

## Chapter 2

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# Reading and Interpreting the Literature in Exercise Science

## Introduction

This chapter begins by discussing the importance of scientific literature in exercise science. The authors then describe the differences between scientific and nonscientific literature sources. A discussion of the main components of a scientific research article is also provided, and tips are given for reading and interpreting primary and secondary academic references. The chapter ends by describing techniques for locating references, conducting literature searches, and accessing full-text articles. Students are encouraged to practice the techniques described so that they can become intelligent consumers of the literature in exercise science.

## Chapter Objectives

After studying this chapter, students will be able to do the following:

1. Describe the differences between scientific and nonscientific literature sources.
2. Describe the seven general sections of a scientific research article.
3. List the three major types of secondary academic references.
4. Discuss how to use scientific literature to locate graduate programs in exercise science.
5. Discuss how to locate references and perform literature searches in exercise science.
6. Describe how to access the full-text version of a research article.

## Related Lab on the Companion Website

Students can access the lab for this chapter, [Applying Research to Real-Life Settings](#), at the companion website.

## Test Questions

### *Multiple Choice*

1. Which of the following is the most important reason for reading and understanding scientific literature in exercise science?

- A. It looks good on job résumés.
  - B. It helps to separate fact from fiction.
  - C. It helps students get better grades.
  - D. It reduces the amount of time that students need to spend studying.
2. What is the difference between a scientific literature source and a nonscientific literature source?
- A. Scientific literature sources undergo a peer review process, whereas nonscientific literature sources do not.
  - B. Scientific literature sources describe the results of research studies, whereas nonscientific literature sources do not.
  - C. Scientific literature sources are always published in journals, while nonscientific literature sources are usually only in magazines.
  - D. Scientific literature sources are read by more people than nonscientific literature sources.
3. What is the difference between a primary and a secondary academic reference?
- A. Primary academic references include basic and applied research articles, whereas secondary academic references include review articles and academic book or textbook chapters.
  - B. Primary academic references are always longer than secondary academic references.
  - C. Primary academic references are peer-reviewed, while secondary academic references are not.
  - D. Primary academic references always contain facts, but secondary academic references do not.
4. Which of the following are nonscientific literature sources?
- A. Book and textbook chapters
  - B. Review articles and meta-analyses
  - C. Popular magazines, newspaper articles, and most Internet websites
  - D. Research articles and technical notes

5. Which of the following is the purpose of the Abstract section of a primary academic reference?
  - A. It thoroughly describes the methods used by the authors in the study.
  - B. It presents all of the results from the study.
  - C. It provides a detailed discussion of the results from the study.
  - D. It provides a very brief overview of the purpose, methods, results, and conclusions from the study.
  
6. Which of the following is one of the functions of the Introduction section of a primary academic reference?
  - A. It provides a purpose statement for the study.
  - B. It describes the methods that were used in the study.
  - C. It provides a detailed discussion of the results from the study.
  - D. It provides a summary of the most important findings from the study.
  
7. What is one of the most important reasons why the Methods section of a primary academic reference must provide a detailed description of the design of the study and all the techniques that were used to collect the data?
  - A. Another researcher may want to replicate or slightly modify the study.
  - B. It is hard to understand the results from a research study without first knowing the methods that were used to collect the data.
  - C. The methods used in the research study must be consistent with those used in previous investigations.
  - D. The Methods section must be the same length as all of the other sections of the article.
  
8. What is one of the most important reasons why the Results section of a primary academic reference must provide a comprehensive description of the results from all of the statistical analyses that were performed?
  - A. The Results section must be the same length as all of the other sections of the article.
  - B. The primary academic reference will not get published unless the Results section is comprehensive.
  - C. The results from a research study may be used in review articles known as meta-analyses.

- D. The Results section is the only part of the research article where the author(s) presents the results from their statistical analyses.
9. Which of the following is one of the most important functions of the Discussion section of a primary academic reference?
- A. The Discussion section is a brief synopsis of the results from the study.
  - B. The Discussion section provides a basis for performing the study.
  - C. The Discussion section develops a basis for future studies.
  - D. The Discussion section describes why the study was performed.
10. What is one of the most important functions of the reference list in a primary academic reference?
- A. It shows that the author(s) of the article understands the literature in the area.
  - B. It provides all of the information that is needed for the reader to acquire the publications cited by the author(s) in the article.
  - C. It shows the names of other scientists who are conducting research in the area.
  - D. It shows that the study was not the first one conducted in the area.
11. What is one of the most important differences between exercise science textbooks and books that focus on a specialized topic in exercise science?
- A. Textbooks are usually comprehensive, whereas books on a specialized topic are not.
  - B. Textbooks are usually written for teaching purposes, while books on a specialized topic usually summarize the literature in a particular area.
  - C. Textbooks are always longer than books on a specialized topic.
  - D. Textbooks often have a different author for each chapter, whereas books on a specialized topic are usually written by only one author.
12. Which of the following is a useful, government-based website for locating scientific literature sources in exercise science?
- A. Google
  - B. Yahoo
  - C. PubMed
  - D. Wikipedia

