The overall structure of the paper

Relevant body of theory/literature

Specific questions

Data collection

Data analysis

Data interpretation

Implications for theory/the field

Introduction

Materials & Methods

Results

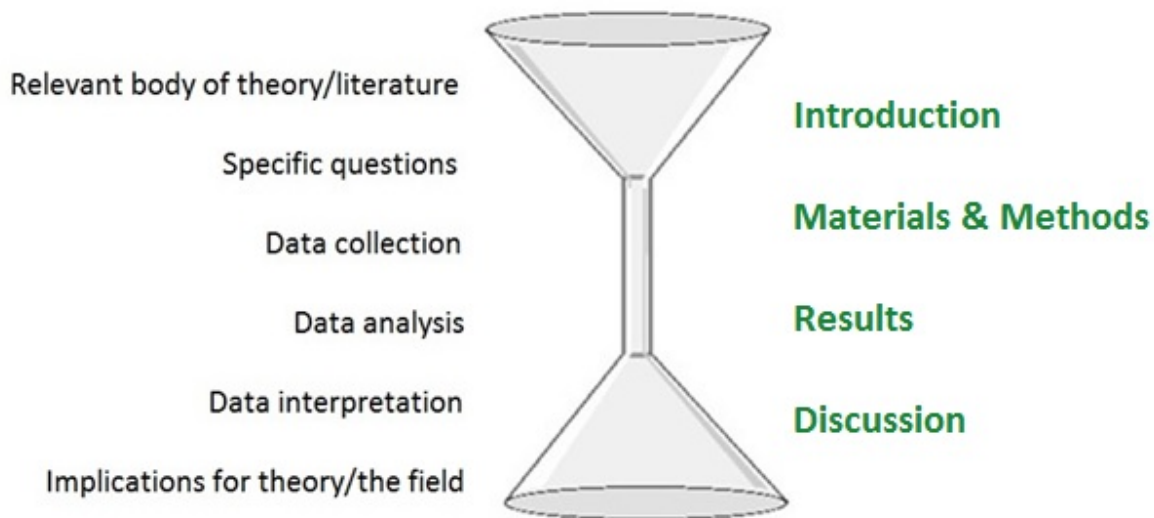**Discussion**

It can be useful to think of a scientific paper as following a two-funnel structure (or with a bit of imagination, a martini glass!), as shown above. The introduction starts by establishing the general context for your work, and then zooms in on your specific questions. The discussion expands out from your results, working out how they contribute to the wider picture, and pointing the way to new questions.

Writing paragraphs

Work out a list of topics or points to be dealt with in a given section of the paper. In the Materials and Methods section, for example, each point will probably be a different aspect of your methods. In the Discussion section, most paragraphs will deal with one of the implications of your results.

Usually, each point corresponds to one paragraph. Some complex points might need separate paragraphs developing different sub-topics, but the important thing to remember is not to change topic in the middle of a paragraph. The task of working out paragraphs can be at its most challenging in the Introduction, as nowhere else in the paper is the order of your paragraphs more important than here. As mentioned above, the golden rule when writing the introduction is that it should flow smoothly from the general to the specific. So the opening paragraph should present the general context you have chosen for your work, and the final paragraph will usually present your specific questions or aims.

Topic sentences

Having prepared your list of points, now write a *topic sentence* that presents each point. The topic sentence signals clearly to readers what the paragraph is about, and should be simple, general and succinct. If you dive straight into the specifics of an argument before signalling the general idea, it's hard for the reader to work out where the paragraph is going. So leave the details of your argument or evidence for the *supporting sentences* that follow. As we shall see below, the nature of your topic sentences will tend to vary from section to section.

Topic sentences in the Introduction

In the introduction, topic sentences will often take the form of a generalization about the existing literature. The evidence supporting the generalization is explored in the supporting sentences. Here are a couple of fictitious examples:

- "The Cape Floristic Region is universally recognized as a biodiversity hotspot"

- "Despite the widespread appearance of the ….. hypothesis in textbooks, recent empirical testing has yielded mixed results".

Topic sentences in Materials and Methods

General statements about the approach, or methods, or study conditions are appropriate topic sentences in this section. The details of the method or study conditions are given in the supporting sentences. More fictitious examples:

- "Material was obtained from 27 sites representing the range of environments occupied by *H. glaucus.*"

- "We used a likelihood ratio test to test the hypothesis that foliar freezing tolerance did not differ among the six species."

Topic sentences in Results

In this section, summarize broad patterns in the data in your topic sentences, before exploring the details in the supporting sentences. For example:

- "Cluster analysis separated South American and New Zealand species of ….. into two distinct groups."

- "The relationships of most root traits with growth with did not differ significantly between lowland and montane species."

Topic sentences in the Discussion

Most topic sentences in this section should present, in general terms, an interpretation of one aspect of your data, or state one of the implications of your study. Don't open paragraphs in the Discussion with generalizations drawn from the literature, which you've already done in the Introduction: here your job is to answer the questions posed in the Introduction, and show how your work has moved the field forward. Another mistake to avoid is restating your results *verbatim* in the Discussion—instead, allude to the patterns you've found, *en route* to their interpretation. Examples of the typical wording of effective topic sentences in the Discussion:

- "The finding of hybrids at all of our study sites is not consistent with the hypothesis that hybridisation is largely confined to disturbed habitats."

- "Our results confirm the importance of summer temperatures and N:P ratio as drivers of cyanobacterial blooms."

- "The low predictive power of most environmental variables may reflect the region's history of Quaternary glaciation, and the poor dispersal ability of *A. araucana*."