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2-Types of Sources
Categorizing Sources

Understanding types of sources helps guide your search.

Once you have your research question, you’ll need information sources to answer it and meet the other information needs of your research project.

This section about categorizing sources will increase your sophistication about them and save you time in the long run because you’ll understand the “big picture”. That big picture will be useful as you plan your own sources for a specific research project, which we’ll help you with in the next section Sources and Information Needs.

You’ll usually have a lot of sources available to meet the information needs of your projects. In today’s complex information landscape, just about anything that contains information can be considered a potential source.

Here are a few examples:

- Books and encyclopedias
- Websites, web pages, and blogs
- Magazine, journal, and newspaper articles
- Research reports and conference papers
- Field notes and diaries
• Photographs, paintings, cartoons, and other art works
• TV and radio programs, podcasts, movies, and videos
• Illuminated manuscripts and artifacts
• Bones, minerals, and fossils
• Preserved tissues and organs
• Architectural plans and maps
• Pamphlets and government documents
• Music scores and recorded performances
• Dance notation and theater set models

With so many sources available, the question usually is not whether sources exist for your project but which ones will best meet your information needs.

Being able to categorize a source helps you understand the kind of information it contains, which is a big clue to (1) whether it might meet one or more of your information needs and (2) where to look for it and similar sources.

A source can be categorized by:

• Whether it contains quantitative or qualitative information or both
• Whether the source is objective (factual) or persuasive (opinion) and may be biased
• Whether the source is a scholarly, professional or popular publication
• Whether the material is a primary, secondary or tertiary source
• What format the source is in

As you may already be able to tell, sources can be in more than one category at the same time because the categories are not mutually exclusive.
Quantitative or Qualitative

One of the most obvious ways to categorize information is by whether it is quantitative or qualitative. Some sources contain either quantitative information or qualitative information, but sources often contain both.

Many people first think of information as something like what's in a table or spreadsheet of numbers and words. But information can be conveyed in more ways than textually or numerically.

**Quantitative Information** – Involves a measurable quantity—numbers are used. Some examples are length, mass, temperature, and time. Quantitative information is often called data, but can also be things other than numbers.

**Qualitative Information** – Involves a descriptive judgment using concept words instead of numbers. Gender, country name, animal species, and emotional state are examples of qualitative information.

Take a quick look at the Example table below. Another way we could display the table’s numerical information is in a graphic format—listing the students’ ages or GPAs on a bar chart, for example, rather than in a list of numbers. Or, all the information in the table could be displayed instead as a video of each student giving those details about themselves.
Increasingly, other formats (such as images, sound, and video) may be used as information or used to convey information. Some examples:

- A video of someone watching scenes from horror movies, with information about their heart rate and blood pressure embedded in the video. Instead of getting a description of the person’s reactions to the scenes, you can see their reactions.
- A database of information about birds, which includes a sound file for each bird singing. Would you prefer a verbal description of a bird’s song or an audio clip?
- A list of colors, which include an image of the actual color. Such a list is extremely helpful, especially when there are a lot of color names.
- A friend orally tells you that a new pizza place is 3 blocks away, charges $2 a slice, and that the pizza is delicious. This may never be recorded, but it may be very valuable information if you’re hungry!
- A map of Ohio with counties shaded different intensities of red according to the median household income of inhabitants.
**ACTIVITY: Quantitative vs. Qualitative**

What quantitative and qualitative data components might you use to describe yourself? See the bottom of the page for some possible answers.

**ACTIVITY: Multiple Data Displays**

Take a look at the Wikipedia article about UN Secretaries-General. Scroll down and view the table of people who served as Secretary-General. In what ways is information conveyed in ways other than text or numbers? See the bottom of the page for answers.

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**ANSWER TO ACTIVITY: Quantitative vs. Qualitative**

The answer to the “Quantitative vs. Qualitative” Activity above is:

Quantitative: age, weight, GPA, income
Qualitative: race, gender, class (freshman, sophomore, etc.), major

Are there others?

**ANSWER TO ACTIVITY: Multiple Data Displays**

The answer to the “Multiple Data Displays” Activity above is:

- A photo of each secretary general
- The flag of their country of origin
- A world map with their country of origin shaded

Are there others?
Fact or Opinion

Thinking about the reason an author produced a source can be helpful to you because that reason was what dictated the kind of information he/she chose to include. Depending on that purpose, the author may have chosen to include factual, analytical, and objective information. Or, instead, it may have suited his/her purpose to include information that was subjective and therefore less factual and analytical. The author’s reason for producing the source also determined whether he or she included more than one perspective or just his/her own.

