Revising to emphasize important points

Key points:

- State the main idea
- State the main idea simply and directly
- Emphasize key points
    - Tag them with their purpose
    - Repeat them
    - Place them where the reader expects them
        - Most important idea of paragraph at beginning or end of paragraph
        - Most important idea of section at beginning or end of section
- Structure main idea sentences to emphasize the important part
    - Important part at end
    - Important part in main clause

State the main idea

Any piece of writing (or section of that piece) has a few key ideas that hold the whole thing together. For example, a background and significance section's key ideas are the reason the proposed research is necessary and the observations that led you to propose it. Even if a reader understands all the supporting material and has the expertise to see how they would lead to the overall message, she will grasp and remember that message better if she can recognize it. Conversely, if a reader has difficulty with the evidence and explanations, he will at least see what the document says if he can identify the message. Consider this example—try to identify the main idea.

Example 1 version 1: main idea implied

The study of persistent genes in biological networks and persistent functions in computer operating system call graphs offers insight into the evolution of hierarchies. Conserved genes form the core machinery of life, the so-called paleome (23). They usually are workhorse genes that perform vital tasks; in fact, most persistent genes are enzymes. The enrichment of persistent genes at the bottom of the regulatory hierarchy in E. coli is in accordance with the view that orthologous proteins are rather similar in function whereas regulatory changes are the main driving forces of evolution (9). Persistent functions in the Linux call graph are usually "controllers." This difference suggests that not only do software networks possess more regulators than workhorses, the regulators are maintained on purpose.

Modified from Yan KK et al., "Comparing evolution in genomes and computer operating systems," *PNAS* May 2010.

The first sentence says that the paragraph will provide insight into evolution of hierarchies—it states the topic of the paragraph, not the point. From that sentence, it seems like the point then should be the difference between biological and software evolution, and the authors do mention a difference in the last sentence, but identifying

how the two processes contrast with one another requires some digging and analyzing. The message is much easier to grasp when it's stated:

Example 1 version 2: main idea stated

The study of persistent genes in biological networks and persistent functions in call graphs offers insight into the evolution of hierarchies. Persistent genes form the core machinery of life, the so-called paleome (23). They usually are not regulators but workhorse genes that perform vital tasks. In fact, most persistent genes are enzymes. The enrichment of persistent genes at the bottom of the regulatory hierarchy in E. coli is in accordance with the view that orthologous proteins are rather similar in function whereas regulatory changes are the main driving forces of evolution (9). To a certain extent, biological evolution is building from the bottom to the top. In contrast, persistent functions in the Linux call graph are usually not bottom-level workhorses but "controllers." This difference suggests that not only do software networks possess more regulators than workhorses, the regulators are maintained on purpose and thus the evolution goes from top to bottom.

This might seem self-evident, but scientific writers appear to have difficulty with it, since many papers omit key elements like the question the research addresses. Therefore, it's important to check your draft to see whether it states the main ideas. If you're not sure, have someone else read the draft and ask which one or two sentences he or she thinks comprise the main idea. Another reason to consider the main ideas of each section and paragraph after you've composed the detailed part of the document is that it's often easier to determine what they are at that point than before you know how everything will be said. Since the overall idea and the key supporting points are more apparent at the revising stage, even if you did state it in an early draft, you might realize that that statement doesn't match the content of the whole document or section. This possibility that the writing process might have altered your understanding of the point of the piece means that evaluating the statement of the overall message is important even if you planned in advance and carefully composed the draft.

→ *Look for the main idea of each paragraph and section as you revise*

- *If it's not there, add a sentence*
- *If it's inaccurate, revise it*

State the main idea simply and directly

Stating the main ideas accurately will only help your reader understand the point of your paper or proposal if the statement is comprehensible. Consider the following example (modified from the same paper as the previous one):

Example 2 version 1: main idea garbled

We first compared the topology of the transcriptional regulatory networks of Escherichia coli and the call graph of the Linux kernel, which are both canonical systems. The existence of a hierarchical organization in transcriptional regulatory networks, from a few master transcription factors (TFs) on the top through the majority of TFs at the middle, to a set of non-TF target genes, implies the existence of a downward information flow in response to various forms of stimuli, similar to the intrinsic direction of the Linux call graph, from high-level starting

functions like "main" to many other downstream functions following the outgoing edges (Fig. 1 and Table 1).

