either setting.<sup>24</sup>

**Table 3** Elements of an Introduction to a scholarly paper

- There is a clear and unambiguous question or problem statement
- A brief summary of what is already known on the topic may be given
- Key terms are defined
- There is a clear and unambiguous thesis statement (main message)
- Importance of the paper is made clear (relevance or significance)

therefore, it is normal to write an introduction that encompasses the review of related literature. This section is often labeled 'Background' rather than 'Introduction' in research reports.<sup>4</sup> Most scholarly papers, by contrast, do have an introductory section, because the related literature either forms the body of the paper or it is integrated throughout the paper.

The structure of an introduction for a scholarly paper should begin with a question or problem statement about the topic under consideration. You may present a brief summary of the background literature to identify what is already known. Any key terms should be defined. The thesis of the paper, which is your main message, must be included. The introduction should make clear the importance of your

**Table 4** Example Introduction to a scholarly paper

How has it happened that medicine holds a power monopoly over a natural, rite-of-passage event like healthy childbirth? [PROBLEM STATEMENT] A search of the literature showed that histories of midwifery have been published in the journals for New Zealand, Scotland, Ireland, the UK and the USA (refs). Annette Summer's published a paper that focussed on nursing's takeover of midwifery but her account was limited to the years of the takeover (refs). The current paper incorporates the era that Summers' reported upon and provides an historical analysis of professionalisation of medicine from the mid 19th until the early 20th century. Medical professionalisation was inextricably linked to an obedient nursing profession which in turn was the key player in the eradication of midwifery as an independent occupational group. [BRIEF REFERENCE TO WHAT IS ALREADY KNOWN BASED ON BACKGROUND LITERATURE].

Ultimately social power rests with the State therefore the focus of critical analysis within this paper includes the role that the State played in supporting and legitimising medical domination. An understanding of the socio-historical medical domination and virtual obliteration of midwifery as an independent discipline is contextual to understanding the contemporary organisation of maternity services by the state. The analysis shows that medicine's power strategies are essentially the same today as they were 100 years ago. [THESIS STATEMENT] This is important because it means that midwifery can learn from history and develop more effective strategies to promote and protect for the wellbeing of women and babies. [WHAT THIS PAPER ADDS TO WHAT IS ALREADY KNOWN].<sup>25</sup>

paper in terms of what is known about the topic. You may also briefly outline the structure of the paper but this is not essential. A summary of these elements of a scholarly introduction is presented in Table 3. An example of an introduction to a scholarly paper is presented in Table 4. Please note that I have removed the references to simplify reading. Also, I have inserted comments in [CLOSED BRACKETS] to make clear how the example ‘introduction’ provided is in line with the structural elements outlined above.

### The structure of a paper

The structure of an effective paper follows the same rules about the structure of effective paragraphs. Both a good paragraph and a good paper will demonstrate the elements of unity, coherence and development.<sup>7</sup> Firstly, ‘unity’, which means that each sentence in a paragraph is related to the topic sentence; likewise, each paragraph is clearly related to the thesis of the paper. Secondly ‘coherence’, which means that the relationship between the sentences in a paragraph is clear and logical and likewise, the relationship between each of the paragraphs in a paper is clear. Thirdly, ‘development’, means that main idea of each paragraph is well supported with specific evidence and, likewise, the thesis of the paper is supported with evidence and examples.<sup>4,7</sup>

An example of the ordering structure of a literature review is presented below. This structure was developed in order to answer the question: why do women continue to smoke in pregnancy?<sup>21</sup>

- Introduction
- Australian Anti-Smoking Policy Background (Heading 3, part of introduction)
- Literature Search Strategy: Research on Smoking in Pregnancy
- Quit Smoking Interventions: The Systematic Review
- Smoking Behaviours in the Childbearing Period
- Research about Smoking and Social Disadvantage
- The Physiology of Pleasure and Addiction
- How Women Feel About Smoking in Pregnancy
- Women’s Views on Smoking Cessation Interventions
- Conclusion

This structure is ordered appropriate for the question that was asked because it encompasses all the elements that are needed to fully answer the question. The logic of this structure is that moves from the general to the specific in terms of level of detail (an alternative could be to move from specific to general). The logic of the structure also moves from the more important, or more firmly established, to the less important. Importantly, each structural element is needed to answer the question; there are no side tracks or superfluous sections to the paper.