Authors typically want to do at least one of the following:

• Inform and educate
• Persuade
• Sell services or products or
• Entertain

Combined Purposes

Sometimes authors have a combination of purposes, as when a marketer decides he can sell more smart phones with an informative sales video that also entertains us. The same is true when a singer writes and performs a song that entertains us but that she intends to make available for sale. Other examples of authors having multiple purposes occur in most scholarly writing.

In those cases, authors certainly want to inform and educate their audiences. But they also want to persuade their audiences that what they are reporting and/or postulating is a true description of a situation, event, or phenomenon or a valid argument that their audience must take a particular action. In this blend of scholarly author’s purposes, the intent to educate and inform is considered to trump the intent to persuade.

Why Intent Matters

Authors’ intent usually matters in how useful their information can be to your research project, depending on which information need you are trying to meet. For instance, when you're looking for sources that will help you actually decide your answer to your research question or evidence for your
answer that you will share with your audience, you will want the author’s main purpose to have been to inform or educate his/her audience. That’s because, with that intent, he/she is likely to have used:

- Facts where possible.
- Multiple perspectives instead of just his/her own.
- Little subjective information.
- Seemingly unbiased, objective language that cites where he/she got the information.

The reason you want that kind of resource when trying to answer your research question or explaining that answer is that all of those characteristics will lend credibility to the argument you are making with your project. Both you and your audience will simply find it easier to believe—will have more confidence in the argument being made—when you include those types of sources.

Sources whose authors intend only to persuade others won’t meet your information need for an answer to your research question or evidence with which to convince your audience. That’s because they don’t always confine themselves to facts. Instead, they tell us their opinions without backing them up with evidence. If you used those sources, your readers will notice and not believe your argument.

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Fact vs. Opinion vs. Objective vs. Subjective

Need to brush up on the differences between fact, objective information, subjective information, and opinion?

**Fact** – Facts are useful to inform or make an argument.

Examples:
- The United States was established in 1776.
- The pH levels in acids are lower than pH levels in alkalines.
- Beethoven had a reputation as a virtuoso pianist.

**Opinion** – Opinions are useful to persuade, but careful readers and listeners will notice and demand evidence to back them up.

Examples:
- That was a good movie.
- Strawberries taste better blueberries.
- George Clooney is the sexiest actor alive.
- The death penalty is wrong.
- Beethoven’s reputation as a virtuoso pianist is overrated.

**Objective** – Objective information reflects a research finding or multiple perspectives that are not biased.

Examples:
- “Several studies show that an active lifestyle reduces the risk of heart disease and diabetes.”
• “Studies from the Brown University Medical School show that twenty-somethings eat 25 percent more fast-food meals at this age than they did as teenagers.”

**Subjective** – Subjective information presents one person or organization’s perspective or interpretation. Subjective information can be meant to distort, or it can reflect educated and informed thinking. All opinions are subjective, but some are backed up with facts more than others.

Examples:

• “The simple truth is this: As human beings, we were meant to move.”
• “In their thirties, women should stock up on calcium to ensure strong, dense bones and to ward off osteoporosis later in life.”

“In this quote, it’s mostly the “should” that makes it subjective. The objective version of the last quote would read: “Studies have shown that women who begin taking calcium in their 30s show stronger bone density and fewer repercussions of osteoporosis than women who did not take calcium at all.” But perhaps there are other data showing complications from taking calcium. That’s why drawing the conclusion that requires a “should” makes the statement subjective.

**ACTIVITY: Fact, Opinion, Objective, or Subjective?**

Open activity in a web browser.
<table>
<thead>
<tr>
<th>Primary Source</th>
<th>J.D. Salinger’s novel Catcher in the Rye.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Original,</td>
<td></td>
</tr>
<tr>
<td>Firsthand Information)</td>
<td></td>
</tr>
<tr>
<td>Secondary Source</td>
<td>A book review of Catcher in the Rye, even if the reviewer has a different opinion than anyone else has ever published about the book- he or she is still just reviewing the original work and all the information about the book here is secondary.</td>
</tr>
<tr>
<td>(Secondhand Information)</td>
<td></td>
</tr>
<tr>
<td>Tertiary Source</td>
<td>Wikipedia page about J.D. Salinger.</td>
</tr>
<tr>
<td>(Third-hand Information)</td>
<td></td>
</tr>
</tbody>
</table>

**Primary, Secondary & Tertiary Sources**

Another information category is called publication mode and has to do with whether the information is

- Firsthand information (information in its original form, not translated or published in another form).
- Secondhand information (a restatement, analysis, or interpretation of original information).
- Third-hand information (a summary or repackaging of original information, often based on secondary information that has been published).

