Summary and examples: Topic/key sentence, paragraph shapes

THE TOPIC SENTENCE (first sentence)

The first sentence introduces the subject of the paragraph: the topic. The paragraph answers a question about the topic. For example:

Topic: Various mechanisms as causes of the spread of happiness.
Question: What are possible mechanisms?

> *Our data do not allow us to identify the actual causal mechanisms of the spread of happiness, but various mechanisms are possible.* Happy people might share their good fortune (for example, by being pragmatically helpful or financially generous to others), or change their behaviour towards others (for example, by being nicer or less hostile), or merely exude an emotion that is genuinely contagious (albeit over a longer time frame than previous psychological work has indicated). Psychoneuroimmunological mechanisms are also conceivable, whereby being surrounded by happy individuals has beneficial biological effects.

THE KEY SENTENCE (the point); PYRAMID, FUNNEL, BOOKCASE

The key sentence expresses <u>the main message</u> of the paragraph (if there is just one). Some paragraphs sum up information and have no single main message: they are shaped like a book case.

If the key sentence is also the topic sentence, the paragraph is shaped like a **pyramid**. If the key sentence is the final (concluding) sentence of the paragraph, the paragraph is a **funnel.**

1. **Pyramid**

> It is too easy to conclude that successful replication means that the theoretical understanding of the original finding is correct. Direct replication mainly provides evidence for the reliability of a result. If there are alternative explanations for the original finding, those alternatives could likewise account for the replication. Understanding is achieved through multiple, diverse investigations that provide converging support for a theoretical interpretation and rule out alternative explanations.

Topic: The meaning of successful replication.
Question: What does successful replication mean? And: Why is it not so that…. ?

2. **Funnel**

> Direct replication mainly provides evidence for the reliability of a result. If there are alternative explanations for the original finding, those alternatives could likewise account for the replication. Understanding is achieved through multiple, diverse investigations that provide converging support for a theoretical interpretation and rule out alternative explanations. It follows that it is too easy to conclude that successful replication means that the theoretical understanding of the original finding is correct.

Topic: The meaning of direct replication.
Question: What does succesful replication mean? and Why is it not so that?

3. Book case

There are three different theories put forward for the very slow relaxation of catch muscles of molluscs. One theory holds that catch is due to some unusual property of myosin in these muscles that produces a small rate of detachment. In this theory, paramyosin would have no special role beyond that of providing the long scaffolding on which the myosin is positioned as well as the mechanical strength for the large tensions developed. The second theory holds that tension is developed by actin-myosin interaction but is maintained by paramyosin interactions. Because the thick filaments are of limited length, interaction would have to occur through fusion of thick filaments. A third theory, to which I subscribe, pictures a structural change in the paramyosin core affecting the rate of breaking of myosin-actin links at the filament structure.

Topic: Three different theories for the very slow relaxation of catch muscles of molluscs.
Question: What are they?

RED = TOPIC SENTENCE (on top of paragraph, presents topic, theme, question of paragraph)

GREEN = POINT OR KEY SENTENCE (can be anywhere, but readers love to find it at the closing of the paragraph: the key message of paragraph, or the point it is making)

BLUE = ALL IN ONE SENTENCE: always on top, presents topic + point; readers like this too

1. First sentence contains topic, and announces two elements which follow immediately.

Using exactly the same simulation results and scenario as W&H, **we present two reasons why publishing everything is more effective than selective publishing**. The first reason is that **the meta-analytic effect is estimated more precisely** (i.e., with a lower standard error) in the publishing everything than in the selective publishing approach. Second, **publishing everything is also "cheaper"** than selective publishing in terms of cost-benefit and time considerations.

2. Both the first and the last sentences contain the key message (point) of the paragraph. First sentence also offers information on substance and structure of the paragraph. This structure is more like a diamond. The final sentence may take the argument a step further, which makes it a nice shape for your discussion section.

To illustrate the higher precision of the meta-analytic effect in publishing everything, we ran exactly the same simulation as W&H but now recorded the sampling error of the estimate after 40 publications for each of the 5,000 simulations. We applied random-effects meta-analysis, because…... We used the R package metafor…. Figure 1 shows….. Figure 1 mimics… Note that …..It can be shown that ……The average standard error in …..Note that …..**To conclude, the estimate of population effect size is more precise under publishing everything than under selective publishing.**

3. The sentence containing the key message comes third, after a topic sentence as a start. The contradiction that was built in gives the point more power.

Another relevant question **concerns the validity of the selective publishing scenario**. It surely has some merit, since it explains the Proteus phenomenon that has occurred in some research areas [1], [22]. We argue, however, **that in many research fields studies are most likely to be published when they report effects that are significantly different from zero rather than from the effect estimated in cumulative meta-analysis.** The evidence for this type of publication bias is overwhelming. For instance, Fanelli [2], [3] observed a high percentage of 'positive' (significant) results in many sciences, particularly in social sciences, e.g. psychology (about 95%, [3], p. 898). This high percentage cannot be explained by studies' statistical power since power generally is low and there is no evidence that it has grown over the years ([3], p. 899). The high percentage is indicative of publication bias, i.e., the bias introduced by tendencies to mostly submit and publish results that are statistically different from zero.

4. Pyramid: first sentence holds both topic and key message.

Neither our nor W&H's simulations take into account what we consider major sources of bias in science, namely researcher's own aspirations and expectations in conducting studies, analyzing the data, and reporting of the results. The colloquial notion of "disappointing results" renders actual science notably more complex. Researchers conduct studies with a clear expectation about the results and are not immune to confirmation bias. Moreover, most high-impact journals specifically select for novel results and are commonly believed to select studies predominantly on the basis of statistical significance [32]. The incentives associated with publishing novel and statistically significant research in high-impact journals may lead to strategic behaviors of researchers [33]. Researchers' bias and strategic behavior together with journals' preference for specific results produces published studies that typically overestimate effect size and are likely not a good representation of all conducted studies.

5. Funnel. The first sentence only opens the paragraph by setting the stage. The paragraph then carries on towards a concluding sentence with the key message.

The bias introduced by the contemporary scientific publishing system is quite severe [13], [16], [34], [35] and it is clear that we as scientists need to focus more on getting it right than on getting it published [36]. In research, there are many unknown factors that are hard to comprehend on the basis of only a literature that contains results that deviate significantly from the null hypothesis or from any other hypothesis. This does not mean that using all information is necessarily the most efficient. Publishing results is costly, but setting up and executing studies on the basis of (potentially biased or inaccurate) results in the literature also comes at a major cost that may be much larger than the cost of publishing. What is clearly needed is to lower the bar for publishing replication studies [4], [35], [36]. **Although W&H proposed an interesting approach, we argue on the basis of the current results and our philosophical view that rigorous scientific data should never be wasted, and that the preferred approach to publishing is to have all information out there.**

Text fragments were taken from: Marcel A. L. M. van Assen, Robbie C. M. van Aert e.a.: Why Publishing Everything Is More Effective than Selective Publishing of Statistically Significant Results – PLOS one - Published: January 17, 2014