

C H A P T E R

3

Selecting a Problem and Reviewing the Research

What You'll Learn About in This Chapter

- How to select a research problem
- Defining and sorting out idea after idea until one fits your interests
- The importance of personal experience in selecting a problem
- The steps in reviewing the literature
- Different sources of information and how to use them
- How to use journals, abstracts, and indices
- The difference between primary and secondary resources
- Using a synthesis of literature
- How scholarly journals work
- Using the Internet to complete your literature review

So here you are, in the early part of a course that focuses on research methods, and now you have to come up with a problem that you are supposed to be interested in! You are probably so anxious about learning the material contained in your professor's lectures and what is in *Exploring Research* that you barely have time to think about anything else.

But if you stop for a moment and let your mind explore some of the issues in the behavioral and social sciences that have piqued your interest, you will surely find something that you want to know more about. That is what the research process is all about—finding out more about something that is, in part, already known.

Once you select an area of interest, you are only part of the way there. Next comes the statement of this interest in the form of a research question followed by a formal hypothesis. Then it is on to reviewing the literature, a sort of fancy phrase that sounds like you will be very busy! A literature review involves library time and note taking and organizational skills, but it provides a perspective on your question that you cannot get without knowing what other work has been done as well as what new work needs to be done.

But hold on a minute! How is someone supposed to have a broad enough understanding of the field and spew forth well-formed hypotheses before the literature is reviewed and then become familiar with what is out there? As poet John Ciardi wrote, therein “lies the rub.”

The traditional philosophers and historians of science would have us believe that the sequence of events leading up to a review of what has been done before (as revealed in the literature) is as shown in Figure 3.1a. This sequence of steps is fine in theory, but as you will discover, the actual process does not go exactly in the manner shown in the figure.

The research question and research hypothesis are more an outgrowth of an interaction between the scientist's original idea and an ongoing, thorough review of the literature (good scientists are always reading!), as you can see in Figure 3.1b. This means that once you formulate a hypothesis, it is not carved in stone but can be altered to fit what the review of the literature may reflect, as well as any change in ideas you may have.

For example, you might be interested in the effects of extended after-school care programs on the socialization skills of children. That is the kernel of the idea you want to investigate. A research question might ask what the effects of after-school programs are on how well children get along with one another. In your hypothesis, you predict that children who participate in extended after-school programs will have an increased level of social skills as measured by the XYZ test of socialization.

Use the results of previous studies to fine-tune your research ideas and hypothesis.

You might consider the hypothesis to be finished at this point, but in reality your ongoing review of the literature and your changing ideas about the relationship between the variables influence the direction your research will take. For example, suppose the findings of a similar previous study prompt you to add an interesting dimension (such as single- or dual-parent families) to your study, because the addition is consistent with the intent of your study? You should not have to restrict your creative thinking or your efforts to help you understand the effects of these after-school programs just because you have already formulated an hypothesis and completed a literature review. Indeed, the reason for completing the review is to see what new directions your work might take. The literature review and the idea play off one another to help you form a relevant and conceptually sound research question and research hypothesis.

In sum, you will almost always find that your first shot at an hypothesis might need revision, given the content of the literature that you review. Remember, it is your idea that you will pursue. The way that you execute it as a research study will be determined by the way you state the research question and the way you test the research hypothesis. It is doubtful that a review of the relevant literature would not shed some light on this matter.

Idea → Research Question → Research Hypothesis → Literature Review

Figure 3.1a From idea to literature review, with the research hypothesis on the way.

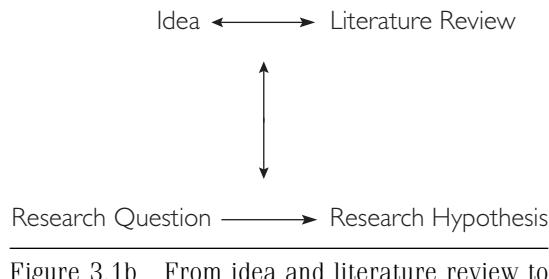


Figure 3.1b From idea and literature review to research hypothesis.

This chapter begins with some pointers on selecting a problem worth studying, and then the focus moves to a description of the tools and the steps involved in preparing a review of the literature.

Selecting a Problem

People go to undergraduate and graduate school for a variety of reasons, including preparing for a career, the potential financial advantages of higher education, and even to expand their personal horizons and experience the sheer joy of learning (what a radical thought!). Many of you are in this specific course for one or more of these reasons.

The great commonality among your course work and activities is that you are exposed to a wealth of information you would not otherwise experience. That is the primary purpose of taking the time to select a research problem that makes sense to you and that interests you, while at the same time the project can make a contribution to your specific discipline. The selection of the area you want to work on is extremely important for two reasons. First, research takes a great deal of time and energy, and you want to be sure that the area you select interests you. You will work so hard throughout this project that continuing to work on it, even if it's the most interesting project, may at times become overwhelming. Just think of what it would be like if you were not interested in the subject!

Second, the area you select is only the first step in the research process. If this goes well, the remaining steps, which are neither more nor less important, also have a good chance of going well.

Just as there are many different ways to go about selecting a research problem, there are also some potential hazards. To start you off on the right foot, the following is a brief review of some of these almost fatal errors.

It is easy to do, but *falling in love with your idea* can be fatal. This happens when you become so infatuated with an idea and the project and you invest so much energy in it that you cannot bear to change anything about it. Right away someone is going to say, "What's wrong with being enthusiastic about your project?" My response is a strong "Nothing at all." As does your professor, most researchers encourage and look for enthusiasm in students (and scientists) as an important and essential quality. But enthusiasm is not incompatible with being objective and dispassionate about the actual research process (not the content). Sometimes—and this is especially true for beginning research students—researchers see their question as one of such magnitude and importance that they fail to listen to those around them, including their adviser, who is trying to help them formulate their problem in such a way as to make it more precise and, in the long run, easier to address. Be committed to your ideas and enthusiastic about your topic but not so much that it clouds your judgment as to the practical and correct way to do things.

Next, *sticking with the first idea* that comes to mind isn't always wise. Every time the 1930s cartoon character Betty Boop had a problem, her inventor grandfather would sit

Select a problem that you are genuinely interested in.

on his stool, cross his legs (taking a Rodin-like pose), and think about a solution. Like a bolt from the blue, the light bulb above his head would go on, and Grampy would exclaim, “I’ve got it!” but the idea wouldn’t be exactly right. Another flash would occur, but once again the idea was not perfect. Invariably, it was the third time the light went on that he struck gold. Do you like your first idea for a research study? Great, but don’t run out and place an advertisement for research subjects in the paper quite yet. Wait a few days and think about it, and by no means should you stop talking to other students and your adviser during this thinking stage. Second and third ideas are usually much more refined, easier to research, and more manageable than first ones. As you work, rewrite and rethink your work . . . constantly.

Do you want to guarantee an unsuccessful project that excites no one (except perhaps yourself)? *Doing something trivial* by selecting a problem that has no conceptual basis or apparent importance in the field can lead to a frustrating experience and one that provides no closure. Beginning students who make this mistake sometimes over intellectualize the importance of their research plans and don’t take the time to ask themselves, “Where does this study fit in with all that has been done before?” Any scientific endeavor has as its highest goal the contribution of information that will help us to better understand the world in general and the specific topic being studied in particular. If you find what has been done by reading previous studies and use that information as a foundation, then you will surely come up with a research problem of significance and value.

Ah, then there are researchers who *bite off more than can be chewed*. Sound silly? Not to the thousands of advisers who sit day after day in their offices trying to convince well-intentioned beginning students that their ideas are interesting but that (for example) it may be a bit ambitious to ask all the adults in New York City about their attitudes toward increasing taxes for education. Grand schemes are fine, but unless you can reduce a question to a manageable size, you might as well forget about starting your research. If these giant studies by first-timers ever do get done (most of the time they don’t in their original form), the experiences are usually more negative than positive. Sometimes these students end up as ABDS (all but dissertation). Although you may not be seeking a doctorate right now, the lesson is still a good one. Give yourself a break from the beginning—choose a research question that is doable.

Finally, if you *do something that has already been done*, you could be wasting your time. There is a fine line between what has been done and what is important to do next based on previous work. Part of your job is to learn how to build and elaborate on the results of previous research without duplicating previous efforts. You might remember from the beginning of this chapter that I stressed how replication is an important component of the scientific process and good research. Your adviser can clearly guide you as to what is redundant (doing the same thing over without any sound rationale) and what is an important contribution (doing the same thing over but exploring an aspect of the previous research or even asking the same question, while eliminating possibly confounding sources of variance present in the first study).

Defining Your Interests

It might be easy for accomplished researchers to come up with additional ideas for research, but that is what they are paid to do (in part, anyway). Besides, experienced researchers can put all that experience to work for themselves, and one thing (a study) usually leads to another (another study).

But what about the beginning student such as yourself? Where do you get your ideas for research? Even if you have a burning desire to be an experimental psychologist, a teacher, a counselor, or a clinical social worker, where do you begin to find hints about ideas that you might want to pursue?

Be realistic and propose only what you know you can finish given all the other demands on your time and energy.

Don’t disregard personal experience as an important source of ideas.

In some relatively rare cases, students know from the beginning what they want to select as a research area and what research questions they want to ask. But most students experience more anxiety and doubt than confidence. Before you begin the all-important literature review, first take a look at the following suggestions for where you might find interesting questions that are well worth considering as research topics.

First, *personal experiences and firsthand knowledge* more often than not can be the catalyst for starting research. For example, perhaps you worked at a summer camp with disabled children and are interested in knowing more about the most effective way to teach these children. Or, through your own personal reading you have become curious about the aging process and how it affects the learning process. A further example: At least three of my colleagues are special educators because they have siblings who were not offered the special services they needed as children to reach their potential. Your own experiences shape the type of person you are. It would be a shame to ignore your past when considering the general area and content of a research question, even if you cannot see an immediate link between these experiences and possible research activities. Keep reading and you will see ways that you can create that link.

You may want to take complete responsibility for coming up with a research question. On the other hand, there is absolutely nothing wrong with consulting your adviser or some other faculty member who is working on some interesting topic and asking, "What's next?" *Using ideas from your mentor or instructor* will probably make you very current with whatever is happening in your field. Doing so also will help to establish and nurture the important relationship between you and your adviser (or some other faculty member) that is necessary for an enjoyable and successful experience. These are the people doing the research, and it would be surprising not to find that they have more ideas than time to devote to them and they would welcome an energetic and bright student (like you) who wants to help extend their research activities.

Next, you might *look for a research question that reflects the next step in the research process*. Perhaps A, B, and C have already been done, and D is next in line. For example, your special interest might be understanding the lifestyle factors that contribute to heart disease, and you already know that factors such as personality type (for example, Type A and Type B) and health habits (for example, social drinking) have been well-studied and their effects well-documented. The next logical step might be to look at factors such as work habits (including occupation and attitude) or some component of family life (such as relationships with a spouse). As with research activities in almost all disciplines and within almost all topics, there is always that next logical step that needs to be taken.

Last, but never least, is that you may have to *come up with a research question because of this class*. Now that is not all that bad either, if you look at it this way: People who come up with ideas on their own are all set and need not worry about coming up with an idea by the deadline. Those people who have trouble formulating ideas need a deadline, otherwise they would not get anything done. So although there are loftier reasons for coming up with research questions, sometimes it is just required by the powers that be. Even so, you need to work very hard at selecting a topic that you can formulate as a research question so that your interest is held throughout the duration of the activity.

Ideas, Ideas, Ideas (and What to Do With Them)

Even if you are sure of what your interest might be, sometimes it is still difficult to come up with a specific idea for a research project. For better or worse, you are really the only one who can do this for yourself, but the following is a list of possible research topics, one of which might strike a chord. For each of these topics, there is a wealth of associated literature. If one topic piques your interest, go to that body of literature (described in the second part of this chapter) and start reading.

aggression	development of drawing	mediation
AIDS	diets	memory
autism	divorce	menarche
bilingual education	dreams	mental sets
biofeedback	drug abuse	middle adulthood
biology of memory	déjà vu	motivation
birth control	early intervention	narcolepsy
body image	egocentrism	neural development
central nervous system	elder care	nightmares
child care	endocrine system	nutrition
children of war	epilepsy	optimism
circadian rhythms	ethics	pain
classical conditioning	fat	parenting
cognitive development	fetal alcohol syndrome	perception
color vision	fluid intelligence	prejudice
competition	gender differences	public policy
compliance	Head Start	racial integration
computer applications	identity	reinforcement
conflict	imagery	relaxation
creativity	intelligence	REM sleep
delusions	language development	self-esteem
depression	learning disabilities	violence in schools

From Idea to Research Question to Hypothesis

Once you have determined what your specific interest might be, you should move as quickly as possible to formulate a research question that you want to investigate and begin your review of literature.

There is a significant difference between your expressing an interest in a particular idea and the statement of a research question. Ideas are full of those products of luxurious thinking: beliefs, conceptions, suppositions, assumptions, what ifs, guesses, and more. Research questions are the articulation, best done in writing, of those ideas that at the least imply a relationship between variables. Why is it best done in writing? Because it is too easy to “get away” with spoken words. It is only when you have to write things down and live with them (spoken words seem to mysteriously vanish) that you face up to what has been said, make a commitment, and work to make sense out of the statement.

Unlike a hypothesis, a research question is not a declarative statement but rather is a clearly stated expression of interest and intent. In the pay-me-now or pay-me-later tradition, the more easily understood and clearer the research question, the easier your statement of an hypothesis and review of the literature will be. Why? Because from the beginning, a clear idea of what you want to do allows you to make much more efficient use of your time when it comes to searching for references and doing other literature review activities.

Finally, it is time to formulate an hypothesis or a set of hypotheses that reflects the research question. Remember from Chapter 2 how a set of five criteria was documented that apply to the statement of any hypothesis? To refresh your memory, here they are again. A well-written hypothesis:

1. Is stated in declarative form.
2. Posits a relationship between variables.
3. Reflects a theory or body of literature upon which it is based.