What's the main idea of this paragraph? This is from the results section, so it can't be the first sentence, since that's what they did. However, the second sentence has so many ideas in it—that hierarchy implies downward information flow, that information flows through intermediate TFs, and that the direction of information in transcriptional networks is similar to that in Linux—that it's hard to say what's most important, not that you would feel like figuring that out after wading through a five line sentence. Usually the most important part of the sentence is in the main clause—"hierarchy implies downward information flow." But that doesn't seem that important since it's obvious that transcription factors regulate target genes. The only thing that's new here is that the two networks are similar—they're both hierarchical. This would be much easier to understand were that in its own sentence, separate from the description of how information flows through transcriptional networks and how hierarchy implies downward flow.

Example 2 version 2: main idea stated simply

We first compared the topology of the transcriptional regulatory networks of Escherichia coli and the call graph of the Linux kernel, which are both canonical systems. In transcriptional regulatory networks, in response to various forms of stimuli, information flows from a few master transcription factors (TFs) through the majority of TFs at the middle, to a set of non-TF target genes. Similarly, in a Linux call graph, commands are directed from high-level starting functions like "main" to many other downstream functions following the outgoing edges (Fig. 1 and Table 1). Thus, in both networks, information flows from top to bottom through a hierarchical structure.

From this example, we can derive some simple guidelines about how to structure sentences so that they're easily understandable—each sentence (or clause) should be about one thing, and the important idea (the action) should be in the verb. Since this is equally true of all sentences, and since so many academics have difficulty with making their verbs do the work, lesson 15 explains this in more detail. Nonetheless, even if you don't write all sentences this way, at least the main ideas should be stated as simply as possible.

→ *A main idea sentence should state one thing*
→ *A main idea sentence should be direct and simple*

Emphasize the main idea

Finally, for these statements to help the reader understand the message of the section or document, he or she must know that those statements are the main ideas. The way to help readers see that is to EMPHASIZE the main ideas, which I've done to this sentence by using all caps. Visual signals like capitalization and bolding are helpful to identify key parts of some documents, such as specific aims in a proposal or headings of subsections within a results section (which often state the result itself, which is the main idea); however, using these to indicate the main idea of every paragraph and section

would make the document look less professional and obscure the ideas' relative importance.

A more specific way to tag key statements is by indicating within the sentence why they're important (not just that they are—the word "importantly" alone doesn't help the reader understand how a piece of information advances the narrative or argument). For example, the main idea of an introduction to a paper is the question the research explained in it addresses, so readers will likely try to identify the statement of the purpose. Beginning that sentence with "we asked whether" or "raising the possibility that" followed by "to address this question" would flag the sentence as the main idea. Deciding what the key point(s) of a particular section is (are) (see the lessons on each one, or Mimi Zeiger's *Essentials of Writing Biomedical Research Papers*) would allow you to compose similar verbal tags.

→ *Tag key points by stating their purpose*

Another way to signal importance verbally is by saying important things more than once. Repetition of major ideas helps both readers who read superficially by increasing the probability that they will read the key sentences and those who read thoroughly by signaling that the major ideas are worth repeating. Nonetheless, many writers hesitate to repeat themselves since they have been told not to before, and perhaps rightfully—some forms of repetition do make a document less effective, like making the exact same point using slightly different evidence in two separate nonadjacent paragraphs, or re-stating a minor point just to take up space. The value of repetition may be easier to grasp if you consider how many times a paper states its overall message, the conclusions: in the abstract, sometimes at the end of the introduction, at the beginning of the discussion, and in the title. Stating the main idea in the exact same way four times might make the paper dull, but varying your phrasing requires caution, since using different terms might suggest to the reader that you mean something different (see "Conserving key terms"). Repeating other important elements, such as specific aims or the reasons the research is significant, also helps emphasize them and helps the reader see how more detailed material relates to the overall story.

→ *Repeat the main idea*

Part of the reason repetition signals that the thing being repeated is important is that stating it two or three times takes more space and more words than stating it once. The amount of text devoted to an idea indicates its significance because the reader assumes that a writer would proportion his or her effort to explaining and arguing for each thing according to its importance; it wouldn't make sense to spend time crafting prose and figures that aren't essential to a paper or proposal's message. Thus, using lots of text to explain an insignificant idea may confuse the reader, leading him or her to believe that it's more important than it is. Alternatively, if the reader can determine that a topic covered at great length is minor, letting the amount of text disagree will frustrate the reader and make it less likely that he or she will find the document compelling. You may have had such reading experiences in the past and either had difficulty determining what points were most central to the message or wondered why an author wrote half a

page about something that never came up again. To avoid such distractions and make clear which parts of your story are most important, try to make the amount of space for each part of your story correspond to its importance either as you plan or as you revise.