13. Which of the following services are students encouraged to use when their university or college library does not have access to the full-text version of the article that they are trying to acquire?
- A. Interlibrary loan
  - B. PubMed
  - C. ERIC
  - D. Google

### ***True or False***

1. Due to its “scientific infancy,” current knowledge in exercise science can change rapidly and often.
2. The First Amendment of the U.S. Constitution prevents a person from publishing anything that is not true.
3. The peer review process for a scientific research article typically takes less than two weeks to complete.
4. The peer review process for a scientific research article is extensive and rigorous and demands a higher quality of literature than nonscientific, non-reviewed sources.
5. There is usually only one scientific research article for a specific topic, so it is relatively easy to draw sound conclusions regarding the literature in a particular area.
6. Secondary academic references typically summarize and/or synthesize the results of many research studies.
7. In some cases, nonscientific literature sources are subjective and opinion-based articles that have not been reviewed for credibility or content.
8. Another name for a scientific research study is an *original investigation*.
9. In many journals, the Abstract section of a scientific research article is required to be 150–250 words in length.
10. In many cases, the Abstract section of a scientific research article can be accessed free of charge from specialized Internet search engines.
11. The Introduction section of a scientific research article provides detailed information regarding the experimental design of the study and the methods that were used to collect the data.
12. The Methods section of a scientific research article is important because it helps to establish the external validity of the study.

13. The Results section of a scientific research article describes only the most interesting findings from the study.
14. The Discussion section of a scientific research article usually contains information regarding the results from previous studies that have examined similar research questions.
15. Specialized books and review articles are excellent resources for students who want to learn about specific topics in exercise science.
16. A meta-analysis is a review article that uses statistical procedures to combine the results from several studies that have addressed a similar research question.
17. The only way for students to gain access to scientific research articles in exercise science is to go to their library and find the article in stacks of large bound periodicals.
18. University libraries often purchase online subscriptions to journals so that researchers and students can gain full-text access to articles from computers on the university's campus, or even at home through proxy servers connected through the university.

### ***Matching***

1. Match the sections of a scientific research article with the order in which they appear in the article.
  1. First
  2. Second
  3. Third
  4. Fourth
  5. Fifth
  6. Sixth
  7. Seventh  
  - A. Results
  - B. Methods
  - C. Abstract
  - D. Introduction
  - E. Conclusions
  - F. References
  - G. Discussion
2. Match each literature source with its description.
  1. Textbook
  2. Narrative Review
  3. Meta-analysis

- A. Review that summarizes the results from research studies
- B. Primary purpose is to educate students in exercise science
- C. Review that uses statistics to combine the results from studies

### **Short Answer**

1. Describe the peer review process that scientific research articles must go through before they can be published.
2. Describe the differences between primary and secondary academic references.
3. Describe how scientific literature can help students locate graduate programs in exercise science.
4. Describe three different methods that students can use to gain access to the full-text version of a scientific research article.
5. List two databases that are useful for finding scientific research articles in allied-health and education-related fields.
6. Describe why articles published in nonscientific literature sources are not always completely accurate.
7. Describe the seven sections of a scientific research article, and provide a brief description of the information contained in each section.
8. Describe why scientific research is important for teaching in exercise science and how research can help to differentiate fact from fiction.

### **Suggested Student Activities**

1. Have students conduct a literature search using the word “creatine” as a keyword. Then have them narrow the search by locating only scientific research articles that examined the effects of creatine on muscular strength. Have students write a brief synopsis of the results from five scientific research articles that examined the effects of creatine on muscular strength.
2. Have students find a scientific research article on an exercise science topic of their choice and access the full-text version of the article. Then have them write a two-page description of the results from the study and how the study could be modified for future investigations.
3. Have students find a nonscientific literature source (e.g., Internet website, newspaper article, magazine article) on an exercise science topic of their choice. Then have them write a two-page paper that describes a scientific research study that could be performed to examine the issue discussed in the nonscientific literature source.

## Websites

Educational Resources Information Center (ERIC®)

<http://www.eric.ed.gov>

PsycINFO®

<http://www.apa.org/psycinfo>

PubMed

<http://www.pubmed.gov>

SPORTDiscus

EBSCOhost® <http://www.epnet.com>

SIRC© <http://www.sirc.ca>

OVID™ <http://www.ovid.com>

## Answer Key

### *Multiple Choice*

1. B
2. A
3. A
4. C
5. D
6. A
7. A
8. C
9. C
10. B
11. B
12. C
13. A

### *True or False*

1. True
2. False
3. False



4. True
5. False
6. True
7. True
8. True
9. True
10. True
11. False
12. True
13. False
14. True
15. True
16. True
17. False
18. True

***Matching***

1. 1C, 2D, 3B, 4A, 5G, 6E, 7F
2. 1B, 2A, 3C