4. Is brief and to the point.
5. Is testable.

When you derive your hypothesis from the research question, you should look to these criteria as a test of whether what you are saying is easily communicated to others and easily understood. Remember, the sources for ideas can be anything from a passage that you read in a novel last night to your own unique and creative thoughts. When you get to the research question stage, however, you need to be more scientific and clearly state what your interest is and what variables will be considered.

Table 3.1 lists five research interests, the research questions that were generated from those ideas, and the final hypotheses. These hypotheses are only final in the sense that they more or less fit the five criteria for a well-written hypothesis. Your literature review and more detailed discussion may mean that variables have to be further defined and perhaps even that new ones will need to be introduced. A good hypothesis tells what you are going to do, not how you will do it.

Reviewing the Literature

Here it comes again. Today's research is built on a foundation of the hard work and dedication of past researchers and their productive efforts. Where does one find the actual results of these efforts? Look to scholarly journals and books, which are located in the library and even online.

Although all stages in the research process are important, a logical and systematic review of the literature often sets the stage for the completion of a successful research proposal and a successful study. Remember one of the fatal mistakes mentioned at the beginning of the chapter about selecting a research question that has been done before? Or one that is trivial? You find out about all these things and more when you see what has already been done and how it has been done. A complete review provides a framework

The review of literature provides a framework for the research proposal.

Research Interest or Ideas	Research Problem or Questions	Research Hypothesis
Open Classroom and Academic Success	What is the effect of open versus traditional classrooms on reading level?	Children who are taught reading in open classroom settings will read at a higher grade level than children who are taught reading in a traditional setting.
Test-Taking Skills and Grades	Will students who know how to "take" a test improve their scores?	Students who receive training in the "Here Today, Gone Tomorrow" method will score higher on the SAT than students who do not receive such training.
Television and Consumer Behavior	How does watching television commercials affect the buying behavior of adolescents?	Adolescent boys buy more of the products advertised on television than do adolescent girls.
Drug Abuse and Child Abuse	Is drug abuse related to child abuse?	There is a positive relationship between drug abuse among adults and the physical and psychological abuse they experienced as children.
Adult Care	How have many adults adjusted to the responsibility of caring for their aged parents?	The number of children who are caring for their parents in the child's own home has increased over the past 10 years.

Table 3.1 Research ideas and questions and the hypotheses that reflect them.

within which you can answer the important question(s) that you pose. A review takes you chronologically through the development of ideas, shows how some ideas were left by the wayside because of lack of support, and how some were confirmed as being truths. An extensive and complete review of the literature gives you that important perspective to see what has been done and where you are going—crucial to a well-written, well-documented, and well-planned report.

So get out your yellow (or recyclable white) writing pads, index cards, pen or pencil, laptop computer, or PalmPilot (aren't you cool?) and let's get started. Also, don't forget your school ID card so you can check out books at the campus library.

The literature review process consists of the steps shown in Figure 3.2. You begin with as clear an idea as possible about what you want to do, either in the form of a clear and general statement about the variables you want to study or as a research hypothesis. You should end with a well-written, concise document that details the rationale for why you chose the topic you did, how it fits into what has been done before, what needs to be done in the future, and its relative importance to the discipline.

General, secondary, and primary resources are all important, but very different, parts of the literature review.

There are basically three types of sources that you will consult throughout your review of the literature (see Table 3.2). The first are **general sources**, which provide clues to the location of references of a general nature on a topic. Such sources certainly have their limitations (which you will get to in a moment), but they can be a real asset because they provide a general overview of, and introduction to, a topic. For example, let's say you are interested in the general area of sports psychology but have absolutely no idea where to turn to find more information. You could start with the recent article that appeared in the *New York Times* and find the name of the foremost sports psychologist and then go to more detailed secondary or primary sources to find more about that person's work.

The second source type are **secondary sources**. These sources are “once removed” from the actual research and are review papers, anthologies of readings, syntheses of other work in the area, textbooks, and encyclopedias.

Finally, the most important sources are **primary sources**. These are accounts of the actual research that has been done. They appear as journal articles or as other original works including abstracts. Table 3.2 summarizes the functions of general, secondary, and primary resources and provides some examples. These three different types of sources are also mentioned in Chapter 9 in the discussion of historical methods of doing research.

Before you get started, let me share my own particular bias. There is no substitute for using every resource that your library has to offer, and that means spending lots of time

Define your idea in as general terms as possible by using general sources.



Search through the secondary sources.



Search through the primary sources.



Organize your notes.



Write your proposal.

Figure 3.2 The steps in reviewing the literature. It is a formidable task, but when broken down step by step, it is well within your reach.

Information Source	What It Does	Examples
General Sources	Provides an overview of a topic and provides leads to where more information can be found.	Daily newspapers, news weeklies, popular periodicals and magazines, trade books, <i>Reader's Guide to Periodical Literature</i> , <i>New York Times Index</i>
Secondary Sources	Provides a level of information "once removed" from the original work	Books on specific subjects and reviews of research
Primary Sources	The original reports of the original work or experience.	Journals, abstracts and scholarly books, Educational Resources Information Center (ERIC), movies

Table 3.2 What different sources can do for you in your search for relevant material about an interesting research question.

turning the pages of books and journals and reading their contents. But, in many cases, there's also no substitute for exploring and using electronic resources such as online databases, the Internet, and more. You'll learn about both printed and electronic resources here, but I want you always to remember that you won't find everything you need online (and much of it is not verifiable), yet online is where the most recent material shows up. And although hard copies of journals and books may be dated, they are ultimately more reliable and a collection of such "hard" copies has a longer lifespan and is much more comprehensive than anything you can find (at least today) online.

Using General Sources

General sources of information provide two things: (1) a general introduction to areas in which you might be interested, and (2) some clues as to where you should go for the more valuable or useful (in a scientific sense, anyway) information about your topic. They are also great browsing material.

Any of the references discussed below, especially the indices of national newspapers and so on, can offer you 5, 10, or 50 articles in a specific area. In these articles, you will often find a nice introduction to the subject area and a mention of some of the people doing research and where they are located. From there, you can look through other reference materials to find out what other work that person has done or even contact that person directly.

There are loads of general sources in your college or university library as well as in your local public library. The following is a brief description of just a few of the most frequently used sources and a listing of several others you might want to consult. Remember to use general sources only to orient yourself to what is out there and to familiarize yourself with the topic.

The Reader's Guide to Periodical Literature is by far the most comprehensive available guide to general literature. It is organized by topic and is published monthly, covering hundreds of journals (such as the *New England Journal of Medicine*) and periodicals or magazines (such as *Scientific American*). Because the topics are listed alphabetically, you are sure to find reading sources on a selected topic easily and quickly. Part of a page from *The Reader's Guide* is shown in Figure 3.3. As you can see, this page

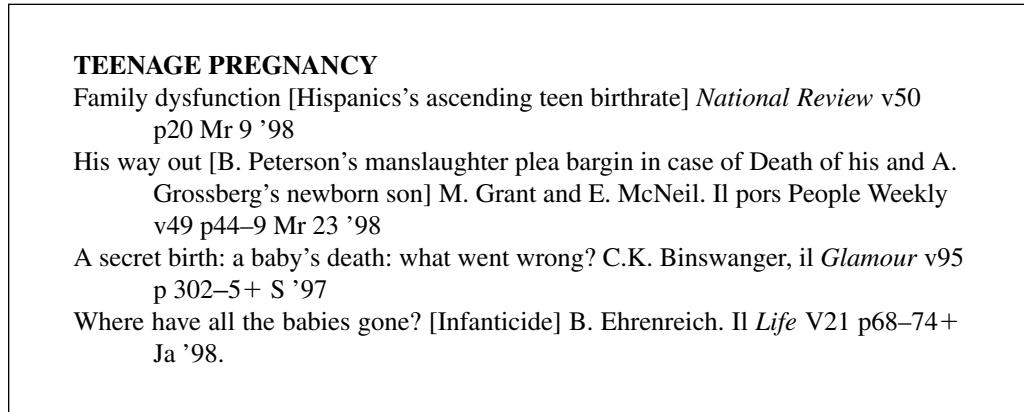


Figure 3.3 A sample entry from the *Reader's Guide to Periodical Literature*

shows available entries on the topic of teenage pregnancy. Notice that there is a general heading, Teenage Pregnancy, and underneath is a listing of specific articles by title and where they appear.

Another valuable general source is *Facts on File (FOF)*, published in New York since 1940. *FOF* summarizes news that is reported in more than 50 foreign and domestic newspapers and magazines, and is a great place to find out whether anything has appeared in these outlets in your particular area of interest. *FOF* is published weekly and its index is cumulative for the current year, so it should not take you more than a few minutes to find out if there is information available. *Facts on File* can be accessed online at <http://www.facts.com>.

The *New York Times Index* lists by subject all the articles published in the *Times* since 1851. Once you find reference to an article that might be of interest, you then go to the stacks and select a copy of the actual issue or view it on microfilm. The originals are seldom available because they are printed on thin paper that was designed to hold up for only the few days that a newspaper might be passed around.

Instead, contents are recorded on microfilm or some other medium and are available through your library. Many libraries now have microfilm readers that allow you to copy directly from the microfilm image and make a print or hard copy of what you are viewing. The full text of many newspapers is also now available electronically (discussed later in this chapter). And, although the Index is not available online, you can search through the archives of the *New York Times* online at <http://www.nytimes.com>.

Nobody should take what is printed as the absolute truth, but weekly news magazines such as *Time* (<http://www.time.com/time/>), *Newsweek* (http://www.msnbc.com/news/NW-front_Front.asp), and *U.S. News and World Report* (<http://www.usnews.com/usnews/home.htm>) offer general information and keep you well-informed about other related events as well. You may not even know that you have an interest in a particular topic (such as ethical questions in research), but a story on that topic might be in a current issue, catch your eye, and before you know it you will be using that information to seek out other sources.

There are also some specialty magazines that you might want to know about. *Science News* (published weekly and available at <http://www.sciencenews.org/>) and *Science Digest* (a monthly publication) provide summaries of important news from the world of science. They are current and informative.

Finally, there is the wealth of information you can dig out of everyday sources such as your local newspaper, company newsletters, and other publications. Local newspapers often carry the same Associated Press articles as major papers such as the *New York Times* and the *Washington Post*. And, please, do not forget the U.S. Government Printing

Office (GPO), which regularly publishes thousands of documents on everything from baseball to bees, and the majority of these documents are free. (Don't worry—your parents' tax dollars are at work.) Local and national newspapers can be found online at <http://www.newspapers.com>.

One especially useful source that you should not overlook is *The Statistical Abstract of the United States*, published yearly by the U.S. Department of Commerce (<http://www.census.gov/statab/www>). This is the national database about the United States, including valuable and easily accessible information on demographics and much more. Do you want to know more about the GPO? Write to the Government Printing Office, North Capitol and H Streets, NW, Washington, DC 20401 for a catalog of what is available or visit <http://www.gpo.gov>.

A word of caution regarding the use any of these sources via the Internet. As you can see, those that have web addresses (or URLs, universal resource locators) are available online, but many are not. Don't rely on the Internet for all of your information (because some important information is not posted there), and don't assume that all information that you find on the Internet is reliable. The Internet is a largely unregulated medium and has a long way to go until its information is as trustworthy as the peer-reviewed research article. For ideas and fun, the Internet is great. For serious research activity, use a bit of caution and common sense.

Using Secondary Sources

Secondary sources are those that you seek out if you are looking for a scholarly summary of the research that has been done in a particular area or if you are looking for further sources of references.

Reviews and Syntheses of Literature

These are the BIG books you often find in the reference section of the library (not in the stacks). Because so many people want to use them, they must always be available. The following is a summary of some of the most useful. More and more of these books are being published as encyclopedias.

A general secondary source of literature reviews is the *Annual Reviews* (published by Annual Reviews), containing about 20 chapters and focusing on a wide variety of topics such as medicine, anthropology, neuroscience, biomedical engineering, political science, psychology, public health, and sociology. Just think of it—you can go through the past 10 years of these volumes and be very up-to-date on a wide range of general topics in psychology. If you happen to find one chapter on exactly what you want to do, you are way ahead of the game. You can find out more about these volumes and see sample tables of contents at <http://www.annualreviews.org/>.

Major syntheses of information such as reviews can be a terrific foundation for your review.

Another annual review that is well worth considering is *The National Society for the Study of Education* (or NSSE) Yearbooks (also available at <http://www.press.uchicago.edu/Complete/Series/NSSE.html>). Each year since 1902, this society has published a two-volume annual that focuses on a particular topic such as adolescence, microcomputers in the classroom, gifted and talented children, or classroom management. The area of focus is usually some contemporary topic, and if you are interested in what is being covered, the information can be invaluable to you.

The Condition of Education (available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2001072>) provides a summary of important developments and trends in education. The report summarizes the most significant national measures of the condition

and progress of education, including 59 indicators in these 6 areas: (1) enrollment trends and student characteristics at all levels of the education system from preprimary education to adult learning; (2) student achievement and the longer-term, enduring effects of education; (3) student effort and rates of progress through the educational system among different population groups; (4) the quality of elementary and secondary education in terms of courses taken, teacher characteristics, and other factors; (5) the context of postsecondary education; and (6) societal support for learning, including parental and community support for learning, and public and private financial support of education at all levels. Another valuable resource is *The Encyclopedia of Educational Research*, last published in 1992, which consists of 4 volumes, including 257 articles written by experts, and stands as the standard general reference. Each of these articles contains an extensive bibliography, so it is a good place to start finding information about a particular topic. You can order a free copy online or download the files.

Are you interested in child development? Then seek out the five-volume *Handbook of Child Psychology* (Wiley, 2000) which is often used as the starting point (for ideas) by developmental and child psychology students, early childhood education students, medical and nursing students, and many others. The four individual volumes are:

- Theoretical Models of Human Development
- Child Psychology in Practice
- Cognition, Perception and Language
- Social, Emotional and Personality Development

The *Handbook of the Psychology of Aging*, by James E. Birren and K. Warner Schaie (Academic Press, 1996) deals with just about everything related to aging.

Finally, there's the eight-volume *Encyclopedia of Psychology* (Oxford University Press, 2000), which covers every aspect of this field you can imagine.