→ *Proportion the amount of space (text and figures) on a topic to its importance*

A final way to emphasize important ideas that's not so obvious as those above may be apparent if you consider your experience as a reader. Think about what you've read of this lesson so far—where do you expect the most important material to be? What parts do you remember best? If you're like most readers, you expect the most important material to be at the end, and so far, you probably best remember the beginning (something about all writing having a few key ideas) and the previous paragraph or sentence. These expectations and differences in how well things are remembered indicate that sentences at certain location within a document receive more emphasis than others: the beginning and the end. Thus, the most important material in a paragraph or section should not be buried in the middle.

→ *Place the point of a paragraph or section at its beginning or its end*

Let's use an example to illustrate the effect of position on perceived importance:

Example 2 version 1: main idea buried

From an engineering point of view, the reuse of common nodes between modules is a cost-effective way to construct a complex system. However, this reuse means that breakdown of a generic function causes problems in many modules. More importantly, modifying any module might also cause problems unless the coder also makes compensating changes in a generic function. Thus, the cost-effectiveness from the reuse of functions in Linux comes at the expense of robustness; in contrast, in transcriptional networks, cost-effectiveness is sacrificed for robustness. These networks include low overlap between modules, which tend to work independently by recruiting different sets of workhorses from the broad base of the network hierarchy. This tradeoff is one example of how the two networks' different underlying design principles are deeply connected to the interplay between the systems and their environments.

What's the main idea of this paragraph? It seems from the first sentence that it should be something about reuse of common nodes, but the second sentence changes the focus to the problems this causes. Since this rules out the first sentence as the main idea, you might expect the last sentence to state the main idea. That sentence is only about transcriptional networks, while the early part is about Linux, so that can't be the main idea either. The only sentence that concerns both systems is in the middle of the paragraph, where you would expect details leading to or supporting the overall message. This conflict between the structure of the paragraph and the ideas in the sentences makes it hard to determine the main idea; middle placement de-emphasizes the key sentence. If the sentence about cost-effectiveness vs. robustness were at the end, it would be clear that this is the point of the paragraph since that's where you expect the author to tie everything together into a conclusion.

→ *Putting the main idea in the middle of a paragraph makes it easy to miss*

Example 2 version 2: main idea in power position

Programming and biological networks are shaped by different underlying design principles, which are deeply connected to the interplay between the systems and their environments. In computer programs, the reuse of code leads to generic functions, which accounts for the high overlap between modules in the Linux call graph*. From an engineering point of view, the reuse of common nodes between modules is a cost-effective way to construct a complex system. However, this reuse means that breakdown of a generic function causes problems in many modules. More importantly, modifying any module might also cause problems unless the coder also makes compensating changes in a generic function. In contrast, biological networks show low overlap between modules, which tend to work independently by recruiting different sets of workhorses from the broad base of the network hierarchy. Thus, the cost-effectiveness from the reuse of functions in Linux comes at the expense of robustness, while in transcriptional networks, cost-effectiveness is sacrificed for robustness.

* Re-structuring the paragraph revealed the lack of parallel between the descriptions of the two systems: in the original, "overlap" was only discussed in terms of transctiptional networks. The revision therefore includes a description of that property in Linux. There's still less discussion of cost-effectiveness in transcriptional networks in this version; if we had more knowledge of the topic, we could correct that.

Structure sentences to emphasize the important part

Similarly, placement of ideas within the structure of a sentence also conveys their relative significance. Compare the way you interpret the following sentences:

nExample 3: placement of a clause within a sentence affects perceived importance

Not only do software networks possess more regulators than workhorses, the regulators are maintained on purpose.

Not only do software networks maintain their regulators on purpose, they possess more regulators than workhorses.

Software networks maintain their regulators on purpose and possess more regulators than workhorses.

What was the main idea in each sentence? If you're like most readers, it probably changed with each sentence even though the phrasing was essentially the same. The only thing that changed was sentence structure: putting the idea about regulator maintenance at the beginning made it seem less important than it did in the first sentence. However, even if it's at the beginning, making it part of the main clause makes it seem almost as important as the other information. These observations should inform the way you structure sentences stating key ideas in your writing. Whatever information is at the end of the sentence seems more important, so putting the information that is more important at the end will increase the chance your reader recognizes its importance. Information in a subordinate clause, like that introduced by "not only," seems less important than that in the main clause, so the more important part of the sentence should be in the main clause.

→ *Place important information in the main clause and/or at the end of a sentence*