The three labels for information sources in this category are, respectively, primary sources, secondary sources, and tertiary sources. Here are examples to illustrate the first-handedness, second-handedness, and third-handedness of information:

When you make distinctions between primary, secondary, and tertiary sources, you are relating the information itself to the context in which it was created. Understanding that relationship is an important skill that you’ll need in college, as well as in the workplace. Noting the relationship between creation and context helps us understand the “big picture” in which information operates and helps us figure out which information we can depend on. That’s a big part of thinking critically, a major benefit of actually becoming an educated person.

**Primary Sources** – Because it is in its original form, the information in primary sources has reached us
from its creators without going through any filter. We get it firsthand. Here are some examples that are often used as primary sources:

- Any literary work, including novels, plays, and poems.
- Breaking news.
- Diaries.
- Advertisements.
- Music and dance performances.
- Eyewitness accounts, including photographs and recorded interviews.
- Artworks.
- Data.
- Blog entries that are autobiographical.
- Scholarly blogs that provide data or are highly theoretical, even though they contain no autobiography.
- Artifacts such as tools, clothing, or other objects.
- Original documents such as tax returns, marriage licenses, and transcripts of trials.
- Websites, although many are secondary.
- Buildings.
- Correspondence, including email.
- Records of organizations and government agencies.
- Journal articles that report research for the first time (at least the parts about the new research, plus their data).

**Secondary Source** – These sources are translated, repackaged, restated, analyzed, or interpreted original information that is a primary source. Thus, the information comes to us secondhand, or through at least one filter. Here are some examples that are often used as secondary sources:

- All nonfiction books and magazine articles except autobiography.
- An article or website that critiques a novel, play, painting, or piece of music.
- An article or website that synthesizes expert opinion and several eyewitness accounts for a new understanding of an event.
- The literature review portion of a journal article.

**Tertiary Source** – These sources further repackaged the original information because they index, condense, or summarize the original.

Typically, by the time tertiary sources are developed, there have been many secondary sources prepared on their subjects, and you can think of tertiary sources as information that comes to us “third-hand.” Tertiary sources are usually publications that you are not intended to read from cover to cover but to dip in and out of for the information you need. You can think of them as a good place for background information to start your research but a bad place to end up. Here are some examples that are often used as tertiary sources:

- Almanacs.
- Dictionaries.
- Guide books, including the one you are now reading.
- Survey articles.
- Timelines.
• Bibliographies.
• Encyclopedias, including Wikipedia.
• Most textbooks.

Tertiary sources are usually not acceptable as cited sources in college research projects because they are so far from firsthand information. That’s why most professors don’t want you to use Wikipedia as a citable source: the information in Wikipedia is far from original information. Other people have considered it, decided what they think about it, rearranged it, and summarized it—all of which is actually what your professors want you, not another author, to do with information in your research projects.

ACTIVITY: Which Kind of Source?

Open activity in a web browser.

The Details Are Tricky— A few things about primary or secondary sources might surprise you:

• Sources become primary rather than always exist as primary sources.

It’s easy to think that it is the format of primary sources that makes them primary. But that’s not all that matters. So when you see lists like the one above of sources that are often used as primary sources, it’s wise to remember that the ones listed are not automatically already primary sources. Firsthand sources get that designation only when researchers actually find their information relevant and use it.

For instance: Records that could be relevant to those studying government are created every day by federal, state, county, and city governments as they operate. But until those raw data are actually used by a researcher, they cannot be considered primary sources.

Another example: A diary about his flying missions kept by an American helicopter pilot in the Viet Nam War is not a primary source until, say, a researcher uses it in her study of how the war was carried out. But it will never be a primary source for a researcher studying the U.S. public’s reaction to the war because it does not contain information relevant to that study.

• Primary sources, even eyewitness accounts, are not necessarily accurate. Their accuracy has to be evaluated, just like that of all sources.

• Something that is usually considered a secondary source can be considered a primary source, depending on the research project.

For instance, movie reviews are usually considered secondary sources. But if your research project is about the effect movie reviews have on ticket sales, the movie reviews you study would become primary sources.

• Deciding whether to consider a journal article a primary or a secondary source can be complicated for at least two reasons.