Also, do not forget the large number of scholarly books that sometimes have multiple authors and are edited by one individual or that are written entirely by one person (which, in the latter case, is sometimes considered a primary resource, depending on its content). Use the good old card catalog (or your library's computerized search system) to find the title or author you need.

Using Primary Sources

Primary sources are the meat and potatoes of the literature review. Although you will get some good ideas and a good deal of information from reading the secondary sources, you have to go to the real thing to get the specific information to support your points and to make them stick!

In fact, your best bet is to include mostly primary sources in your literature review, with some secondary sources to help make your case, and do not even think about including general sources. It is not that the information in *Redbook* or the *St. Louis Dispatch* is not useful or valuable. However, that information is second hand, and you do not want to build an argument based on someone else's interpretation of a concept.

Using Journals

Journals? You want journals? Table 3.3 lists journals arranged by category. This should be enough for you to answer your professor when he asks, "Who can tell me some of the important journals in your own field?" This list is only a small selection of what is available.

Psychology

- Adolescence
American Journal of Family Therapy
American Journal of Orthopsychiatry
American Psychologist
Behavioral Disorders
Child Development
Child Study Journal
Developmental Psychology
Contemporary Educational Psychology
Educational and Psychological Measurement
Journal of Abnormal Child Psychology
Journal of Applied Behavioral Analysis
Journal of Autism and Developmental Disorders
Journal of Child Psychology and Psychiatry and Allied Disciplines
Journal of Consulting and Clinical Psychology
Journal of Counseling Psychology
Journal of Educational Psychology
Journal of Experimental Child Psychology
Journal of Experimental Psychology: Human Perception and Performance
Journal of Experimental Psychology: Learning, Memory, and Cognition
Journal of Genetic Psychology
Journal of Humanistic Psychology
Journal of Personality and Social Psychology
Journal of Psychology
Journal of Research in Personality
Journal of School Psychology
Perceptual and Motor Skills
Psychological Bulletin
Psychological Review
Psychology in the Schools
Psychology of Women Quarterly
Small Group Behavior
Transactional Analysis Journal

Special Education and Exceptional Children

- Academic Therapy
American Annals of the Deaf
American Journal of Mental Deficiency
Behavioral Disorders
Education and Training of the Mentally Retarded
Education of the Visually Handicapped
Exceptional Children
Exceptional Education Quarterly
Exceptional Parent
Gifted Child Quarterly
Hearing and Speech Action
International Journal for the Education of the Blind
Journal for the Education of the Gifted
Journal of The Association for the Severely Handicapped
Journal of Learning Disabilities
Journal of Mental Deficiency Research
Journal of Special Education
Journal of Special Education Technology
Journal of Speech and Hearing Disorders
Journal of Speech and Hearing Research
Journal of Visual Impairment and Blindness
Learning Disability Quarterly
Mental Retardation
Sightsaving Review
Teaching Exceptional Children
Teacher Education and Special Education
Teacher of the Blind
Topics in Early Childhood Special Education
Volta Review

Health and Physical Education

- Journal of Health Education*
Journal of Alcohol and Drug Education
Journal of Leisure Research
Journal of Motor Learning
Journal of Nutrition Education
Journal of Outdoor Education
Journal of Physical Education, Recreation and Dance
Journal of School Health
Journal of Sport History
Physical Educator
Research Quarterly of the American Alliance for Health, Physical Education, Recreation and Dance
School Health Review

(continued)

Table 3.3 A sample of the thousands of journals being published in all different fields.

Guidance and Counseling

American Mental Health Counselors Association Journal	Personnel and Guidance Journal
Counselor Education and Supervision	School Counselor
Elementary School Guidance and Counseling	School Guidance Worker
Humanistic Education and Development	Vocational Guidance Quarterly

Reading, Language Arts, English

English Education	Reading Horizons
English Journal	Reading Improvement
Journal of Linguistics	Reading Psychology
Journal of Reading	Reading Research Quarterly
Journal of Reading Behavior	Reading Teacher
Journal of Research in Reading	Reading World
Language Arts	Research in the Teaching of English
Language Learning	

Education

Administrative Science Quarterly	Evaluation Review
Administrator's Notebook	High School Journal
Adult Education	Home Economics Research
Alberta Journal of Educational Research	Journal of Integrated Education
American Biology Teacher	Journal of Research in Mathematics Education
American Education	Journal of Aesthetic Education
American Educational Research Journal	Journal of Biological Education
American Journal of Education	Journal of Black Studies
American School Board Journal	Journal of Business Education
Arithmetic Teacher	Journal of Career Education
Art Education	Journal of Computer-Based Instruction
Black Scholar	Journal of Computers in Mathematics and Science
Bulletin of the National Association of Secondary School Principals	Teaching
Business Education Forum	Journal of Drug Education
Business Education World	Journal of Economics Education
Career Education	Journal of Educational Measurement
College Research Quarterly	Journal of Educational Research
Computers and Education	Journal of Educational Statistics
Educational Administration Quarterly	Journal of Experimental Education
Educational Communication and Technology: A Journal of Theory, Research, and Development	Journal of Instructional Development
Educational Evaluation and Policy Analysis	Journal of Negro Education
Educational Gerontology	Journal of Research and Development in Education
Educational Leadership	Journal of Research in Mathematics Education
Educational Record	Journal of Research in Music Education
Educational Research Quarterly	Journal of Research in Science Teaching
Educational Researcher	Journal of Social Studies Research
Elementary School Journal	Journal of Teacher Education
	Journal of Vocational Educational Research
	Library Quarterly

Table 3.3 (Continued)

Education (continued)

Library Research	School Science Review
Lifelong Learning: The Adult Years	Science and Children
Mathematics and Computer Education	Science Education
Mathematics Teacher	Science Teacher
Modern Language Journal	Secondary School Theatre Journal
Music Education Journal	Social Education
National Education Association Research Bulletin	Studies in Art Education
National Elementary Principal	Studies in Educational Evaluation
Negro Education Review	Teachers College Record
Pedoboy Journal of Education	Theory and Research in Social Education
Phi Delta Kappan	Theory Into Practice
Review of Educational Research	Today's Education
School Library Media Quarterly	Voc Ed
School Psychology Review	Young Children
School Science and Mathematics	

Sociology and Anthropology

American Anthropologist	Journal of Marriage and the Family
American Behavioral Scientist	Rural Sociology
American Journal of Sociology	Sex Roles: A Journal of Research
American Sociological Review	Social Work
Anthropology and Education Quarterly	Sociology and Social Research
Child Welfare	Sociology of Education
Family Relations	Urban Anthropology
Group and Organization Studies	Urban Education
Human Organization	Urban Review
Human Services in the Rural Environment	Youth and Society
Journal of Correctional Education	

Analytical Research

Administration and Society	Daedalus
American Historical Review	Economics of Education Review
American Political Science Review	Education and Urban Society
Annals of the American Academy of Political and Social Science	Educational Forum
Civil Liberties Law	Educational Studies
Comparative Education Review	Educational Theory
	Harvard Civil Rights

Table 3.3 (Continued)

The print version of *Ulrich's Periodicals Directory* (2000) lists thousands of periodicals, including journals, consumer magazines, and trade publications and the online version (at <http://www.ulrichsweb.com/UlrichsWeb/>) lists more than 250,000 of these sources!

Journals are by far the most important and valuable primary sources of information about a topic because they represent the most direct link between the researcher, the work of other researchers, and your own interests.

What actually is a journal, and how does it work? A journal is a collection (most often) of research articles published in a particular area by some professional group.

Get to know your library and where you can find journals related to your field of study. Most libraries offer tours on a regular basis.

For example, The American Educational Research Association publishes more than five journals, all of which deal with the general area of research in education. The American Psychological Association (APA) publishes several journals including the *Journal of Experimental Psychology* and the *Journal of Counseling Psychology*. The Society for Research in Child Development publishes *Child Development* and *Child Development Monographs*, among others. Membership in these professional groups entitles you to a subscription to the journals as part of the package, or you can subscribe separately.

Most respectable journals work something like this. First, a researcher writes an article according to a specific format (such as the one shown in Chapter 14) and then sends in a specified number of copies (usually three) required by the journal editor. Guidelines for preparing manuscripts are usually found at the front of each issue and most journals in the social and behavior sciences follow the guidelines stated in the fifth edition of the *American Psychological Association Publication Manual* (2001).

Second, once the article has been received by the editor, who is usually an acknowledged expert in that particular field, the article is sent to at least three reviewers who are also experts in the field. These reviewers participate in a process called blind review, where they do not know the author(s) of the paper. The authors' names appear only on a cover sheet that is removed by the editor, and the social security number or some other coded number is used for identification. This makes the process quite fair—there is no possibility that personalities get in the way of what can be a highly competitive goal: publishing in the best journals. Each reviewer makes a recommendation regarding suitability for publication. The options from which the reviewers can select are usually something like:

- Accept outright, meaning that the article is outstanding and can be accepted for publication as is.
- Accept with revisions, meaning that some changes need to be made by the author(s) before it is accepted.
- Reject with suggestions for revisions, meaning that the article is not acceptable as of now, but after changes are made the author(s) should be invited to resubmit it.
- Reject outright, meaning that the article is completely unacceptable.

Finally, when a consensus is reached by the reviewers, the editor of the journal conveys that decision to the author(s). If a consensus cannot be reached, the editor makes a decision or sends the article to another reviewer for additional comments. Editors work very hard to ensure that the review process and the journal publication process are fair. For journals published by associations, editors' terms usually are 4 to 6 years.

By the way, you might be interested to know that the average rejection rate for the top journals is about 80%. Yes, 80% of the articles submitted never get in, but those rejected by the top journals usually find their way into other journals. Just because these articles are not accepted by the journals with the highest rejection rate does not mean they cannot make a significant contribution to the field. In fact, several studies have shown that there is little consistency among reviewers, and what one might rank high, another might rank quite low. However, in general, it's safe to say that the better scientific reports are published by the better journals.

One more note about primary sources in general. If you know of a journal or a book that you might need and your library does not have it, do not despair. First, check other libraries within driving distance or check with some of the professors in your department. They might have it available for loan. If all else fails, use the interlibrary loan system, which your reference librarian will be glad to help you with. This service helps you locate and physically secure the reference materials you want for a limited amount of time from another library. The system usually works fast and is efficient.

And of course, an increasing number of journals are publishing the full text of their articles on the Internet, so try that before you trudge off to the library.

The peer review process of reviewing journal submissions ensures that experts review and comment on a research manuscript before it is published.

ISBN: 0-536-85933-7

Using Abstracts

If journals are the workhorses of the literature review, then collections of abstracts cannot be very far behind with regard to their convenience and usefulness. An **abstract** is a one- (or at most two-) paragraph summary of a journal article that contains all the information readers should need to decide whether to read the entire journal article.

By perusing collections of abstracts, researchers can save a significant amount of time compared with leafing through the journals from which these abstracts are drawn. Most abstracts also include subject and author indexes to help readers find what they are looking for, and abstracts of articles routinely appear in more than one abstract resource.

For example, a study on how to deal with disruptive children might appear in PsychINFO, the online version of PsychAbstracts, from a journal such as *Perceptual and Motor Skills* as well as in the *Current Index to Journals in Education* (CIJE) from a journal such as *Psychology in the Schools*. Do not be concerned if there is overlap. Actually, it means you are covering all the bases.

The following is a brief description of some abstract collections you might find useful.

The granddaddy and grandmommy of all abstracts are PsychAbstracts (at <http://www.apa.org/psycinfo/products/psycabs.html>) and PsychINFO (at <http://www.apa.org/psycinfo/about/>), which also includes book chapters. Both are published by the American Psychological Association and regularly review and abstract over 1600 journals in the following 20 different areas:

- Human experimental psychology
- Animal experimental and comparative psychology
- Physiological psychology and neuroscience
- Psychology and the humanities
- Communication systems
- Developmental psychology
- Social processes and social issues
- Social psychology
- Personality psychology
- Psychological and physical disorders
- Health and mental health treatment and prevention
- Professional psychological and health personnel issues
- Educational psychology
- Industrial and organizational psychology
- Sports psychology and leisure
- Military psychology
- Consumer psychology
- Engineering and environmental psychology
- Intelligent systems
- Forensic psychology and legal issues

There is unlimited information in PsychINFO, and the online nature enables you to search electronically. Figure 3.4 shows a sample screen from PsychINFO.

One other way to use PsychINFO is by looking up the key word bibliography. Under this heading you will find a list of bibliographies that have already been published. Maybe you will be lucky and find the one that focuses on your area of interest. Two indices that are especially useful (published by the Educational Resources Information Center or ERIC) are *Resources in Education* and *Current Index to Journals in Education* (CIJE), each of which performs a separate function.

CIJE (<http://www.oryxpress.com/cije.htm>) is not really an index but a set of abstracts from more than 750 journals focusing on the broadly defined field of education. Once again, you can expect these journal abstracts to appear elsewhere as well.

Abstracts help you save the time it would take to locate potentially important sources of information.

