

Biology Term Paper

Date: September 9, 2009

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Summary

You are to write a scientific term paper about a topic related to evolution, ecology or behavior.

Goal

The goal is for you to produce a term paper that illustrates that you have researched and thought in depth about a topic in evolution, ecology or behavior. The term paper will tell me that you understand the important issues in a particular field and have identified the current cutting edge in that research.

This paper is NOT an essay. I do not want you to explain a topic to me. I want you to discuss current research on a topic. If you find yourself including extensive background material then you are not doing the paper correctly. The paper is about the research, not just about the phenomenon.

It is very likely that you have never done this kind of paper before. If you are unclear about what you are doing, ask me about it.

Most importantly, think of this as an opportunity to show me what you can do, not as something that you have to do. I want you to discover something and to share that discovery with me.

Potential Topics

I suggest you look at the following journals for inspiration:

Science, Nature, Animal Behavior, Behavioral Ecology and Sociobiology, Behavioral Ecology, Ethology, Behavior, American Naturalist

You may also find material in the journals devoted to particular organisms, e.g. Auk (birds), Copeia (fish, herps), Journal of Mammalogy (mammals), etc. If you have a specific area of interest, I can suggest particular journals that you might look in.

Source Material

Our library has some of the journals mentioned above, and I have others in my own personal collection. Your task is to find recent research.

Mechanics

You will use the **primary** literature, not secondary sources like newspapers, magazines, encyclopedias or the internet. I want you to read what the current researchers are writing, not what someone else wrote about what the researcher wrote.

A typical term paper will make use of 3 papers from the primary literature.

By the first due date, you need to provide me with a one paragraph proposal for your paper. This proposal must include your name, the title, the full and proper citation of a paper from the primary literature that you intend to use and a brief description of your proposed paper (one paragraph).

It should go without saying, but I will say it anyway, you cannot submit a term paper that you are submitting, have submitted, or will submit, for another course.

Types of Literature

In class, we will discuss the differences between the primary and secondary literature. The primary literature consists of the material published in journals (which are very distinct from magazines), written by the scientist doing the work and reviewed by scientific referees. Reviews or books (with rare exceptions) do NOT constitute the primary literature. Textbooks are NEVER primary literature. These are considered secondary literature.

Sometimes the same issue of a journal will contain items that are primary literature and others that are secondary literature. For example, the journal *Science*, the most respected journal in science, often

includes many news reports, etc. that are not primary literature, as well as substantial primary literature, in the same issue.

If you are unsure as to whether a paper is primary literature or not, ask me about it.

Format

The paper **MUST BE TYPED** -- I will not read handwritten papers under any circumstances.

The paper should be double-spaced with pages numbered. It should be printed on one-side of the page only.

This paper should be no more than, and not much less than, 6 pages (all inclusive) and should include a cover page with the title, your name, and date.

e.g.,

Sperm competition in humans: fact or myth?

by

Ron Coleman
November 20, 2009

Write clearly and precisely.

I am very unimpressed with spelling mistakes or grammatical mistakes. These kinds of mistakes can **DRAMATICALLY** affect the grading of your paper. Use a spelling checker program to check your writing and have a friend read it as well.

How to Cite Sources

The purpose of citing material in a scientific document is to properly credit the work of others. A citation shows that the thought or information just presented is not that of the author, but rather comes from someone else and that person deserves the credit (or the blame).

You do NOT cite what is regarded as general knowledge. But, and here is an important point to ponder, you shouldn't be writing much general knowledge in your paper anyway. For example if you are writing a paper on the swimming biodynamics of tuna and you find yourself writing that tuna are fast moving fish that live in the ocean, then there is no need to cite anyone for that, but equally, there is no need to write the original sentence in the first place. We all know that tuna are fast moving fish that live in the ocean. Now if you want to tell me something specific, like tuna are the fastest swimming fish, clocked at over 50 miles per hour, you need a citation because I want to know who said that and then I can check it out myself if I don't believe it.

