在研究论文中如何整理不同部分的内容

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年轻科学家很快都会熟悉研究论文的各个标准部分，也就是摘要、 介绍、 方法、 结果、 讨论和结论部分。然而，即使是优秀的研究人员偶尔也会对应该把一些内容放到哪一部分感到惑，可能没有意识到我们已经写到了另一个部分，比如说从方法部分写到了结果部分。今天，我想简单地概括一下一篇研究论文的各个部分，并讨论一下那些让我们不知不觉出错的“ 陷阱 ”。

也许有人会问，“ 为什么必须要遵循这种结构呢?为什么我不能直接就开始写，想说什么说什么，然后就行了呢? ”答案很简单。第一，“ 规则 ”总是在变的。研究论文已经开始出现为作者提供他们所想要的灵活性的趋势。 就在这周，一位某期刊的编辑告诉我，有些期刊允许作者“ 以你的方式来写你的论文。 ”然而，标准是经过很长时间才建立起来的，这样读者才可以轻松地在文章中找到所需要的信息。这同样也是我们写摘要的原因：为了方便。

“ 面对众多的期刊，研究者必须要决定把他/她在图书馆的宝贵时间花在阅读什么上。 ”这是1972 年我最喜欢的教授告诉我们的，“ 通常，我会先看摘要，然后直接看结论。 ”现今科学家的工作是建立在过去科学家所做的工作和方法之上的。按一种标准格式来排版研究论文能够使读者有章可循。如果是为非科学杂志而写作，作者可能会采取不同的方法，但是科学家喜欢将东西分类，这样就能够很快的在文章中找到特定的部分，节约时间。

方法部分经常会使作者出错。写方法部分时，经常会使你想把结果也写进去。你做上了实验，检查了天气或实验室的条件，一切都准备好了，那么似乎很自然地就是该直接写结果了。问题是你还没有描述完所有的方法和材料。从方法到结果是很自然的，但首先，你需要描述完所有的方法。也许你已经描述了材料和物理方法，但是还没有描述你使用的模型或统计程序。

解决办法之一是在你开始写作前，列出所有的方法。有些科学家的想法和我上高中时一样。那时我有一个天真的目标：“ 一次就写出完美文章，不需要修改 ”。作为一个编辑，现在我认识到这是几乎不可能的。写作不是数学，它没有一个正确的答案。它更像是画画。所以，在你开始之前，花点时间列出你的想法。例如，在一个典型的野外实验中，你需要包括我们以前讨论过的“ 谁

，目标，何时，哪里，如何，甚至为什么 ”。谁做的研究?在哪里做的?你用了什么，你如何使用的?为什么你的土壤测试是挖1米深而不是1.5米或0.1米?既要考虑物理方法，也要考虑精神方法，比如分析方法。唯一的限制就是不要从 “ 这是我们做的 ” 跳到 “ 这是结果 ”。

结果和讨论(或结论)之间的界限不太容易确定。它们之间的差异往往有点模糊。例如，我们可以轻松区别对土壤收集方法的描述和化学土壤测试的结果。与此相反的是，结果和讨论(结果的含义)之间的区别可能会模糊一点。例如，你的土壤测试可能表明，在灌草丛草地中，灌木从较深的土壤层吸取养分，而草本从较浅的土壤层吸取养分。你怎样区分对结果和这些结果的意义的描述?

简单地说，你得好好想想。结果是什么?草本使用浅层土壤资源。这是什么意思?他们可能与灌木苗竞争，但是无法获得超出自己根部之外的资源。将你的理由、 你的想法、
你的构思、你的意思、你的结论写到讨论和结论部分。

如果你对如何分配这些部分有疑问，你可能得先写出文章来，然后再整理出各个部分并重新排列它们。这些任务可能很乏味，类似于确保所有被引用的研究论文都在参考文献列表中，而且所有参考文献列表中的论文都被引用。然而，花时间将文章打印出来并逐段，甚至逐句查看，然后思考，“ 这是方法，结果，还是讨论? ” 还是很值得的。毕竟，我以前的想法已经被证明是错的，我很难不做任何修改就写出一首诗来。我还从未写出一篇没有经过几次修改的论文。请欣赏下面这首经过略作修订的鼓励诗吧。

方法

也许我的方法有些疯狂，但结果却显而易见，

可期刊的那些怪物，刚刚拒了我!

我花了九个月来写，还在野外做了三年。

他们拒绝打印我的论文!他们为什么不能放我一马?

他们说我把方法和结果混在了一起，

我写的时候可是顺理成章。我不能忍受这些侮辱 !

结果与结论携手并进我觉得很好，

但期刊的那些怪物把我的作品变成了沙子。

我想我应该重新审视，重新编写，重新开始，

重新思考，重新考虑，找到解决办法。

也许我不是很完美，但它看起来那么好，

可期刊的那些怪物，刚刚拒了我!

