A basic skill in the research process, which you may have already mastered, is to conduct searches through various sources. As a user—and even a producer—of research, you need to develop skills for searching various sources. An understanding of the search process can facilitate your searching. Search sources include hardbound journals, electronic journals, databases, online search engines, and metasearch engines. There are strategies that can be used to expedite and refine your search. Once you have identified what you want to search, you must decide how you will search and what sources you will use. After obtaining the search information, you must determine how you will use the information and how you will cite or reference the information you obtained. A key component of using information is the fair and accurate citation of the information. There is a discussion of appropriate methods of citation, issues of plagiarism, and ways to avoid plagiarism.

One of the first steps in using and conducting research is to access sources of information. A starting point in accessing information is to first identify what you want to search. This sounds simple, but if you do not have a clear search topic you will struggle to find usable information that meets your needs. Once you have identified a topic, or someone (an instructor) has identified one for you, you should conduct a brief initial investigation of the topic to find out how broad it is. You can do an initial search through a search engine such as Yahoo or Google and/or a database such as PsycInfo.
There will be a discussion later in the chapter giving more information about using a database like PsycInfo and various search engines. You can also go to your class textbook or various encyclopedias to select your topic. (See www.lib.umb.edu/newtutori al/module1.php.) Your initial investigation gives you information about how large the topic is and what may be some variations on the topic. Once you complete this initial search you likely will need to refine your search because it may be either too large or not quite what you wanted. Keep in mind that you want to be able to manage the information, and if your search topic is too large you may have trouble covering all the information available. After refining your topic, you want to generate key search terms. The selection of your search terms is important because it may result in the search being too large or missing your topic altogether. Various strategies have been suggested, such as organizing a search using a Boolean approach (see http://lib.ua.edu/tutorials/WebTutorial/module11/Module1-4.html and http://lib.umb.edu/newtutorial/module1_4html). A Boolean search involves the use of the following terms: and, or, and not. The use of “and” results in connecting two or more words in your search.

The result is a narrowing of your search based upon the terms used. The use of “or” expands your search because either term can be used alone. The use of “not” results in the exclusion of identified terms. You may be aware of a topic that is connected to your search that you want to eliminate, so you use “not” to narrow your search.

**Database Searches**

Once you have identified key search terms, you are ready to proceed with your search strategy. I do not suggest jumping to use search engines such as Yahoo but using a more scientifically based source such as PsycInfo and initially conducting a database search. Databases like PsycInfo are useful because they contain primarily citations of original research that typically are peer-reviewed, so the quality is good. If you go to the university’s Web site and click on “database search” you can begin the process. The databases are listed by topic and alphabetically. The major databases you would search include PsycInfo, Academic Search Premier, Expanded Academic, JSTOR, PsycArticles, PsychCritiques, Sociological Abstracts, and Biological Abstracts. Once you determine the database, you type in your search terms and the Boolean search strategy. Typically the Boolean search strategy gives you the option from a drop-down box. Depending on your initial results, you may want to either expand or restrict your search.

If you receive too many results to manage, you may want to restrict your search. If you receive too few, you may want to expand. For example, you may restrict your search by reviewing sample citations and identifying those that closely match your interests and then using the specific terms found in the citation to further focus your search. Once you find your citations in the database, you may have a choice of an article abstract or full-text options. Most often you want full-text options so you can access the full article. The full-text options may be in either PDF format or HTML format. Periodically an article is available in both PDF and HTML format. You can restrict the years of your search. You also may search by author and publication date.

**Electronic Journals**

Another format for a search is through electronic journals. If you know the journal title and the publication year, you can locate an article through your university’s electronic journals. Electronic journals are alphabetized so you can easily find your journal. Also, there is the option of abstracts or full-text articles (not your choice but the library’s and publisher’s). The electronic journals are organized by date and publication volume. Once you have an article that fits your interest and topic, you may use the references in the article to gather further journal publications that may be of interest. You may want to determine the impact of a particular topic or article/research, and you can do this through citation searching. There are several Internet databases that provide information about the number of times an article or publication is cited in a particular database. Such citations give evidence of the impact of a publication on the field—the view is that others are using the article or study information as documentation in their work. A primary source for determining the impact of a study is the Web of Science database. A search of the Web of Science database provides information about citations listed in the sciences, social sciences, and arts and humanities.