The screenshot shows a Microsoft Internet Explorer window titled "WebSPRS - Microsoft Internet Explorer". The search term "research methods" is entered in the search bar. The results page displays two records from the PsycINFO database:

- Record 1 of 1574 in PsycINFO Weekly 2001/11 Week 1**
 - AN: 2001-05176-009 [SEE PREVIOUS CHAPTER SEE NEXT CHAPTER](#)
 - DT: Chapter
 - TI: Grammar-based connectionist approaches to language.
 - AU: Smolensky, Paul
 - BK: Christiansen, Morten H. (Ed); Chater, Nick (Ed). (2001). Connectionist psycholinguistics. (pp. 319-347). Westport, CT, US: Ablex Publishing. viii, 390 pp. [SEE BOOK](#)
 - IB: 1567505945 (hardcover), 1567505953 (paperback)
 - PY: 2001
 - AB: (from the chapter) This chapter is addressed to basic methodological issues arising in connectionist research on language. The focus is on two main claims. The first is that there are two general styles of research that both deserve a central place in connectionist approaches to language. The first, model-based research, is well established. The second grammar-based research, is less so. Each approach, the author argues, has important strengths that are lacking in the other. The second main claim is that the time has come to stop regarding generative grammar and connectionist approaches to language as incompatible research paradigms. Each has significant potential for contributing to the other. The author suggests a view of the core theoretical commitments of the two paradigms, connectionism and generative linguistics, and argues that these commitments combine to support a coherent and fruitful research program in connectionist-grounded generative grammar. The author believes that the core commitments identified are indeed consensus beliefs of the connectionist and generative linguistics research communities. (PsycINFO Database Record (c) 2000 APA, all rights reserved)
 - [Check for holdings](#)
- Record 2 of 1574 in PsycINFO Weekly 2001/11 Week 1**
 - AN: 2001-05110-008 [SEE PREVIOUS CHAPTER SEE NEXT CHAPTER](#)
 - DT: Chapter
 - TI: Profiling Russian leaders from a psychohistorical and a psychobiographical perspective.
 - AU: Ihanus, Juhani
 - BK: Feldman, Ofer (Ed); Valenty, Linda O. (Ed). (2001). Profiling political leaders: Cross-cultural studies of personality and behavior. (pp. 129-147). Westport, CT, US: Praeger Publishers/Greenwood Publishing Group, Inc. xix, 293 pp. [SEE BOOK](#)
 - IB: 0275970361 (hardcover)
 - PY: 2001
 - AB: (from the introduction) Psychohistorical and psychobiographical perspectives are employed to provide an integrated profile of prominent Russian leaders from J. Stalin to V. Putin. This chapter begins by tracing the development of psychohistory and psychobiography as **research methods** and proceeds to describe the evolution of leadership in Russia while constructing a historical and cultural context to that evolution.

Figure 3.4 The results of a PsychINFO search.

ERIC (<http://www.ed.gov/EdRes/EdFed/ERIC.html>) is a nationwide information network that acquires, catalogs, summarizes, and provides access to education information from all sources. The database and ERIC document collections are housed in about 3000 locations worldwide, including most major public and university library systems. ERIC produces a variety of publications and provides extensive user assistance, including AskERIC, an electronic question-answering service on the Internet. The ERIC system includes 16 subject-specific clearinghouses, the ERIC Processing and Reference facility, and ACCESS ERIC, which provides introductory services and other valuable resources for any social or behavioral scientist.

As with PsychINFO, the ERIC system works with a set of descriptive terms found in a thesaurus, the Thesaurus of ERIC Descriptors, which should be your first stop. Once you find the search words or descriptors, you then use the subject index (published monthly) until you find the number of a reference that sounds like what you want. Finally, you are off to the actual description of the reference. If you want a hard copy of the entire document represented by this abstract (ERIC calls abstracts résumés), you can order either a hard copy or a microfilm copy (smaller and cheaper) through the ERIC Document Reproduction Service using forms available at your library. It usually takes about 2 weeks to receive the document. But you may not need to order a copy. If your library has a government documents department, it might already have the document on hand. Also, you might be able to contact the original author as listed in the résumé.

ERIC has been in business since 1981 and has 19 regional clearinghouses that archive, abstract, and disseminate educational articles and documents. Education is broadly defined, so many disciplines in the social and behavioral sciences are covered quite adequately. You can see how broad ERIC's reach is by examining the list of subject areas covered:

- Adult, Career, and Vocational Education (<http://ericacve.org/>) includes all levels and settings of adult and continuing, career, and vocational/technical education.

- AskERIC Virtual Library (<http://askeric.org/>) is a personalized Internet-based service providing education information to teachers, librarians, counselors, administrators, parents, and anyone interested in education throughout the United States and the world and includes collections of lesson plans, ERIC searches, mailing lists, and AskERIC Infoguides.
- Assessment and Evaluation (<http://ericae.net/>) provides information focusing on educational assessment and test use.
- Community Colleges (<http://www.gseis.ucla.edu/ERIC/eric.html>) covers development, administration, and evaluation of 2-year public and private community and junior colleges, technical institutes, and 2-year branch university campuses.
- Counseling and Student Services (<http://ericcass.uncg.edu/>) includes information on preparation, practice, and supervision of counselors at all educational levels and in all settings and theoretical development of counseling and student services.
- Disabilities and Gifted Education (<http://ericec.org/>) covers all aspects of the education and development of the disabled and gifted, including identification, assessment, intervention, and enrichment, both in special settings and in mainstreamed settings.
- Educational Management (<http://eric.uoregon.edu/>) covers all aspects of the governance, leadership, administration, and structure of public and private educational organizations at the elementary and secondary levels, including the provision of physical facilities for their operation.
- Elementary and Early Childhood Education (<http://ericeece.org/>) covers the physical, cognitive, social, educational, and cultural development of children from birth through early adolescence.
- Early Childhood Research and Practice (<http://www.ecrp.uiuc.edu/>) is an Internet journal on the development, care, and education of young children.
- Higher Education (<http://www.eriche.org/>) addresses college and university problems, programs, students, curricular and instructional programs, and institutional research.
- Information and Technology (<http://ericir.syr.edu/ithome/>) covers educational technology and library and information science at all levels.
- Languages and Linguistics (<http://www.cal.org/ericcll/>) covers languages and language sciences, including all aspects of second language instruction and learning in all commonly and uncommonly taught languages.
- National Parent Information Network (<http://npin.org/>) provides information and communications support to parents and parent support organizations.
- Reading, English, and Communication (http://www.indiana.edu/~eric_rec/) covers aspects of reading, English, and communication (verbal and nonverbal) for preschool through college levels.
- Rural Education and Small Schools (<http://wwwael.org/eric/>) covers economic, cultural, and social conditions related to educational programs and practices for rural residents; American Indians/Alaska Natives, Hispanic Americans, and migrants; educational practices and programs in all small schools; and outdoor education.
- Science, Mathematics, and Environmental Education (<http://www.ericse.org/>) covers all aspects and levels of science, mathematics, and environmental education.
- Social Studies/Social Science Education (http://www.indiana.edu/~ssdc/eric_chess.htm) monitors issues about the teaching and learning of history, geography, civics, economics, and other subjects in social studies/social sciences.
- Teaching and Teacher Education (<http://www.ericsp.org/>) covers teacher recruitment, selection, licensing, certification, training, preservice and inservice preparation, evaluation, retention, and retirement, as well as all aspects of health, physical education, recreation, and dance.
- Urban Education (<http://eric-web.tc.columbia.edu/>) includes information on programs and practices in urban area schools; education of African American and Hispanic American youth; theory and practice of educational equity; and urban and minority experiences, social institutions, and services.

342. Fagan, Jay; & Iglesias, Aquiles. (2000). **The relationship between fathers' and children's communication skills and children's behavior problems:** A study of Head Start children. *Early Education and Development*, 11, 307–320.

This study focused on the communication interaction of fathers with their Head Start children and the relationship of fathers' and children's communicative skills and child behavior problems early and late in the school year. The results indicate a relationship between children's communicative competence and social behavior. The structural models for externalizing and internalizing behavior confirm the hypothesis that father communication is linked to child communication skills and child communication is linked to behavior problems. The findings also suggest that children's communicative competence may have an ongoing direct effect on children's social behavior that transcends the impact that earlier social behavior has on later social behavior.

Figure 3.5 A sample entry from *Child Development Abstracts & Bibliography*.

Do you think that is enough to get started? PsychINFO and the ERIC sets of abstracts are major resources, but there are others that are a bit more specialized and also very useful.

Figure 3.5 shows an abstract from a recent issue of *Child Development Abstracts & Bibliography*, which ceased publication in 2001 after 75 years. You can see that it contains the complete reference for the article and a one-paragraph summary of the article's contents.

Child Development Abstracts & Bibliography abstracted more than 300 journals and provided reviews of books about children and families, including coverage in six different areas:

- Biology, health, and medicine
- Cognition, learning, and perception
- Social psychology and personality studies
- Education
- Psychiatry and clinical psychology
- History, theory, and methodology

Titles of other abstracts, such as *Sociological Abstracts*, *Exceptional Child Education Resources*, *Research Related to Children*, and *Dissertation Abstracts*, reveal the wide variety of available reference material.

Using Indices

Indices help you locate the source of important information.

Journals and abstracts provide the substance of an article, a conference presentation, or a report. If you want a quick overview of where things might be located, turn to an index, which is an alphabetical listing of entries by topic, author, or both.

A good starting point in any literature review is to look at the work of people in the same position as you are in, undergraduate or master's or doctoral students. One index is the *Comprehensive Dissertation Index*, (published by the University of Michigan), which lists dissertations for which abstracts are available.

Other similar indices are *American Doctoral Dissertations* (published by the University of Michigan) and *Master's Theses Directories* (for a variety of disciplines). Although not as current as the *Comprehensive Dissertation Index*, *American Doctoral Dissertations* lists dissertation titles by subject and year as gleaned from commencement programs.

The widely used and popular *Social Sciences Citation Index (SSCI)* and *Science Citation Index (SCI)* work in an interesting and creative way. *SCI* deals with the fields of medicine, agriculture, and technology. *SSCI* deals with the fields of social and behavioral sciences. Let's say you read an article that you find to be very relevant to your research proposal and want to know what else the author has done. You might want to search by subject through abstracts as we have talked about, but you might also want to find other articles by the same author or on the same general topic. Tools like *SSCI* allow you to focus on your specific topic and access as much of the available information as possible. For example, do you want to find out who has mentioned the classic article, "Mental and Physical Traits of a Thousand Gifted Children," written by Louis Terman and published in 1925? Look up Terman, L., in *SSCI* year by year, and you will find more references than you may know what to do with.

Finally, you can consult the *Bibliographic Index* online (<http://www.hwwilson.com/print/biblio.htm>), a compilation of bibliographies that results from a search of about 2600 periodicals. Just think of the time you can save if you locate a relatively recent bibliography on whatever you are interested in.

Reading and Evaluating Research

Almost any research activity that you participate in involves the reading of research articles that appear in journals and textbooks. In fact, one of the most common faults of beginning researchers is not being sufficiently familiar with the wealth of research reports in their specific area of interest. It is indeed rare to find a research topic where nothing (or nothing related) has been done. You may not be able to find something that exactly addresses the topic you wish to pursue (such as changes in adolescent behavior in Australian children who live in the outback), but there is plenty of information on adolescent behavior and plenty on children who live in Australia. Part of your job as a good scientist is to make the argument why these factors might be important to study. You can do that by reading and evaluating research that has been done in various disciplines on the same topic.

What Does a Research Article Look Like?

The only way to gain expertise in understanding the results of research studies is to read and practice understanding what they mean. Begin with one of the journals in your own area. Don't know of any? Then do one of two things:

- Visit your adviser or some faculty member in the area in which you are interested and ask the question, "What is the best research journal in my area?"
- Visit the library and look through the index of periodicals. You are bound to find tens if not hundreds of journals. You can find many of these online as well.

For example, for those of you interested in education and psychology and related areas, the following is a sample of 10 research journals that were rated by 700 people as those they would most like to publish in and those that they would find the most useful for reporting important research findings (Terrance & Johnson, 1978). If these 700 accomplished researchers find these journals to be valuable sources of information, wouldn't they be a great place for you to start?

- *American Educational Research Journal*
- *American Psychologist*

- *Educational Researcher*
- *Educational and Psychological Measurement*
- *Harvard Educational Review*
- *Journal of Educational Research*
- *Journal of Educational Psychology*
- *Journal of Educational Measurement*
- *Phi Delta Kappan*
- *Review of Educational Research*

Here are 10 more that focus primarily on psychology:

- *Child Development*
- *Cognition*
- *Human Development*
- *Journal of Applied Developmental Psychology*
- *Journal of Experimental Psychology*
- *Journal of Personality and Social Psychology*
- *Journal of School Psychology*
- *Perceptual and Motor Skills*
- *Psychological Bulletin*
- *Sex Roles*

And, don't forget our previous discussion of Ulrich's periodical guide (over 250,000!).

Criteria for Judging a Research Study

Judging anyone else's work is never an easy task. A good place to start might be the following checklist, which is organized to help you focus on the most important characteristics of any journal article. These eight areas can give you a good start in better understanding the general format of such a report and how well the author(s) communicated to you what was done, why it was done, how it was done, and what it all means.

1. *The Review of Previous Research.* How closely is the literature cited in the study related to previous literature? Is the review recent? Are there any seminal or outstanding references you know of that were left out?
2. *The Problem and the Purpose.* Can you understand the statement of the problem? Is the purpose of the study clearly stated? Does the purpose seem to be tied to the literature that is reviewed? Is the objective of the study clearly stated? Is there a conceptual rationale to which the hypotheses are grounded? Is there a rationale for why the study is an important one to do?
3. *The Hypothesis.* Are the research hypotheses clearly and explicitly stated? Do the hypotheses state a clear association between variables? Are the hypotheses grounded in theory or in a review and presentation of relevant literature? Are the hypotheses testable?
4. *The Method.* Are both the independent and dependent variables clearly defined? Are the definition and description of the variables complete? Is it clear how the study was conducted?
5. *The Sample.* Was the sample selected in such a way that you think it is representative of the population? Is it clear where the sample comes from and how it was selected? How similar are the participants in the study to those who have been used in similar studies?

6. *Results and Discussion.* Does the author relate the results to the review of literature? Are the results related to the hypothesis? Is the discussion of the results consistent with the actual results? Does the discussion provide closure to the initial hypothesis that the author presents?
7. *References.* Is the list of references current? Are they consistent in their format? Are the references complete? Does the list of references reflect some of the most important reference sources in the field?
8. *General Comments About the Report.* Is the report clearly written and understandable? Is the language biased? What are the strengths and weaknesses of the research? What are the primary implications of the research? What would you do to improve the research? Does the submitted manuscript conform to the editor's or publisher's specifications?

Basic Principles of Ethical Research

Although researchers should be excited and enthusiastic about their work (and publishing that work), the most important thing to remember is that human beings are serving as participants. These individuals need to be treated so that their dignity is maintained in spite of the research or the outcomes. Is this easier said than done? You bet.

The challenges that ethical behavioral research demands have created a whole field of study called ethics. As long as researchers continue to use humans and animals as participants, the way in which these people and animals are treated and how they benefit, even indirectly, from participation are critical issues that must be kept in the forefront of all our considerations.

Later in this chapter, the specific guidelines published by professional groups for their members are listed. But first, let's address the general issues that arise in any discussion of ethical behavior.