There are, of course, other logical ordering structures. If one is writing an historical paper, for example, then a chronological order would normally be most suitable. If one is writing about a clinical problem then an appropriate structure might be to state the problem, then give the reasons for the problem, then state the proposed change in practice and finally discuss possible hurdles to be overcome before the new practice can be widely adopted.

Table 5 Elements of effective conclusions

An effective conclusion:

- Concludes the argument; it does not add any new information
- Draws the threads of the argument together
- Provides an answer the question, or the solution to the problem given in the introduction
- Explains how the evidence, provided in the paper, supports the thesis and undermines alternative explanations
- The knowledge presented in a paper for publication must be new
- The implications for practice, research, theory or policy should be specified

### The conclusion

The main function of the conclusion is to conclude; do not add new information. In a conclusion you draw the threads of your argument together. You answer the question, or give the solution to the problem that you set out in the introduction. You should explain how the evidence, provided in the paper, supports your thesis and undermines alternative explanations. In a paper for publication you should show that your paper is presenting new knowledge. You should make clear how this new knowledge relates to prior or existing conceptions of knowledge. The implications for practice, research, theory or policy should be specified. A summary of these

Table 6 Example Conclusion

The conclusion below is part of a paper that was written to answer the question: “In cases of postpartum haemorrhage, can amniotic fluid embolus be accurately diagnosed as a causative factor?”<sup>22</sup>

#### Conclusion

It is not possible to accurately diagnose AFE by any currently available laboratory tests. [THESIS]

The contemporary model of AFE as a form of hypersensitivity explains why large amounts of amniotic fluid do not cause a response in primate models. In the original post-mortem research, doctors excluded 34 of the 42 women had died with suspected AFE. The clinical cases of the excluded women did not differ from the remaining 8 women who had their diagnosis confirmed by finding amniotic matter in their lungs. It now seems likely that the original research, which was conducted over 50 years ago, under-diagnosed AFE due to inadequacies in methods of detection. [UNDERMINES ALTERNATIVE VIEW]

Even today, in cases of postpartum haemorrhage, amniotic fluid embolus may be incorrectly ruled out as a causative factor because of lack of specificity of existing tests. The diagnosis of AFE, therefore, needs to be based on a careful clinical assessment and should be considered in all cases of sudden maternal collapse. It should not be ruled out because of failure to detect amniotic material in the lungs. [IMPLICATION OR SIGNIFICANCE]

**Table 7** Example Abstract

This review of the literature answers the question why do women who continue to smoke during pregnancy? [QUESTION] Research on the effectiveness of quit smoking interventions is reviewed. The physiology of smoking, pleasure and addiction are described. the demographics of women who continue to smoke are compared with those who quit. Women's views on smoking and anti-smoking interventions during pregnancy are discussed. [WHAT WAS DONE TO ANSWER THE QUESTION]

Smoking cessation programs in pregnancy are ineffective because smoking is addictive and the women who smoke in pregnancy are socio-economically disadvantaged women and lack alternative sources of pleasure and satisfaction in their lives. [THESIS]

We recommend a woman-centred continuity of care approach to supporting pregnant women to improve their overall health which, of course, includes quitting smoking for good. [IMPLICATION FOR PRACTICE]

elements of an effective conclusion are provided in Table 5. An example conclusion is given in Table 6.

### The abstract

The function of an abstract is to provide an overview of the paper. The abstract should be brief—between 100 and 250 words. The abstract should be neither vague and general nor fussily detailed; it should pull out the highlights from each section of the paper.<sup>4</sup> The structure of the abstract for a scholarly paper should include: the question or problem statement; a brief description of what was done to answer the question; the thesis statement (or answer to the question) and finally the key significance of the paper. An example abstract is given in Table 7.

### Conclusion

This paper was written with the aim of enabling new writers to confidently develop and support an argument within a scholarly paper for publication.

The similarities and differences between scientific argument and debate have been made explicit. Potential writers have been given guidance and examples of how to write a well-defined question and how to write with an acceptable tone. The elements of an effective scholarly paper have been presented and examples given.

New writers are advised to keep this paper and the earlier 'basics' paper with them as they begin, and work through, the writing process. With careful attention to following the guidelines given here many wasted hours will be avoided. An

acceptance letter will be your reward for care and diligence in preparing your paper for publication.

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