The References section

The **References** should contain ONLY citations to published work and must be set out consistently and professionally, e.g.:

journal article:

Galen, C., J.A. Shykoff and R.C. Plowright (1986) Consequences of stigma receptivity schedules for sexual selection in flowering plants. *American Naturalist* 127: 462-476.

book chapter:

Plowright, R.C. and C.M.S. Plowright (1987) Elitism in Social Insects: A Positive Feedback Model. Pp 413-436 in: *Interindividual Behavioral Variability in Social Insects* (Ed. R.L. Jeanne), Westview Press, Boulder, Colorado.

book:

Moyle, P.B., and J.J. Cech Jr. (1988) *Fishes: An Introduction to Ichthyology (Second Edition)*. Prentice Hall, Englewood Cliffs, New Jersey.

The references should be listed in alphabetical order.

How Citations Appear in the text

The three citations listed above would appear in your text as, respectively, Galen et al. (1986), Plowright and Plowright (1987), and Moyle and Cech (1988). Note that citations to papers with more than two authors -- such as the first one above -- appear in your text as the first author followed by the words 'et al.' (Latin for "and others") but the full list of authors is given in your References section.

Unpublished work is referred to in the text either as "(A.J. Smith, unpublished data)" or "(J.G. Bloggs, personal communication)", depending on the context, but is not listed in the References.

DO NOT USE footnotes as a means to cite references. In fact, do not use footnotes at all. Most scientific journals do not allow them. Some journals use a numbering system when referring to references. DO NOT do that in this paper.

Quotations

It is almost never correct to use quotations in scientific writing. This is because in science we are interested in the ideas we get from others, not their exact words. If Jones said something interesting in 1992, then paraphrase what Jones said and give her credit. For example, the following might appear in your paper,

The bluegill sunfish exhibits a diversity of reproductive styles (Jones 1992).

You do not need to put the words in quotation marks because you are telling us that Jones wrote a paper on this topic. We now know that it was not you that first found out this exciting fact, but rather it was Jones and we know where to look to find more details.

The only time you need to use quotations in science is when the actual exact words are very important. For example, Robert Trivers wrote a very famous definition of parental investment in 1972 and this one line is quoted extensively in the literature because each and every word is very precise and important.

Long chunks of text

Imagine you are writing a term paper on sea snakes and you want to make extensive use of Roberts (1999) paper on sea snakes.

You do NOT do the following:

Roberts (1999) wrote extensively on the ecology and reproduction of sea snakes. He found that most sea snakes are livebearers (Roberts 1999). Fourteen of 26 species are striped (Roberts 1999). They are found in all tropical oceans (Roberts 1999).

You would do the following:

Roberts (1999) wrote extensively on the ecology and reproduction of sea snakes. He found that most sea snakes are livebearers. Fourteen of 26 species are striped. They are found in all tropical oceans.

There is no need to put "Roberts (1999)" everywhere because it is clear that all of this material is coming from Roberts' paper.

The bottom line when citing material is as follows: you are trying to make sure that the reader knows who said what and where the reader can go to find more information.

DO NOT QUOTE when writing in science.

Check List

At the end of this document is a checklist that must be turned in with your final term paper.

Due Dates

September 30, 11:00 am: Proposal due
November 20, 11:00 am: Final paper due

Grading

The paper will be graded out of 20 points.

Term paper Checklist – Turn this page in with your term paper

Name: _____

Overall

- ___ Is there a title page?
- ___ Are the pages numbered?
- ___ Have you read your paper carefully for spelling and grammatical mistakes?
- ___ Have you written a careful analysis of RESEARCH on a topic, not a description of a topic?

General Punctuation

- ___ Every sentence ends with a period, exclamation point or question mark.
- ___ Scientific names are written in italics.
- ___ The name of the Genus is capitalized and the specific epithet is NOT capitalized, e.g., *Lepomis macrochirus*, NOT *Lepomis Macrochirus*

Citation of Literature In the body of the paper

- ___ Have you used primary literature?
- ___ Have you put an asterisk in front of each piece of primary literature in the reference section?
- ___ Have you checked that "et al." is correctly written -- notice the "." Do not put the words "et al." in quotation marks in your paper.
- ___ Have you used "et al." when there are three or more authors?
- ___ Checked that EVERY paper cited in the body of the paper is listed in the Literature Cited section

Literature Cited section

- ___ Checked that papers with three or more authors have ALL authors listed fully (i.e., you do not use et al. in the Literature Cited section)
- ___ Checked that EVERY paper listed in the Literature Cited section is actually cited in the body of the paper
- ___ Are all authors names spelled correctly?

Note: if you check these things off and they are not true, your grade will suffer severely.

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