Protection From Harm

Above all, subjects (now referred to as participants) must be prevented from physical or psychological harm. If there is any doubt at the outset that there is a significant risk involved (relative to the payoffs), then the experiment should not be approved. Notice that risks and benefits are the focus. In the case of a terminally ill child, the most dramatic and even unconfirmed techniques that may save the child's life (but may also hasten the child's death) may have a high risk, but the potential benefits may be just as important to consider.

Maintenance of Privacy

Maintenance of privacy speaks to several concerns, but most directly to anonymity. Being anonymous within a research context means that there is no way that anyone except the principal investigator (usually the director) can match the results of an experiment with the participant associated with these results.

Anonymity is most often maintained through the use of a single master sheet that contains both the names of the participants and their participant number. Then, only the number is placed on scoring sheets, code sheets, or other testing materials. The list of corresponding names and numbers is kept in a secure place out of the public eye and often under lock and key.

A second concern regarding privacy is that one does not invade another's private space to observe behavior and collect data. For example, it would be unethical to secretly record the verbal interaction between therapists and their clients. Although this might be a rich source of information, it would not be legitimate unless the client and therapist agreed to it.

Coercion

People should not be forced, for whatever reason, into participation in a study. College students, especially those in introductory psychology classes, are the most commonly used population for many different research studies. Is it ethical to require these students to participate in an experiment? Probably not, yet many students must participate as a course requirement. Similarly, people in the workplace are often required to complete surveys, answer questionnaires, and provide other types of information for research purposes as a part of their job-related duties.

The key here is to never force people to participate. If they do not want to participate, then an alternative way to fulfill a course or job requirement should be provided.

Informed Consent

This may be the most important requirement, and the informed consent form might be the one tool to ensure ethical behavior. Without question, every research project that uses human participants should have an informed consent form that is read and signed by each participant or the person granting participation (in the case of a minor child with the parent signing off).

What does such a consent form look like? As you can see in Figure 3.6, these forms are not just invitations to participate (although they may be that as well) but a description of what will happen throughout the course of the research.

Such a letter contains at least the following information for participants:

- The purpose of the research
- Who you are
- What you are doing
- How long the participant will be involved
- An offer to withdraw from the experiment at any time for any reason
- Potential benefits to the individual as well as to society
- Potential harm or risks for discomfort to the individual
- An assurance that the results will be kept in strictest confidence
- How to get a copy of the results
- How you can be reached should anyone have questions

A place for the prospective subjects (or their parent) to sign indicating that they agree to participate and that they understand the purpose of the research also appears on the form.

The letter in Figure 3.6 would be printed on official (letterhead) stationery and illustrates all of these points. It is not written in scientific mumbo-jumbo, but it is as straightforward as possible. The goal here is to inform, not to coerce or cajole people into participating.



Department of Educational Psychology & Research
610 JRP Hall
Lawrence, KS 66045

November 7, 2002

Dear Mr. and Mrs. Shafer:

The Department of Educational Psychology & Research at the University of Kansas supports the practice of informed consent and protection for human subjects participating in research. The following information is provided for you to decide whether you will allow Gus to participate in the present study. You are free to withdraw his participation at any time.

Gus will be asked to play a game with a child with a disability in a room that has toys and books and your child's behavior will be recorded on videotape. One session will last approximately 25 minutes. We are interested in studying the interaction between children who have a disability and children who do not. This information is important because it will help us develop methods for increasing the effectiveness of efforts to integrate children with disabilities into the regular education classroom.

Your child's participation is solicited but is strictly voluntary. I assure you that your child's name will not in any way be associated with the research findings. The information will be identified only through a code number.

If you would like additional information concerning this study before or after it is completed, please contact me by phone or mail. Thank you very much for your time and I appreciate your interest and cooperation.

Sincerely,

Bruce Saxon, Assistant Professor
Bsaxon23@ukans.edu
(785) 555-3931

We give permission for Gus to participate in the above described research study.

Signature of Parent(s) _____ Date _____

Figure 3.6 A sample human participants consent form used at the University of Kansas.

Informed Consent With Children

There is an obvious problem when it comes to ensuring informed consent with children. An example is any investigation where the child is too young to give consent of any kind. In this case, the parents must determine whether they will allow their child to participate.

But there are issues galore when it comes to ethics and children, far beyond the difficult process of ensuring that children will not be placed in any danger, either physical or psychological. For example, are 6-year-old children old enough to make a decision about

withdrawing, as the consent form should clearly state is an option for them? Can they understand the long-range implications or the potential risks of the research in which they are participating?

This is where the good judgment and personal ethics of the researcher come into play. If a child feels strongly about not participating, you may lose that participant and those data, but the child's wishes need to be respected just as those of any adult would be. Additionally, forcing participation may result in an unhappy or angry child and, thus, untrustworthy data.

As children mature, however, the issue becomes more complex. For example, what about the 12-year-old who is old enough to understand the purpose of the experiment? Should this child sign the consent form as well as the parent(s)? No researcher in his or her right mind would not first obtain permission from the parent(s). Additionally, when school-age children are used in research, more and more school districts require that the proposal be reviewed by a school-wide research committee. More researchers than ever now have liability insurance to cover themselves if an angry parent sues or some unintended injury occurs.

The best advice is to make any experimental session or treatment with children as pleasant as possible. One way to do that is to encourage them, make the activities pleasant, and reward them when you have finished (as long as the promise of a reward does not interfere with what you are studying). But above all, remember that children are physically, emotionally, and socially different from adults, and those differences must be taken into account when they are used as subjects. And finally, get all the institution clearances you need to proceed. Make sure your adviser or professor knows what you are doing.

Confidentiality

Whereas anonymity means that records cannot be linked with names, confidentiality is maintained when anything that is learned about the participant is held in the strictest of confidence. This means that information is disguised when necessary (which touches on anonymity as well) but, more important, all the data are kept in a controlled situation.

The best way to maintain confidentiality is by minimizing the number of people who see or handle the data. There is no better example of this than recent concerns about AIDS and the results of screening tests. People are reluctant to be tested for Human Immunodeficiency Virus (HIV) (the virus associated with AIDS) because they are concerned that potential employers and insurance companies will have access to the test results and use them against the individual when he or she applies for a job or health or life insurance.

Debriefing

Another component of sharing the results of an experiment is when a particular group of subjects needs to be debriefed. For example, you design an experiment where one group of participants is asked to do something for a reason other than which they are told. You might tell young children not to play with a particularly attractive toy and then videotape their behavior without their knowledge. Once the experiment is completed, it is your responsibility to inform them that they have been deceived to some extent for the purposes of the experiment. Most people will take that just fine (as do the contestants on *Candid Camera*), but some will get upset when they learn that they have been manipulated. If they remain angry, it is difficult to do anything other than apologize and try to set the

record straight. The easiest way to debrief participants is to talk with them immediately following the session or to send a newsletter telling participants the general intent and results of the study but leaving out specifics such as names.

Sharing Benefits

This last principle may be the least often adhered to. Here is the scenario: In an experiment, a treatment was used to increase the memory of older people with early-stage Alzheimer's disease, a devastating and almost always fatal illness. Let's say that the researcher uses two groups, one that receives the treatment (the experimental group) and one that does not (the control group). Much to the researcher's pleasure, the treatment group learns faster and remembers much more for much longer. Success!

What is the concern? Simply that the group that did not receive the treatment should now be exposed to it. It is the right thing to do. When one group benefits from participation in a study, any other groups that participated in the study should benefit as well. This does not mean that it is possible that all people with the disease can be helped. That may not be feasible. But all direct participants in the experiment should benefit equally.

All these ethical issues apply to the different types of research methods described in Chapters 9 through 12, with differing degrees of importance. For example, one need not be concerned about debriefings when conducting a case study, because no treatment and no deception is involved, nor would one be concerned with sharing of benefits.

Ensuring High Ethical Standards

There are several steps that even the beginning researcher can take to ensure that ethical principles are maintained. Here are some of the most important:

1. Do a computer simulation, where data are constructed and subjected to the effects of various treatments. For example, mathematical psychologists and statisticians often use Monte Carlo studies to examine the effects of a change in one variable (such as sample size) on another (such as accuracy of measurement). Elaborate models of human behavior can be constructed and different assumptions can be tested and conclusions drawn about human behavior. Although this is somewhat advanced work, it does give you an idea of how certain experiments can be conducted with the "participants" being nothing more than values generated by a computer.
2. When the treatment is deemed harmful, do not give up. Rather, try to locate a population that has already been exposed to the harmful effects of some variable. For example, the thousands of children and pregnant women who were malnourished during World War II provided an invaluable sample for estimating the effects of malnourishment on fetal and neonatal development as well as the long-range effects of malnourishment on young children. Although it is not pleasant, this is about the only way that such research is possible. This type of research is called quasi-experimental and will be covered in greater detail in Chapter 12.
3. Always secure informed consent. If the treatment includes risk, be absolutely sure that the risks are clear to the participant and other interested parties (e.g., parents, other family members).
4. When possible, publish all reports using group data rather than individual data. This measure maintains confidentiality.

5. If you suspect that the treatment may have adverse effects, use a small, well-informed sample until you can expand the sample size and the ambitiousness of the project. Also, be sure to check with your institutional review board (more about that below).
6. Ask your colleagues to review your proposal, and especially your experimental procedures, before you begin. Ask them the question, "Would you participate without any fear of being harmed?" If they say "No," go back to the drawing board.
7. Almost every public institution (such as public universities) and every private agency (such as some hospitals and private universities) have what is called an institutional review board. Such boards consist of a group of people from several disciplines (including representatives from the community) who render a judgment as to whether participation in the experiment is free from risk. At the University of Kansas, the group is called the Human Subjects Committee; there is a separate review board for experiments using animals. The groups usually meet and then approve or disapprove the procedure (but not necessarily the content of research) and take into consideration the issues already discussed. These committees usually meet about once per month, and if a proposal that they review is not acceptable, they invite the researcher to resubmit according to their recommendations.

The Role of Professional Organizations

It is unquestionably the role of the researcher to ensure that ethical standards are always kept in mind when conducting any type of research. There are more formalized sets of guidelines published by professional organizations such as the APA, the Society for Research in Child Development (SRCD), the American Sociological Association (ASA), the American Educational Research Association (AERA), and just about every other social or behavioral science professional group. To illustrate just what these guidelines suggest, the following is a summary of those presented by the American Psychological Association (a group of about 25,000 professionals) and the Society for Research in Children Development (a group of about 6,000 professionals).

APA Ethical Guidelines

The guidelines formulated by an APA committee were first presented in 1953. Here is a summary of the latest guidelines:

1. When a study is planned, the researcher must be the first and most important judge of its ethical acceptability.
2. Participants must be judged to be "at no risk" or "at minimal risk."
3. The researcher is responsible for ensuring ethical practices, including the behavior of assistants, students, employees, collaborators, and anyone else involved in the process.
4. A fair and reasonable agreement must be reached between the researcher and the subjects prior to the beginning of the research.
5. If deception is necessary, the researcher must be sure it is justified and a mechanism must be built in to ensure that subjects are debriefed when the research is concluded.
6. Researchers must respect the subject's choice to withdraw and must not coerce the subject to return to the study.
7. Every possible effort should be made to protect participants from physical and psychological harm.

8. Once the research is complete, should the participant so indicate, the results should be shared and the participant should be given a chance to clarify any discrepancies she or he might be aware of.
9. If the research should result in harm of any kind, the researcher has the responsibility to correct the harm.
10. All the information obtained in a research study is confidential.

SRCD Ethical Guidelines

Because this is a group committed to learning more about the development of children, you will notice how precisely these guidelines are written to consider children's well-being:

1. The rights of the child supersede the rights of the investigator no matter what the age of the child.
2. All ethical issues surrounding the research project are the responsibility of the head investigator.
3. If there are changes in approved procedures that might affect the ethical conduct of the research, consultation with colleagues or experts should be undertaken.
4. The child should be fully informed as to the research process, and all questions should be answered in a way that can be understood.
5. Children are free to withdraw from the research at any time.
6. Informed consent from parents, teachers, or whoever is legally responsible for the child's welfare must be obtained in writing.
7. Informed consent must also be obtained from others who are involved in the experiment (such as parents, etc.), besides the individual child.
8. The responsibilities of the child and of the investigator must be made clear.
9. When the potential for harm is present, the investigator must either find an alternative way to collect the necessary information or abandon the research.
10. When deception is necessary, a committee of the investigator's peers should approve the planned methods.
11. All information is confidential.
12. If institutional records are to be used as a source of information, permission must be obtained from all affected parties.
13. The findings from any study should be reported to the participants in a way that is comprehensible to them.
14. Investigators should be especially careful about the way they report results to children and should not present the results in the form of advice.
15. If during the course of the investigation information arises that is important to the child's welfare, the investigator has an obligation to report the information to parents, teachers, or other appropriate parties.
16. All undesirable consequences should be corrected.
17. Investigators should be aware that research can have political, social, and human implications, and they should be mindful of this when results are reported and shared.
18. If treatments are effective, control groups should be offered similar opportunities to receive the treatment.
19. These ethical standards should be presented to students in the course of their training.
20. All investigators have the responsibility of maintaining their own ethical conduct and that of their colleagues as well.
21. Editors of journals that report investigations of children should provide authors space to summarize the steps they took to ensure these standards. If it is not clear such standards were followed, editors should request additional information.
22. These standards are always open to discussion and amendment.

Do the ethical standards of the APA and the SRCD work? In general, the answer is probably “yes,” but if they do work, it’s because of the individuals who make up the research community and follow these rules.

Using Computers in Your Search for Research

Both the computer as a tool and the library as a storehouse of information play different but equally important and complementary roles in the research process.

Imagine this if you will: You are in your apartment and it is late at night. You find that you need one more reference on the development of adolescent self-esteem to complete your literature review. You are tired. It is snowing. The library is about to close, and it might not have what you need anyway.

Zoom, you’re on the Internet and you’re on the way. Log onto some proprietary (which means you pay) database or just browse and search for the reference you need. In 20 seconds you have got the reference to read or to print. Is this for real? You bet, and since the printing of the last edition of *Exploring Research* (some staggering 3 years ago), the Internet has become a dominant force in preparing, doing and disseminating research.