Temptations for researchers: sorting out what goes where in a research article Outline:

I: Introduction

A: Brief intro to structure B: Why research articles have structure II: Body

A: Overview B: Methods vs results C: Results vs discussion III: Conclusions

Young scientists quickly become familiar with the standard parts of a research paper, the abstract, introduction, methods, results, discussion, and conclusion sections. However, the best of us occasionally feel the temptation to move from one section to another without realizing we ’ ve made the transition from perhaps methods to results. Today, I ’ d like to provide a brief overview of a standard research paper and discuss the pitfalls we sometimes fall into, unwillfully and unwittingly.

One might ask, “ Why do what have to live with this structure? Why can ’ t I simply start writing, say what I want to say, and be done with it? ” The answers to those questions are quite simple. First, “ the rules ” are always changing. Research papers have started a trend toward providing authors with the flexibility you might desire; journals are, as one journal editor told me this week, allowing authors to “ write your paper in your way. ” However, the standards have been developed over time so that a reader can easily find the message within a paper, for much the same reason we write abstracts: convenience.

“ With so many journals, a researcher needs to pick and choose where he [or she] might spend precious time in the library, ” my favorite professor told us in 1972. “ Usually, I ’ ll start with the abstract and then go straight to the conclusions. ” Scientists of today built on the work and methods of scientists in the past. Formatting a research paper in a standard way gives the reader an idea of what to expect. A writer for a non-scientific magazine might take a very different approach, but scientists like to classify things and know where to find specific parts of a paper quickly to save time.

The methods section often trips people up. The temptation when writing your methods section is to move on to the results within the methods section. You set up your experiment, checked the weather or lab conditions, had everything ready to run, and it seems very natural to move straight to the results. The problem is that you have not finished describing your methods and the materials you used. It is natural to move from methods to results, but first you will need to finish describing all the methods. Perhaps you have described the materials and physical methods but failed to include a description of the model or statistical programs you used.

One solution might be to make a list of your methods before you start writing. Some scientists feel like I did as a high school student; I had the naive goal of, “ writing it perfectly the first time and never having to revise what I write. ” As an editor, I realize now that rarely, if ever, works. Writing is not math; there ’ s not one right answer. It is more like painting. So, take the time to outline your thoughts before you start. For example, in a typical field experiment, you ’ ll include the “ who, what, when, where, how, and even why ” that we discussed in an earlier article. Who did the research and where was it done? What did you use and how did you use it? Why did you dig 1 meter deep for your soil tests and not 1.5 meters or 0.1 meters? Try to think of both the physical and the mental methods, such as analysis methods. The only restriction is to not that that leap from, “ Here ’ s what we did, ” to “ and here ’ s the results. ”

A finer line can be drawn between results and the discussion and/or conclusions. In this case, the differences tend to blur a little. For example, one can easily see that descriptions of soil collection methods are easily distinguished from the results of the chemical soil tests. In contrast, the results and the discussion (the meaning of the results) may tend to blur a little more. For example, your soil tests may have shown that shrubs used nutrients from deeper soil layers and grasses relied on the more shallow layers in a shrubby grassland. How do you differentiate between describing the results and the meaning of those results?

To put it simply, you have to think about it. What are the results? The grasses used shallow soil resources. What does that mean? They might compete with seedlings of shrubs but cannot gain access to resources that lie beyond the extent of their roots. Move your reasons, your ideas, your thoughts, your meanings, and your conclusions to the discussion and/or conclusion section.

If you have problems with sorting these out, you may have to write your paper first and then sort out the parts and rearrange them. These sorts of tasks may seem tedious, similar to making sure all the research papers you cited are in your list of references, and vice versa. However, it may be worth your time to print out a copy of your paper, and review your paper paragraph by paragraph, or even sentence by sentence, and think, “ Is this methods, results, or discussion? ” After all, I ’ ve been proven wrong in that I can rarely write a poem without any revisions. I have yet to write a research paper that didn ’ t see several versions. Enjoy the slightly revised encouragement below.

Methods

There ’ s a madness to my method, the results are plain to see,but those monsters at the journal, have just rejected me!

I spent nine months on this baby, and three years in the field.They refuse to print my paper! Why can ’ t they simply yield?They told me that my methods were mixed with my results.

It made sense when I wrote it. I can ’ t stand all these insults!The results and the conclusion seemed to go well hand in hand,but those monsters at the journal made my writing turn to sand.I guess I should revisit, rewrite, and then rewind,rethink and reconsider, and my solution find.Perhaps I ’ m not quite perfect, it looked so good you see,but those monsters at the journal, have just rejected me!