**Search Engines**

Before I discuss how to conduct a search through a search engine, I want to review how to evaluate the source in regard to quality. The information on the Internet (aside from that found in electronic professional journals) may or may not be accurate. There is no systematic evaluation of information posted on a Web site. Consequently, you as the reader
must determine whether the information posted is credible. Guidelines for evaluating Web-based information include a determination of accuracy, authority, objectivity, and currency (see www.lib.ua.edu/tutorials/WebTutorial/module7/Module7-2.html and www.lib.umb.edu/tutorials/EvaluateInfo/GuidelinesEvalInfo.pdf). The first question is whether the information is accurate and is factual. What is the source of the information? Are there any citations of objective data presented, such as refereed journal publications? (Refereed publications are defined as those publications whose documents are evaluated by experts, and their review is an anonymous review.) Another question is whether the information presented is peer-reviewed and sources are documented. A second criterion for evaluating the source of information concerns authority and whether there is an author identified and what his or her credentials are. Does the author have an expertise and background on the topic addressed on the Web site? A third criterion is a determination of objectivity of the source. Is there any bias expressed in the information provided, or is the site affiliated with a group (e.g., a political group) that has a specific agenda? (See www.lib.umb.edu/tutorials/EvaluateInfo/GuidelinesEvalInfo.pdf.) The fourth criterion to consider when evaluating a Web site is the currency or recentness of the information. Materials several years old may not have current information, and the information may not be accurate as a consequence. (See www.lib.ua.edu/tutorials/WebTutorial/module7/Module7-2.html and www.lib.umb.edu/tutorials/EvaluateInfo/GuidelinesEvalInfo.pdf.) The last question concerns relevancy and addresses the appropriateness of the material for your topic (see www.lib.ua.edu/tutorials/WebTutorial/module7/Module7-2.html).

Once you have completed a search through traditional formal methods such as databases and electronic journals, you may want to expand your search and use a search engine such as Yahoo, HotBot, AltaVista, AllTheWeb, or Google. You also can use a search engine when you have narrowed your search and you are looking for a specific site and specific information. You may find important information through search engines, such as government Web sites that provide information about state, national, and international statistics. Additionally, brief government reports may be available through these Web sites identified through the search engines.

Broader search engines are the metasearch engines such as Dogpile, Mamma, and Vivisimo. These search engines are designed to link to multiple single search engines, and they can provide a large base of information. These metasearches are fast and can find large amounts of information (see www.lib.ua.edu/tutorials/WebTutorial/module7/Module7-2.html). However, you need to use search terms that fit their configurations, or you may miss relevant topics in your search.

**Plagiarism**

Since the topic of this chapter addresses searching topics and the use of database citations, it is important to discuss academic honesty, or rather what is considered academic dishonesty. One type of academic dishonesty that relates to searches and citation of references is plagiarism. Plagiarism is committed when someone presents another's ideas or writings as his or her own. In essence, the plagiarist is not giving the person who actually wrote the material credit and is attempting to take credit himself or herself. An alternate form of plagiarism is called "cybercheating" and refers to taking another's work from the Web, copying it, and pasting it into your own work (see www.lib.ua.edu/tutorials/WebTutorial/module7/Module7-2.html). Marsh (2007) concluded that "Plagiarists commit acts of petty larceny, trying to steal or pass off the words or ideas of another as if they were their own" (p. 31). It is interesting that researchers have found that college students have difficulty knowing what plagiarism is (Landau, Druen, & Arcuri, 2002; Roig, 1997). Undergraduates in the Landau, et al. (2002) study could not identify acts of plagiarism in a text sample. Also, plagiarism may be unintentional and be a consequence of the person's memory of the source material (Bredart, Lampinen, & Defeldre, 2003). Bredart, et al. (2003) defined plagiarism that was unintentional and a result of not remembering that one obtained the information from another source as "cryptomnesia." Despite there being a controversy over the ability to detect or know if one is plagiarizing or whether it is a case of cryptomnesia, colleges and universities have increasingly focused on stopping such practices. (Roig & Caso, 2005).