First, journal articles that report new research for the first time are usually based on data. So some disciplines consider the data to be the primary source, and the journal article that describes and analyzes them is considered a secondary source.
However, particularly in the sciences, the original researcher might find it difficult or impossible (he or she might not be allowed) to share the data. So sometimes you have nothing more firsthand than the journal article, which argues for calling it the relevant primary source because it’s the closest thing that exists to the data.

Second, even journal articles that announce new research for the first time usually contain more than data. They also typically contain secondary source elements, such as a literature review, bibliography, and sections on data analysis and interpretation. So they can actually be a mix of primary and secondary elements. Even so, in some disciplines, a journal article that announces new research findings for the first time is considered to be, as a whole, a primary source for the researchers using it.

**ACTIVITY: Under What Circumstances?**

**Instructions:** Look at each of the sources listed below and think of circumstances under which each could become a primary source. (There are probably many potential circumstances for each.) So just imagine you are a researcher with projects that would make each item firsthand information that is relevant to your work. What could a project be about that would make each source relevant firsthand information? Our answers are at the bottom of the page, but remember that there are many more—including the ones you think of that we didn’t!

1. Fallingwater, a Pennsylvania home designed and constructed by Frank Lloyd Wright in the 1930s.
3. An arrowhead made by (Floriday) Seminole Native Americans but found at Flint Ridge outside Columbus, Ohio.
4. E-mail between the U.S. ambassador to the United Nations, Nikki Haley, and her staff about North Korea.
5. A marriage license.

Despite their trickiness, what primary sources usually offer is too good not to consider using because:

- They are original. This unfiltered, firsthand information is not available anywhere else.
- Their creator was a type of person unlike others in your research project, and you want to include that perspective.
- Their creator was present at an event and shares an eyewitness account.
- They are objects that existed at the particular time your project is studying.

Particularly in humanities courses, your professor may require you to use a certain number of primary sources for your project. In other courses, particularly in the sciences, you may be required to use only primary sources.

What are considered primary and secondary sources can vary from discipline to discipline. If you are required to use primary sources for your research project, before getting too deep into your project check with your professor to make sure he or she agrees with your choices. After all, it’s your professor who will be grading your project. A librarian, too, can verify your choices. Just remember to take a
copy of your assignment with you when you ask, because the librarian will want to see the original assignment. After all, that’s a primary source!

POSSIBLE ANSWERS TO ACTIVITY: Under What Circumstances?

1. You are doing a study of the entrances Wright designed for homes, which were smaller than other architects of the time typically designed entrances.
2. Your research project is about the Auden-Yeats relationship.
3. Your research project is about trade among 19th century Native Americans east of the Mississippi River.
4. Your research project is on how Ambassador Haley conveyed a decision about North Korea to her staff.
5. You are writing about the life of a person who claimed to have married several times, and you need more than her statements about when those marriages took place and to whom.
Popular, Professional, & Scholarly

We can also categorize information by the expertise of its intended audience. Considering the intended audience—how expert one has to be to understand the information—can indicate whether the source has sufficient credibility and thoroughness to meet your need.

There are varying degrees of expertise:

**Popular** – Popular newspaper and magazine articles (such as *The Washington Post*, the *New Yorker*, and *Rolling Stone*) are meant for a large general audience, are generally affordable, and are easy to purchase or available for free. They are written by staff writers or reporters for the general public.

Additionally, they are:

- About news, opinions, background information, and entertainment.
- More attractive than scholarly journals, with catchy titles, attractive artwork, and many advertisements but no footnotes or references.
- Published by commercial publishers.
- Published after approval from an editor.
- For information on using news articles as sources (from newspapers in print and online, broadcast news outlets, news aggregators, news databases, news feeds, social media, blogs, and citizen journalism), see News as a Source.

**Professional** – Professional magazine articles (such as *Plastic Surgical Nursing* and *Music Teacher*) are meant for people in a particular profession, and are often accessible through a professional organization. Staff writers or other professionals in the targeted field write these articles at a level and with the language to be understood by everyone in the profession.

Additionally, they are:

- About trends and news from the targeted field, book reviews, and case studies.
- Often less than 10 pages, some of which may contain footnotes and references.
- Usually published by professional associations and commercial publishers.
- Published after approval from an editor.

**Scholarly** – Scholarly journal articles (such as *Plant Science* and *Education and Child Psychology*) are meant for scholars, students, and the general public who want a deep understanding of a problem or issue. Researchers and scholars write these articles to present new knowledge and further understanding of their field of study.