Whether at home, in your office, or in the confines of the library—and now even using wireless technology at the mall or in front of the student union—the use of computers for completing literature searches and reviews is booming, and blooming with new databases to search becoming available each day.

In a moment we’ll start our explanation of some of this, but first a few words of “this can’t be true, but it is.” Many of you who are using this book may have never taken advantage of what your library services have to offer. Now, if you don’t have access to the Internet at home because you can’t afford a computer (although the price of the equipment you need is dropping dramatically), that’s entirely understandable. What is not understandable is why you are not accessing these resources on campus. All colleges and universities provide free access to all these resources for students. The personal computers you can use may be located in the computer center, in the library, in academic buildings or even in all three and more—but they are surely there for the using. It is likely that a hefty chunk of the fees that you pay each semester goes toward purchasing new equipment and paying for these services, so use them!

Also, the publishing industry is changing so rapidly that currently many important sets of references are no longer available as hard (printed) copy. For example, as you read earlier, Psych Abstracts is available as PsychINFO as well (and the print version may very well disappear in the near future) and most institutions have it available only on CD or online. Why? Basically, it’s not any more expensive than the paper copy, it’s easier to use and, best of all, it takes up virtually no space (well, maybe a bunch of CDs—but that’s lots better than a football field worth of shelves).

Searching Online

Your local city library as well as the university have access to the Internet as well as guides to the loads of information available electronically.

At the University of Kansas, students can walk into Watson Library (one of the main research libraries), sit down at a computer terminal, and access ERIC documents, and search through them in seconds for the reference they need—not bad. They can access a network connection that can lead them to millions of other abstracts, full-length articles, and more. And, on most campuses, you can now do that from a remote location such as your cozy apartment or dorm room.

University, business, and government researchers are turning to online information providers more and more to find the key information they need, whether a specific reference or fact, such as the number of bicycles produced by Japan or the number of young adults who live in urban areas.

The Value of Online Searches

Why conduct an online search if you can just as well let your fingers do the walking through the stacks, books, journals, abstracts, and indices (tired yet?) discussed earlier in this chapter?

I am sure you have guessed by now . . . basically, it boils down to time and convenience. You can do a search using one of the online services in one-quarter of the time it takes to do it manually.

Another important advantage of online searches, if your search skills are anywhere near competent, is that you are not likely to miss very much. The information providers (such as America Online) provide access to tens of thousands of documents, either in their own databases or others they can tap into. And dedicated databases have millions of pieces (such as the APA's PsychINFO) of information. And as mentioned earlier, most colleges and universities now allow access to their libraries from off campus, another good reason to become proficient in this area. At the least, you can work through a catalog of holdings online. At best, you can actually access the holdings.

Finally, and this may be the most attractive advantage, online searches are the way of the future. There is so much information out there that soon it will be close to impossible to search intelligently without the aid of a computer.

But there are some down sides to the use of online services as well, one being cost. There is no free lunch, and there is no free searching either. For example, a terrific primary source is *The New York Times Online* (www.nytimes.com). You can search and download today's issue and the previous week's for free, but if you want to go back and get an article from 3 weeks ago, you'll have to pay—not much (about \$2.95 each, less if you want to buy a 10-pack), but it's not free. On the other hand, your local paper (ours is the *Lawrence Journal World* [www.ljworld.com], see Figure 3.7) also has a very nice set of archives that

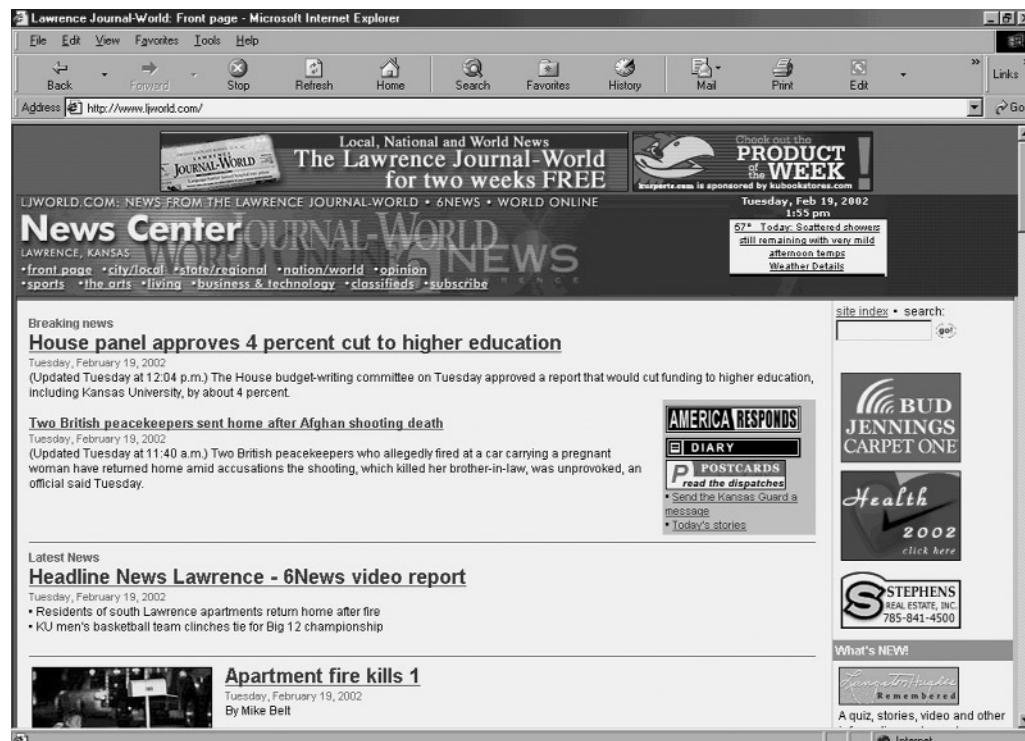


Figure 3.7 Be sure not to overlook your local paper as a source of online general sources where you can download articles. Reprinted with permission from *Lawrence Journal World*, KS, February 19, 2002.

you can search and download from, for free. Sometimes you can even reprint articles from major news services that would cost you directly, but are free when available locally!

An Introduction to the Internet and the World Wide Web

Many of you who are reading this text are very savvy when it comes to using the Internet, but there are still some of you who are not. So, the following material is a refresher for those who can always learn something new and an introduction to those who are unfamiliar with the Internet, how it works, and what it can do for a new researcher.

In the most basic of terms, the **Internet** (also commonly referred to as “the net”) is a network of networks. What is a network? A **network** is a collection of computers that are connected to one another and that can communicate with each other. Imagine all these networks being connected to one another and imagine hundreds of networks and thousands of computers of all different types attached to one another and millions of people using those computers. Now you have some idea how large the Internet is. In fact, it is growing geometrically (2, 4, 8, 16, etc.) and now millions of people connect each day for work (and a bit of fun as well).

Research Activities on the Net

If you are talking about information in all shapes and sizes, there is not much that you cannot do on the Internet. Here is a brief overview of how the Internet can be used for research purposes:

- The Internet is used most often for **electronic mail** or **e-mail**. Just as you exchange postal mail with a colleague across the United States or the world, you can do the same without ever putting pen to paper. You create a message and send it to your correspondent’s electronic address. It is fast, easy, and fun. For example, if you would like a reprint of an article that you find interesting, you could e-mail the author and ask for a copy. Almost all faculty, staff, and students at large and small educational institutions have e-mail. Or if you want further information about a particular person’s work, that person probably has a resumé available online.
- There are thousands of **electronic newsgroups** available on the Internet. These are places where information can be posted and shared among Internet users, with topics that range from space exploration to the authenticity of a Civil War era land deed. You can “drop in” and contribute to any of these newsgroups. For example, if you are interested in K-12 math curriculum, try the k12.ed.math newsgroup. How about pathological behavior? Try the sci.psychology.psychotherapy newsgroup. We mentioned these earlier and will return to them again later for a short demo.
- Finally, there is the **World Wide Web** or **WWW**. Here you can use a browser (such as Netscape or Internet Explorer) to make a connection to these graphical stops on the information highway. You can access the National Institutes of Health home page and see what types of funding programs are available or go to the latest timetable at the University of Kansas to find out when Statistics 1 class is being offered and who is teaching it.

An Introduction to E-Mail

Imagine it is 1925 and you are sitting at your desk at college, writing a letter to a friend in England. You stamp the letter, mail it, and 3 weeks later you receive an answer. You

are amazed at how fast the mail is and sit down to answer your friend's new questions about how much you like college and what you will do after you graduate.

Now imagine it is 2002 and you are writing to a friend in England, only this time you use electronic mail or e-mail. From your home, you compose the message, press the send key, and your friend has it almost instantly. Not only does your friend have it, but you copied it to three other members of the research team, including your primary professor. The reply arrives within 20 minutes and "attached" to the message is a special thank you note.

E-mail works much like conventional mail. You write a message and send it to an address. The big difference is that there is no paper involved. Rather, the messages you send travel from one computer to another in a matter of minutes or hours, rather than in days or weeks, as fast as your voice travels in a telephone conversation.

Here is a sample Microsoft Outlook (one of the most popular e-mail clients or programs) session where I write to a colleague and request a reprint. In Figure 3.8, I have composed a message to a colleague requesting a copy of an article. The Outlook screen is like many other mail program screens where you compose a letter.

- It has a location for the Internet address to whom the message is being sent (Dr. Lewis Margolis at the University of North Carolina).
- It shows the topic or subject of the message (Copy of article).
- The content of the message is shown in the main message area starting with "Dear Dr. Margolis."

Once the message is complete, I click the Send button at the top of the screen and the message is sent to Lewis Margolis.

If it was a message that I wanted to copy to other people, I can just enter those addresses as well (under Cc:), and even send a Bcc: (or a "blind carbon copy"), which means that only the person to whom the mail is Bcc'd sees it and no one else. And if I want, I can "attach" a file (such as a paper or a graphic) that I want to send as well.

Usually, when any kind of mail is sent, whether e-mail or snail mail (another term for postal mail), the recipient answers. Outlook automatically checks my mailbox every pre-set number of minutes (I decide how often) and lets me know if I have mail to read. If I do have mail, a chime sounds, and I double-click on the message and it opens.

And how should you use e-mail, which is the really big question here? Well, first, if you're not already an e-mail user, get an account from your computer center and start. It's fun for social and family reasons, but it's indispensable as part of the research process. Imagine having a question about a particular test you want to use in a research study. E-mail the test's author. Imagine not being able to find a critical reference. E-mail the

Now more than ever,
e-mail is the way to
communicate with
colleagues and others in
your field.

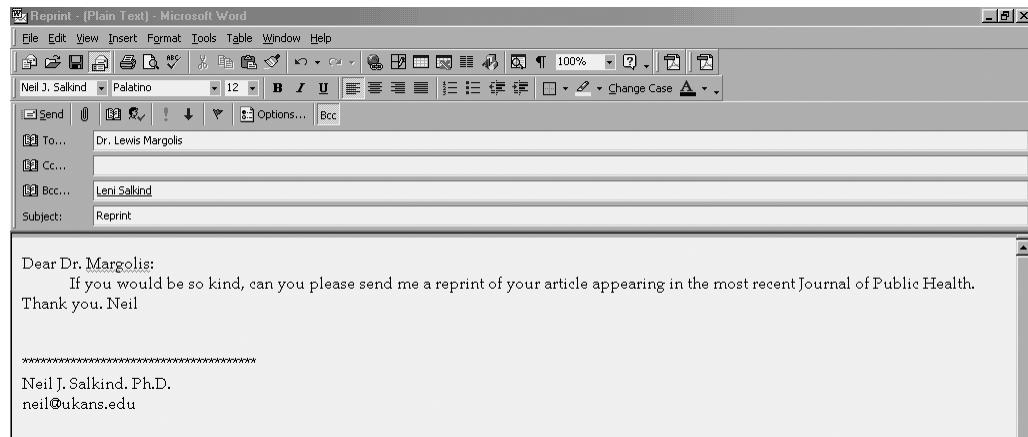


Figure 3.8 A sample Microsoft Outlook session.

author of that reference. Imagine not being able to understand a point your professor made in class about a particular statistical technique. With permission, e-mail your professor. This stuff really works.

One note about e-mail. E-mail works because there are servers to which the mail is sent and then distributed. Sometimes these servers break down and mail can be delayed, for an hour or, in some cases when perhaps they have been infected with a virus, for days. My advice is to have two e-mail addresses, one that you get from school and one of the other many free ones that are available such as those from Yahoo! (www.yahoo.com) or Hotmail (www.hotmail.com). You can always use these as a backup and receive or send mail from there. In many cases, you can even view your other mail account receipts (such as your school mail) within your Yahoo or Hotmail account.

An Introduction to Newsgroups

Now, imagine being able to find information about 30,000 topics, ranging from stereo systems to jokes (censored and otherwise) to the ethics of law to college football to astronomy. Where would you be able to find a collection of such diverse information that can be easily accessed? You guessed it—the Internet and the various newsgroup sites that ship news each day around the world. The news that fits in one category, such as college football or the ethics of law, forms a newsgroup (also called a group). A newsgroup is simply a collection of information about one topic. Surprisingly, very few students are aware of and use newsgroups.

To help manage the flow of articles, news sites are managed, moderated, administered, and censored by system administrators who work for institutions such as universities and corporations. Not all newsgroups reach each potential site or everyone who has access to an Internet site. The newsgroups from which you can select news are those that the system administrator makes available.

What's in the News?

Newsgroups are named and organized following a set of rules. The most general of these rules has to do with the name of the group itself. There is a hierarchical structure to a newsgroup name, with the highest level of the hierarchy appearing in the left-most position. For example, the newsgroup name *k12.ed.tech* means that within *k12* (the general name for the kindergarten through twelfth-grade newsgroup), there is a subset named *ed* (for education) and within that another subset named *tech* (for technology).

Table 3.4 is a sample of some newsgroup names, what these groups are named, the general area they cover, and examples of what is in each of these groups.

To see how a newsgroup works, let's follow an example of someone who is interested in educational technology. Once again, we'll use Netscape. It wasn't too long ago when you would have to use a separate news reader to read news. Now almost every browser, such as Netscape, comes with its own reader built in and ready to go. The tools allow you to read existing news and to post new messages.