Roig and Caso (2005) stated: “Many in academia now believe that with the advent of computers and the internet ‘copy and paste’ plagiarism has increased dramatically in recent years” (p. 485). In most instances, the discovery of plagiarism results in a negative consequence for the student that may involve lowering a course grade or dismissal from the university (Robinson-Zanaru, Pena, Cook-Morales, Pena, Afshani, & Nguyen, 2005). So it is important for students to be aware of what plagiarism is and how to avoid it. There are several ways to avoid plagiarism (Landau, et al., 2002). One way is to provide appropriate and accurate citation of the work used in
your search. It is acceptable to give a quote a source based on the accuracy of the citation. The citation should include the author, title, date of publication, and location (see www.lib.umb.edu/tutorials/EvaluateInfo/GuidelinesEvalInfo.pdf). Another approach is to use methods of reporting on an article or publication through summarizing or paraphrasing so you do not use the exact words used by others, unless you are using a quote. You still need to cite the source of your information; ideas are considered property, and giving credit for ideas is important. Practice summarizing and paraphrasing can help with reducing or stopping plagiarism, along with appropriate and accurate citation of the work. A review of a few samples of paraphrasing and direct quotes may help understand how to avoid plagiarism.

An example of a direct quote is: Olvera, Steward, Galindo, and Stephens (2007) stated: “Group (particularly familial) goals are emphasized by most Latinos; however, American culture emphasizes individual goals” (p. 225). A paraphrase of the same quotation could be: American culture generally highlights individual goals over group goals, whereas Latinos tend to highlight group goals (Olvera et al., 2007). Note that the paraphrase results in the use of different words to provide the same meaning.

Summary

Conducting a search involves first using a relatively reliable source through databases. Further searches may be done through various search engines to help focus your topic and the information you are collecting. An even broader approach to gathering information on your topic is the use of a metasearch engine, which combines the search power from single-source search engines. Once you have obtained the information, you want to be sure that you cite the source of the information accurately and give credit for information that you have accessed, in order to avoid plagiarism. The search procedures you use will determine how useful the information is, so it is important to employ systematic and effective search strategies.

Basics of Statistical Methods

To understand and systematically evaluate research, it is first imperative to have an understanding of several basic statistical methods and related terminology. Mendenhall (1983) described statistics as “an area of science concerned with the extraction of information from numerical data and its use in making inferences about a population from which data are obtained” (p. 6). Key in this definition is the statement about extracting information and making inferences about a population. Statistics is primarily focused on making inferences about the population. Before we start a detailed discussion of statistics, I want to point out that whole courses are presented on various quantitative statistical methods, such as analysis of variance and multiple regression. This chapter will consist of a discussion of (a) different measurement scales, (b) descriptive statistics, (c) inferential statistics, and (d) correlational and regression methods.

Measurement Scales

Four different measurement scales have been identified that are used in quantitative research: (a) a nominal scale, (b) an ordinal scale, (c) an interval scale, and (d) a ratio scale (see Table 3.1). Researchers generally differentiate between numerals and numbers. Numerals are defined in terms of symbols, such as letters or words (e.g., male and female), and the interval between units cannot be assumed to be equal. Nominal and ordinal scales are considered numerals. Numbers are values on which one can perform certain mathematical operations such as adding, subtracting, and so on, and the distance between units is even (e.g., the interval between 101 and 102 is the