Additionally, they are:

- Where findings of research projects, data and analytics, and case studies usually appear first.
• Often long (usually over 10 pages) and always include footnotes and references.
• Usually published by universities, professional associations, and commercial publishers.
• Published after approval by peer review or from the journal’s editor.

See Scholarly Articles as Sources for more detail.

**TIP: Source Locator**

Our Source Locator can help you see where sources of every audience expertise level (popular, professional, and scholarly) are located.

**ACTIVITY: Popular, Professional, or Scholarly?**

Open activity in a web browser.
We can also categorize sources by publication format. That’s because of the difference in time and effort sources in each format require for their production.

Sources in particular formats simply cannot exist until there has been enough time for people to create them. The result is that the sources that are created toward the end of the information lifecycle may come to very different conclusions about the event than did those sources created early on.

Sometimes the information presented in the later formats is more valid and reliable that what is in those produced earlier.

A very good example is that conclusions about the Columbine High School shooting in 1999 and the causes of that tragedy reached by books—which took years to complete after the event—were likely to be very different than the conclusions reached by news coverage created early on. For instance,
many early reports concluded that the two teens responsible for the shooting had been shunned by their classmates and that it was the pain of their exclusion that had moved them to take revenge. Consequently, many K-12 schools nationwide took steps to try to ensure that all students felt included in their student bodies. But more time-consuming reportage concluded that the boys were not shunned (one had had a date for prom activities just days before) and that it was mental illness that made them kill their classmates.

**MOVIE: Information Cycle**

This video explains what kinds of information sources about an event can exist at any point in time during and after that event.

View Movie | View Text Version

**ACTIVITY: The Information Lifecycle**

Open activity in a web browser.

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**A Closer Look at Common Formats**

**Books** – Usually a substantial amount of information, published at one time and requiring great effort on the part of the author and a publisher.

**Magazines/Journals** – Published frequently, containing lots of articles related to some general or specific professional research interest; edited.

**Newspapers** – Each is usually a daily publication of events of social, political and lifestyle interest.

**Web sites** – Digital items, each consisting of multiple pages produced by someone with technical skills or the ability to pay someone with technical skills.

**Articles** – Distinct, short, written pieces that might contain photos and are generally timely. Timeliness can mean that it’s something that is of interest to readers at the point of publication or that is something the writer is thinking about or researching at a given point of time.

**TIP: Evaluating Articles**

Evaluating whether articles are credible enough for your information need is similar to evaluating any other source. There’s more information on evaluating in Evaluating Sources.
Conference Papers – Written form of papers delivered at a professional or research-related conference. Authors are generally practicing professionals or scholars in the field.

Blogs – Frequently updated websites that do not necessarily require extensive technical skills and can be published by virtually anyone for no cost to themselves other than the time they devote to content creation. Usually marked by postings that indicate the date when each was written.

Documentaries – Works, such as a film or television program, presenting political, social, or historical subject matter in a factual and informative manner and often consisting of actual news films or interviews accompanied by narration.

Online Videos – Short videos produced by anybody, with a lot of money or a little money, about anything for the world to see. Common sites for these are YouTube and Vimeo.

Podcasts – Digital audio files, produced by anyone and about anything, that are available for downloading, often by subscription.

ACTIVITY: Best Format for Your Need

Open activity in a web browser.
Scholarly Articles as Sources

Articles in scholarly journals are valued for several reasons. First, they are usually trustworthy because their publication process includes a peer review that helps insure their accuracy and contribution to their disciplines. In addition, they often contain the first reports of new research, which makes their sections on methodology, data, analysis, and interpretation primary sources. Sometimes they instead consist of literature reviews summaries of multiple research studies done in the past on particular subjects of current interest. That makes those articles very helpful secondary sources.

Peer-Reviewed Sources

The most-respected scholarly journals are peer-reviewed, which means that experts in their field other than the author and editor check out each article before it can be published. It’s their responsibility to help guarantee that new material is presented in the context of what is already known, that the methods the researcher used are the right ones, and that the article contributes to the field.

For those reasons, peer-reviewed articles are more likely to be credible. Peer-reviewed journal articles are the official scholarly record, which means that if it’s an important development in research, it will probably turn up in a journal article eventually.

Here’s a longer explanation of the peer review process, which concludes that it is good but not perfect.

Parts of a Scholarly Article

The articles you use for your assignments must also be relevant to your research question—not just credible. Reading specific parts of an article can help save you time as you decide whether an article is relevant.

