

## Synthesizing Sources – the CYA strategy for ethical writing in the sciences

Why learn to synthesize sources? Because, in sciences, quoting is frowned upon. Using a direct quote brings undue attention to language when science would prefer we concentrate on ideas. One of the best guides to understanding ethical writing and avoiding plagiarism is Miguel Roig's [\*Avoiding plagiarism, self-plagiarism, and other questionable writing practices: A guide to ethical writing\*](#). Currently, Dr. Roig makes his work freely available as either an .html document or a word document that can be saved (if used for a class, please write and ask Dr. Roig's permission). In brief, Roig points out a paradox in science writing that is notoriously difficult to address:



This writing conundrum is further complicated by his other suggestion which is to build expertise before you write...this is kind of difficult to do when writing is often required long before expertise is attained! Further, there is some good evidence that writing itself encourages the development of knowledge meaning that pedagogically (from a teaching standpoint), you will need to write in order to learn what it is you are writing about.

What is a writer to do? The answer is **SYNTHESIZE SOURCES**. When you discuss the literature on a topic, you have the responsibility to read more than a single source for your information. Gone are the days of *Wikipedia* and *Encyclopedia Britannica*. You must actively integrate your sources. Why? You stand a lesser chance of committing unintentional plagiarism if you use more than one main source for your work. If 4 people have basically said the same thing, then when you say it – and cite all 4 sources – you are “proving” the publication history behind the idea and the reader is more confident that you know what you are talking about. Multiple citations are most common when providing definitions, discussions, and explanations of a topic.

### MFAQs:

- What about “common knowledge”?
  - Part I: For safety's sake, nothing that you learned after the twelfth grade counts as common knowledge. If you are just beginning to study in your field, then EVERYTHING you read for the first time is new to you. Further, because you don't have the expertise to judge whether something should be considered common knowledge in your field, you need to cite more rigorously than you will a few years from now. Keep in mind, though, that virtually every article even on a well-researched topic begins with a brief definition, even when the writer expects the readers to know what the subject is. This is part of the way that writers prove their credibility as well as mark the boundaries of their own intellectual allegiances.
  - Part II: Should you stay in research, you will find that you cite less as you gain expertise. In fact, by the time you get your PhD and move toward frequent publication, you are expected to cite “appropriately”; over-citing marks you as an amateur. But until you get your PhD and/or publish frequently enough to be widely considered an expert, you should cite abundantly.
- “I feel like I'm citing every sentence!”
  - Well, yeah, for the reasons stated above! This is particularly true of Introductions and Discussion sections in research reports, and all the parts of a Review Papers, except the conclusion. In a research report, the only original information is in the Research Question, possibly the Method, the Results, and some portion of the Discussion. In a Review paper, which

is by definition a critical synthesis of the research literature on a topic, the ONLY original contributions the author makes are 1) the critique and concluding recommendations; 2) the work of putting together all the sources; 3) the organization of information itself (a new or different perspective on a topic is one of the finest contributions a scientist can make).

### **General Tips for Synthesizing Sources**

- 1) Organize task by deciding what information you are looking for (Definitions? Arguments? Practices? Theories? Examples? Models?).
- 2) Mark similar information from each source in same manner (use the same color pen to highlight or underline; use a number system, etc.). So, mark all the information which is a definition in the same way, then all the examples, then the explanation, etc. If that is too complicated for the text, then mark information that you know is central and information that you are pretty sure is peripheral in different ways.
- 3) Make lists of information which is shared among sources
  - a. List 1: summary of info that is in all sources (probably means this is CENTRAL information)
  - b. List 2: summary of info that is in some sources (could be CENTRAL, could be PERIPHERAL)
  - c. List 3: separate lists of info that is NOT shared among sources (probably PERIPHERAL -- meaning, specific to the source you are reading, but not necessarily to your research)

4) Write your explanation incorporating the information from Lists 1, 2, and 3 -- overall, it's best to start with the information shared by all the sources, and then incorporate less shared information. Peripheral information should be included last, if at all. If what you really need to provide the reader is a solid foundation for understanding the concept, then peripheral (idiosyncratic) information is confusing. On the other hand, if you are providing an in-depth discussion of something, then idiosyncratic information has a place in the writing.

### **Using Citations Wisely: Put citations where they make the most sense**

Whichever documentation system you use, put each citation close to the information you wish to acknowledge. Do not automatically put cited material at the end of every sentence. For example, the following style...is ambiguous: "Pollination of *Linaria vulgaris* has been studied in both the field and the laboratory (Arnold, 1962; Howard, 1979)." Did Arnold do his studies in the field and Howard in the laboratory? Or Howard in the field and Arnold in the laboratory? Or both authors in both settings? Moving the first citation clarifies the situation: "Pollination of *Linaria vulgaris* has been studied in both the field (Arnold, 1962) and the laboratory (Howard, 1979)." (from McMillan, 2006, 149, *Writing Papers in the Biological Sciences*)