The first thing you need to do when you are ready to access a newsgroup is to subscribe to it. Your e-mail program or Internet browser (such as Internet Explorer) should come with a news reader. From the list of newsgroups (as shown in Figure 3.9), you can select the ones to which you want to subscribe. Each time you start your news reader, you will get the updated version of those newsgroups, including all the news that has been added to that group since the last time you opened it.

Newsgroups can be small or huge discussions about a particular topic.

Newsgroup	General Area	Examples
Alt	Everything that doesn't fit anywhere else and certainly lots of stuff out of the ordinary.	<ul style="list-style-type: none"> Alt.actors.dustin-hoffman (welcome back to the Graduate) Alt.amazon.women (Xena, the Warrior Princess and more) Alt.anything (guess)
Comp	Information about computers, computer science, computer software, and general interest computer topics.	<ul style="list-style-type: none"> Comp.ai (Danger! Will Robinson!—all about artificial intelligence) Comp.compression (a discussion of ways to compress or reduce files) Comp.software engineering (so you want to design a new chip?)
News	Information about news, newsgroups, and the newsgroup network	<ul style="list-style-type: none"> News.admin.censorships (all about what should and shouldn't be on the net) News.admin.net-abuse.email (don't like all that junk e-mail? Come here for advice) News.announce.conferences (where to go to be seen)
Biz	Information about business	<ul style="list-style-type: none"> Biz.healthcare (health care and \$\$\$) Biz.books.technical (new publications about business) Biz.comp.accounting (the exciting world of accounting)
K12	Information about education from kindergarten through grade 12	<ul style="list-style-type: none"> K12.ed.science (teaching science from kindergarten through 12th grade) k12.library (especially for librarians) k12.lang.francais (<i>mais oui!</i>)
Bionet	Information about biology	<ul style="list-style-type: none"> Bionet.biophysics (light reading) Bionet.jobs (where to turn after you get your Ph.D.) Bionet.journals (where to publish the results of your Ph.D. dissertation)
Rec	Information about recreation, hobbies, the performing arts, and fun stuff	<ul style="list-style-type: none"> Rec.sport.swimming (make a splash) Rec.bicycles.racing (what cool stuff to buy for your bike to go faster) Rec.skydiving (take an extra 'chute)
Sci	Information about science, scientific research and discoveries, engineering, and some social science stuff	<ul style="list-style-type: none"> Sci.astro (astronomy) Sci.cognitive (so that's what you're thinking!) Sci.skeptic (UFOs do exist!)
Soc	Information about the social sciences	<ul style="list-style-type: none"> Soc.couples (people getting along) Soc.penpals (why people write to one another) Soc.misc (stuff that doesn't fit anywhere else)

Table 3.4 Some common newsgroup prefixes and examples.

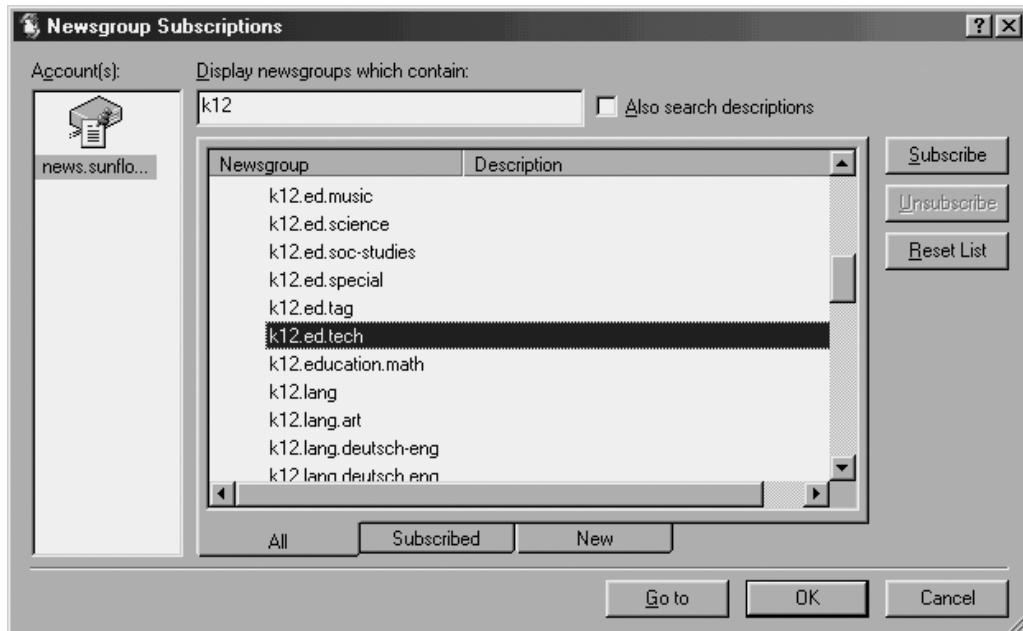


Figure 3.9 A listing of available newsgroups.

The next step would be to open the k12.ed.tech newsgroup and examine the contents, as shown in Figure 3.10. Within newsgroups, you will see a listing of topics open for discussion, each one started by an individual as a source for more information, a place to meet electronically, discuss issues, and so forth.

If someone wants to participate in a certain newsgroup, they can add a new topic at this level, or go into an existing newsgroup and make their own contribution.

Using Mailing Lists or ListServs

There is another really neat way to use the Internet, and it is a great source of information. You can sign up (subscribe) for a listserv discussion group, which is an automatic depository for information. If you subscribe, you receive everything that the list receives. A listserv is also known as a mailing list.

For example, if you belong to the K-12 educational technology mailing list, then each time someone sends mail to that list, you will receive it as well. There are more listservs than you can imagine, and it will take some exploration to find out which ones fit your needs.

To subscribe to a mailing list, you need to send a message to the list's administrator. As soon as you do that, a constant stream of messages will come your way. But be careful—if a list is very active, you can receive hundreds of messages in 1 day. If you go even a day without checking your mail, your electronic mailbox is likely to get so full of messages that you won't be able to read anything! Imagine your real mailbox outside your apartment or home. When it gets stuffed full, it is very difficult to pull out any one piece because the mail is packed so tightly. You would need a bigger box (more storage space), or you need to empty the box before it gets so full. Such is the case with an Internet mailing list: Either get a larger e-mail box (ask for more storage space from the system administrator) or check your mail more than once per day.

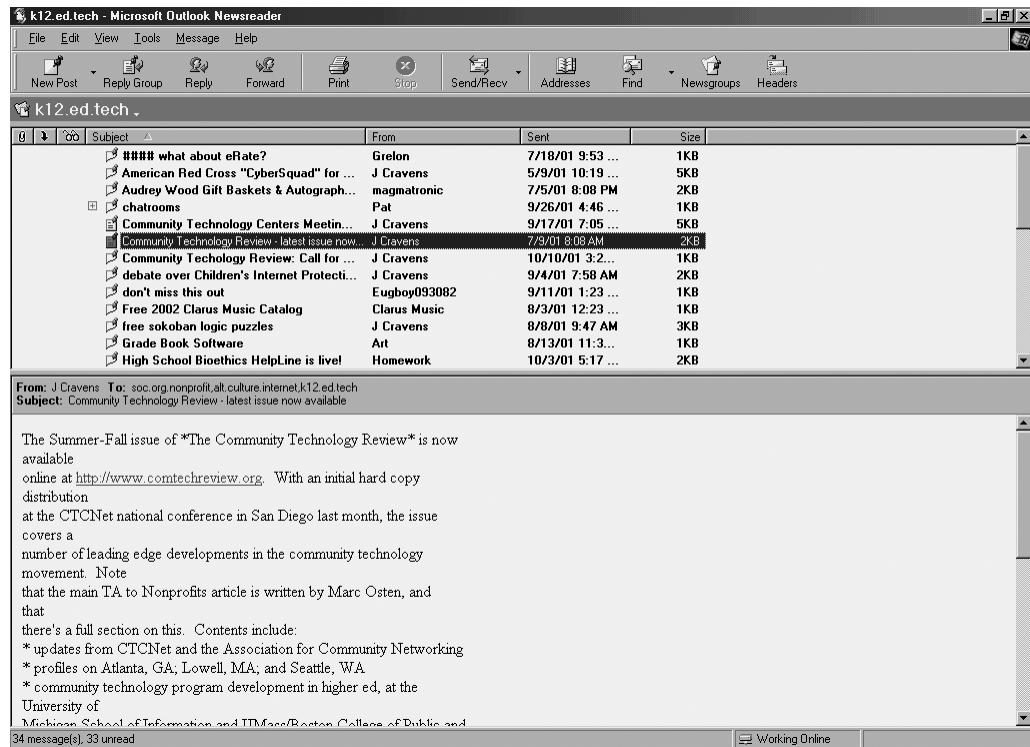


Figure 3.10 The newsgroup is a wide-open community where everyone is welcome to contribute and learn.

Exploring the WWW

Now we are ready to actually explore the Internet and use what many people find to be the most attractive aspect of the Internet—the World Wide Web.

You already know that the Internet is a network of networks. The World Wide Web (or the Web) is a collection of graphical documents representing different locations that are linked to one another, such that clicking on a particular word or picture or sound in one can quickly take you to another. On the Web, you will find what are called distributed hypertext documents. These documents, also called home pages, contain hot links, which connect one home page to another. To see and use these home pages and hot links, you need a viewer, and that is where your browser (such as Internet Explorer) comes in.

Explorer is one of many browsers that can be used for exploring the Web. There are other viewers and they all work pretty well. I selected Explorer to use as an example in this book because it is the most frequently used browser and is also available for free.

A Bit About Home Pages

A **home page** is a collection of information, and each home page has some very similar characteristics. You can get to different home pages in a variety of ways, which I will explain more about in this chapter. For now let's explore one of the opening home pages for the Library of Congress (shown in Figure 3.11), which is not a bad place to start for any search.

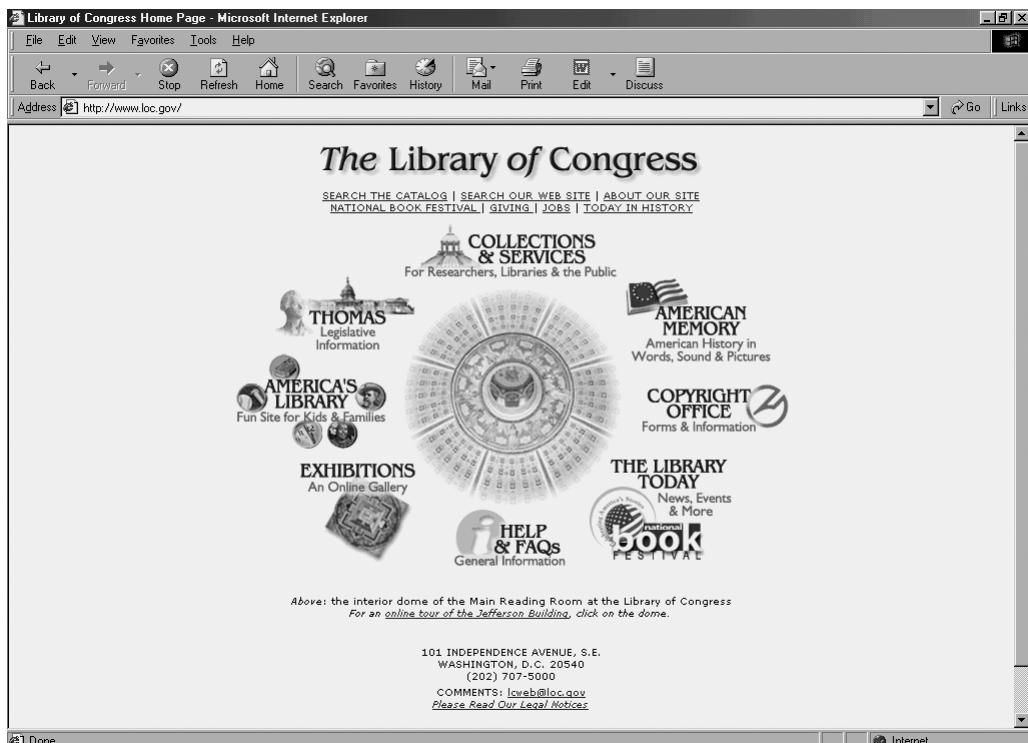


Figure 3.11 The Library of Congress home page.

At the top of the page, you see the title Library of Congress Home Page. The title tells you what the current home page is.

The Location text box shows you the address (<http://www.loc.gov/>). This is an address on the Web and is also called a URL for universal resource locator. Once you know the URL for a particular home page, you can just enter the URL in the Location text box and press Enter. By their nature, URLs are cryptic and it is tough to tell where one is physically located or what institution is sponsoring the home page. That means it is handy to keep a running list of the URLs you like and want to visit again. In the Internet Explorer Browser, use the Favorites button to accomplish this.

Then there's the main portion of the screen showing the contents of the home page, which shows a nice graphic of the Library of Congress main building and a listing of various options that you can click, such as the Collections & Services button that will allow you to search the entire Library of Congress, all millions of documents.

So where do you find great home pages, not just the ones that are fun (like the Motley Fool at www.fool.com) but those that you would find useful for your own work? This is the \$64,000 question. There is no central listing of home pages, so you cannot go to a directory or some other source and find something like "All the Home Pages on the World Wide Web." You cannot do this because the Web and the number of pages on it are changing rapidly. Many books offer different listings, but some of those books are out-of-date before they are published.

The best way to find home pages, however, is to explore the Web using a **search engine**, which is a sophisticated tool that uses algorithms or logical systems to search for what it is that you might want to find. We'll get to search engines in the next section of this chapter, but never forget to talk with your colleagues to find out what they are discovering. When you find a terrific home page, save its location as a bookmark and share that information with a friend.

Do you have some time right now and want to have some fun? Try UrouLette. This home page, created at the University of Kansas, allows you to click on a roulette wheel (what else?) and go to a home page. Which one? It selects home pages at random, so you might find yourself at a home page on x-rays in Uganda, or get the software you need to run your hockey team from HockeyWeb.com at <http://www.hockeyweb.com/HomePage/HOME PAGE.asp> or Point Grey Mini School in Vancouver, British Columbia (<http://trinculo.edu.sfu.ca/pgm/pgmhome.html>), or “Gleanings from the Writings of Bahá’u’lláh”(<http://www.cs.cornell.edu/Information/People/kalantar/Writings/Bahaullah/GWB/secu24.html>).

By now you probably want the URL for UrouLette, right? Here it is: <http://www.uroulette.com>. Just click on the roulette wheel and have fun.

Searching on the Web: Great Search Engines

Although there is no central listing of Web sites, there are search engines that can help you find what you are interested in. For example, the most popular search engine is Google (www.google.com). Fill in the term you are looking for and click Google Search and you are bound to find material you can use. Better yet, combine words such as “resume nursing” to find people who have entered that phrase on their résumé. Type in www.yahoo.com, which takes you to an opening page with hundreds of links to topics in every area imaginable.

For example, let's say you are interested in finding information on hyperactive children. Figure 3.12 shows the term entered in the search area of Google and the results of that search.

Practice using search engines to learn how to get the results you want.

The screenshot shows a Microsoft Internet Explorer window with the title bar "Google Search: hyperactive children - Microsoft Internet Explorer". The address bar contains the URL "http://www.google.com/search?q=hyperactive+children&spell=1". The main content area displays the Google search results for the query "hyperactive children". The results include links to various websites, such as HACSG, docnet, and BBC News, with descriptions and caching options. The interface includes standard browser controls like Back, Forward, Stop, Refresh, Home, and a toolbar with Advanced Search, Preferences, Language Tools, and Search Tips.

Figure 3.12 The results of a Google search. Reprinted with permission of Google™ Inc. Google Brand Features are trademarks of Google, Inc.

Once the search is done, the results show several suggested links that you can then click on to find out the contents of the home pages that were found.

Google is one of many different search engines that help you to find information that may be contained in a home page on the Web. And wouldn't you know it, but some ambitious web master placed hundreds of search engines on one page. You can locate the All-In-One search page by pointing your World Wide Web browser at <http://www.allonesearch.com/all1srch.html>, and then examine the many search engines and what they do. The site www.searchengines.com also gives you a huge amount of information on search engines and how they help you.

Are all search engines created equally? No. Some give you very precise results, whereas others give you general categories from which you can begin your search. It's best to experiment with several different search engines until you find the one that best suits the way you like to work or the one that finds what you want.

Table 3.5 offers a brief description of many of the most popular search engines available today, including their name, home page, and description.

And how to best use a search engine? Here are some tips:

- Use Table 3.5 and come as close as you can to determine which search engine might produce the best results given your needs.
- Enter the most narrow search terms you can and then broaden your search from there. Entering intelligence will find lots of stuff, most of it irrelevant. But if you enter intelligence and children and school, the results will be much more manageable and closer to what you want. Remember that the fewer the words you enter, the more general the results.
- If you use more than one word, either join them with the conjunction "and" or use quotes, such as bilingual and education or "bilingual education."
- If there is a help file or function that comes along with the search engine, open it and read it. It will have invaluable information that will save you time and effort.
- When you get more accustomed to using a search engine, look for the more advanced searching techniques and use them.
- Didn't get what you wanted? The most simple solution? Check your typing. Simple typos spell disaster.
- Try a synonym for the term or terms you're looking for. There's more than one way to eviscerate a feline (get it?).

Guess who the ultimate searcher is? Your reference librarian, who is well-trained and should be one of your main tools when you undertake any type of research or literature review.

Writing the Literature Review

It is now time to take all the information you have collected using all the tools you have learned about in this chapter and somehow organize it so it begins to make sense. This is your review of literature, and now you need to actually write it (horrors!). Here are some writing hints.

First, *read other literature reviews*. There is no arguing with success. Ask a student who has already been through this course or your adviser for a successful proposal. Look carefully at the format as well as the content of the literature review. Also, look at some of the sources mentioned earlier in this chapter, especially sources that are reviews of the literature, journal articles, and other review papers.

Second, *create a unified theme*, or a line of thought, throughout the review. Your review of literature is not supposed to be a novel, but most good literature reviews build from

Search Engine Name	Where to Find It	What It Does . . .
Lycos	www.lycos.com	Lycos provides a good selection of advanced search capabilities like the ability to search for specific media types (JPEG files, Java scripts, and so on), and its advanced search Lycos Pro provides even more options.
Hotbot	www.hotbot.com	This is the search site of <i>Wired</i> magazine, whose search engine Inktomi also powers Snap.com's and Yahoo's Web searches. It is an excellent tool for finding specific information. In addition to a thorough and up-to-date index, it provides an easy interface for constructing precise search queries.
Metacrawler	www.metacrawler.com	This is a metasearch site that simultaneously searches Yahoo, Excite, and five other search engines, then aggregates the results.
Ilor	www.ilor.com	The results of a search using Ilor are quite different from what you obtain using other search engines. When the cursor arrow is placed over a search result, an option menu appears that provides options such as opening the results in a separate window or placing on an individual list to save for later use.
Google	www.google.com	This is currently the most popular search engine available. Google uses PageRank™, a system for ranking Web pages developed by Google founders Larry Page and Sergey Brin at Stanford University. PageRank relies on the democratic nature of the Web by using its link structure as an indicator of an individual page's value. Google interprets a link from page A to page B as a vote, by page A for page B. Important, high-quality sites receive a higher PageRank, which Google remembers each time it conducts a search.
Internet Sleuth	www.isleuth.com	Internet Sleuth is a 3000-strong collection of specialized online databases which can also simultaneously search up to six other search sites for Web pages, news, and other types of information.
Dogpile	www.dogpile.com	This metasearch site can go through 13 Web search engines and more than two dozen online news services or other types of sources, and sorts the results by the search engine that found them.
Ask Jeeves	www.askjeeves.com	An excellent beginner's site that's also good for anyone's general queries, Ask Jeeves leads the user through questions to help narrow the search and simultaneously searches six other search sites for relevant Web pages.
Excite	www.excite.com	Excite is good for searches on broad general topics and adds extras like a simultaneous search of the Web news headlines, sports scores, and company information and then groups the relevant results on a single page.
Yahoo	www.yahoo.com	A human-compiled directory of Web sites, Yahoo doesn't help search for the contents of individual Web pages but it is excellent for researching broad general topics.
Altavista	www.altavista.com	Altavista is quick and provides very detailed results in its search of over 250,000,000 Web pages.

Table 3.5 Some popular search engines and how they work.

a very general argument to a more specific one and set the stage for the purpose of the research. You should bring the reader “into the fold” and create some interest in where you will be going with this research that other people have not gone.

Third, *use a system to organize your materials*. Most reviews of the literature will be organized chronologically within topics. For example, if you are studying gender differences in anxiety and verbal ability among adults, you would organize all the references by topic area (anxiety and verbal ability), and then within each of these topics, begin your review with the earliest dated reference. In this way you move from the earliest to the latest and provide some historical perspective.

Fourth, *work from an outline*. If you are an accomplished and skilled writer, you can ignore this suggestion. However if you are just starting out, it is a good idea to use this tool to help organize the main thought in your proposal before you begin the actual writing process.

Fifth, *build bridges between the different areas that you review*. For example, if you are conducting a cross-cultural study comparing the way that East Indian and American parents discipline their children, you might not find a great deal of literature on that specific topic. But there is certainly voluminous literature on child rearing in America and in India and tons of references on discipline. Part of the creative effort in writing a proposal is being able to show where these two come together in an interesting and potentially fruitful way.

Sixth, *practice may not always make perfect but it certainly doesn't hurt*. For some reason, most people believe that a person is born with or without a talent for writing. Any successful writer would admit that to be a class-A basketball player or an accomplished violinist, one has to practice. Should it be any different for a writer? Should you have any doubts about this question, ask a serious writer how many hours a day or week he or she practices that craft. More often than not, you will see it is the equivalent of the ball player or the musician. In fact, a writer friend of mine gives this advice to people who want to write but don't have a good idea about the level of involvement it requires: “Just sit down at your typewriter or word processor, and open a vein.” That is how easy it is.

So the last (but really the first) hint is to *practice your writing*. As you work at it and find out where you need to improve (get feedback from other students and professors), you will indeed see a change for the better.

Summary

Everyone who does research starts somewhere, and most of the time a review of the literature puts ideas and goals into perspective. The literature, and all the tools available to work with the literature, is your first and best ally in putting together a well-researched and comprehensive discussion of what has occurred in the past. Once important variables are identified, you need to turn your attention to how these variables can be measured, which is the focus of the next chapter.

Exercises

1. Make a list of 10 research topics that you would find interesting to pursue. These can be any topics dealing with education or psychology that you might glean from newspapers, radio and television news, magazines, research journals, and even overheard conversations. Rank these various ideas by level of interest, and for each of the top five write one sentence explaining why it appeals to you.

2. Take the idea that you ranked No.1 above and do the following:
 - (a) Write a one-paragraph description of a study that incorporates that idea.
 - (b) List the steps you could take in reviewing the specific literature relevant to this topic.
 - (c) From this idea, generate three more questions derived from the original question or idea.
3. Use the idea that you ranked No. 2 above and do the following:
 - (a) Locate a related reference from a journal and write out the complete citation.
 - (b) Locate an abstract from a study that focuses on the topic.
4. Find 10 other sources of information about any of the topics you ranked in Exercise 1 above and write out the complete citation for each. Try to complete a set of other sources that is as diverse as possible.
5. Go to your library and find five journals in your field of study. After you have located the journals, examine them to determine:
 - (a) What type of articles are published (reviews of literature, empirical studies, etc.).
 - (b) Whether the journal is published by a professional organization (such as the American Psychological Association) or by a private group (such as Sage Press).
 - (c) The number of articles in each journal and if there is any similarity in the topic areas covered within each issue of the journal.
 - (d) How often the journal is published and other information about its editorial policies (e.g., guidelines, features).
6. Select any topic that you are interested in and use three different search engines to obtain online information. How do the results differ? Which one gave you the most interesting and useful information? How might you revise your search terms to get the same degree of usefulness from other search engines?
7. Find three abstracts from recent research journals. For each abstract identify the following:
 - (a) The purpose
 - (b) The hypothesis
 - (c) The type of study (e.g., correlational, experimental)
 - (d) The conclusion
8. You have been assigned the topic of gender differences in adolescent development for a research study. Formulate five research questions that address this topic.
9. Use the Internet to find five references on any of the topics in which you have an interest (as you defined in earlier questions).

Want to Know More?

Further Readings

Goldberg, F. S. (1988). Telecommunications and the classroom: Where we've been and where we should be going. *Computing Teacher*, 15(8), 26–30.

Discusses the use of telecommunications and highlights projects designed by the New York City Board of Education to investigate telecommunications alterna-

tives for the classroom. Some of the models described are online research, user-supported libraries, and computer-mediated dialogues.

Johnson, S., Anglin, L., Kavanagh, L. Greenfield T., & Giesbrecht, N. (1999). The impact of Internet information resources on research strategies: A case study in alcohol policy analysis. *Behavioral and Social Sciences Librarian*, 17 (2) 33–46.

The impact of resources from the Internet on the development of research strategies based on a study of federal alcohol control policy is explored.

O'Sullivan, M., & Scott, T. (2000). Teaching Internet information literacy: A critical evaluation 2000. *MultiMedia Schools*, 7(2), 40–42.

This paper discusses the use of the Internet as a resource for secondary school students and outlines a 3-day Internet Information Literacy unit that was designed to improve students' critical thinking skills.

Stewart, L., & Olsen, J. (1988). Compact disk databases: Are they good for users? *Online*, 12, 48–52.

Looks at four groups of undergraduate students researching assigned topics using printed and CD-ROM versions of ERIC. One group was given formal instruction with the CD-ROM, one group used the CD-ROM without instruction, a third group used the printed version with instruction, and the last group used the printed version without instruction. Results illustrate the advantages of using the CD-ROM for searches.

Vakkari, P. (2000). Cognition, sources and contributory information of documents in writing a research proposal: A longitudinal case study. *Proceedings of the ASIS Annual Meeting*, 37, 352–362.

This study examined how students' problem stages in the writing of their research proposals for a masters thesis are reflected in their choice of sources and access points to documents, as well as in contributory information types in documents.

Readings of Other Interest

Edelman, G. M. (1989). *The remembered present*. New York: Basic Books.

After stating the problem, this book presents the author's theory of the brain (neural Darwinism) with supportive logic, past information, and opinion. You can see how a problem can be connected to a theory and the logic used.

Meriwether, N. *12 easy steps to successful research papers*. (1996) Lincolnwood, IL: NTC Publishing.

This book walks the writer through the 12 steps of writing a research paper using the same subject, with a completed research paper in appendix A.

Rodrigues, D., & Rodrigues, R. (1999). *The Research Paper and the World Wide Web*. Upper Saddle River, NJ: Prentice-Hall.

This book is full of practical writing assignments and provides students in all fields with strategies for conducting research on the Internet. It contains a guide to writing research papers and an introduction to Web searching, and demonstrates how to use Web tools to search the Web and libraries on the Internet.

Strunk, W., & White, E. B. (1959). *The elements of style*. New York: Macmillan.

This book contains simple and straightforward rules and tips on how to improve your writing. A must for anyone who writes anything!

And on the Internet. . .

The Gale Database Directory

The Gale Database Directory at <http://library.dialog.com/bluesheets/html/bl0230.html> provides detailed information on publicly available databases and database products that are accessible through an online vendor or the Internet.

The GPO Database List

Want to see how a HUGE amount of data can be organized and easily accessible to the online user? Check the U.S. Government Printing Office (GPO) database online at http://www.access.gpo.gov/su_docs/db2.html. You can find out about everything referred in a specific House or Senate session through the Congressional Quarterly or what bills have been passed. Best of all, this whole collection illustrates what power is possible when the Web and databases come together.

The National Library of Medicine Databases

The National Library of Medicine provides a wide variety of past and present resources related to the biomedical and health sciences at <http://www.nlm.nih.gov/databases/databases.html>. The format of databases varies, including being searchable to just bibliographic citations to full text. You'll find tons of stuff for the social and behavioral sciences researcher as well as the aspiring nuclear scientist.