MOVIE: Guided Tour of Scholarly Articles

View playlist

Reading a scholarly article usually takes some effort. Here’s how to do it.
ACTIVITY: Parts of a Scholarly Article

Open activity in a web browser.

Finding Scholarly Articles

Most scholarly articles are housed in specialized databases. Libraries (public, school, or company) often provide access to scholarly databases by paying a subscription fee for patrons. For instance, OSU Libraries provide access to hundreds of databases via its Research Databases List that are made available free to people affiliated with the University. You can search for a journal title in these databases or view a list of databases by subject. For more information, including how to search databases, see Specialized Databases.

Databases that aren’t subject-specific are called general databases. Google Scholar is a free general scholarly database available to all who have access to the Internet, and it provides some scholarly articles. For more information, see our section on using Google Scholar.

TIP: Known Article Searching

What if you have a citation for an article you need and now have to find the actual text of the article? Follow these instructions to Access to a Known Journal Article.
News as a Source

News sources can provide insights that scholarly sources may not or that will take a long time to get into scholarly sources. For instance, news sources are excellent for finding out people's reactions, opinions, and prevailing attitudes around the time of an event.

So whether news sources are good for your assignment depends on what your research question is. (You'll find other relevant information at Sources and Information Needs.)

News is a strange term, because even when the information is old, it's still news. Some sources are great for breaking news, some are great for aggregated (or compiled) news, and others are great for historical news.

While news was transmitted for centuries only in newspapers, news is now transmitted in all formats: via radio, television, and the Internet, in addition to print. Even most newspapers have Internet sites today.

News must be brief because much of it gets reported only moments after an event happens. News reports occur early in the Information Lifecycle. See Publication Formats and the Information Lifecycle for more information.

When Are News Sources Helpful?

- You need breaking news or historical perspectives on a topic (what people were saying at the time).
- You need to learn more about a culture, place, or time period from its own sources.
- You want to keep up with what is going in the world today.

When Are News Sources of Limited Use?

- You need very detailed analysis by experts.
- You need sources that must be scholarly or modern views on a historical topic.

ACTIVITY: Using News Effectively

Open activity in a web browser.

Mainline and Non-Mainline News Sources

Mainline American news outlets stick with the tradition of trying to report the news as objectively as possibly. That doesn't mean their reports are perfectly objective, but they are more objective than the non-mainline sources. As a result, mainline news sources are more credible than non-mainline sources.

News from non-mainline American news outlets is often mixed with opinions. One way they frequently exhibit bias is that they leave out pertinent facts. Some examples of non-mainline American news outlets: MSNBC, Fox News, Gawker, Reddit.

Types of News Sources

Press Services—News outlets (print, broadcast, and online) get a lot of their news from these services, such as Reuters or Associated Press (AP), which make it unnecessary for individual outlets to send their own reporters everywhere. Services are so broadly used that you may have to look at several news outlets to get a different take on an event or situation.

News aggregators—Aggregators don’t have reporters of their own but simply collect and transmit the news reported by others. Some sources pull news from a variety of places and provide a single place to search for and view multiple stories. You can browse stories or search for a topic. Aggregators tend to have current, but not archival news. Google news and Yahoo News are examples.

Newspaper sites – Many print newspapers also have their own websites. They vary as to how much news they provide for free. Take a look at these examples.

- The Lantern, Ohio State University’s student newspaper
- The Columbus Dispatch
- USA Today
- The Boston Globe
- The Times of London
- China Daily, USA edition
- The New York Times

News Databases – Search current, recent, and historical newspaper content in databases provided free by libraries. OSU Libraries offers 69 news databases to students, staff, and faculty. They include:

- LexisNexis Academic – contains news back to 1980 from newspapers, broadcast transcripts, wire services, blogs, and more.
- Proquest Historical Newspapers – contains older content from several major U.S. newspapers.
- allAfrica – contains more than a million articles from 100 African news sources, 1996-present.
- Lantern Online – contains the archive of all of OSU’s student newspaper issues, 1881-1997.

See the complete list of OSU Libraries’ newspaper databases.
ACTIVITY: Choosing a Newspaper Database

Look at the list of OSU Libraries’ newspaper databases available to OSU users. Which one would be a good place to find an article with an international left perspective on a topic? Our answer is at the end of this section.

Broadcast News Sites – Although broadcast news (from radio and television) is generally consumed in real time, such organizations also offer archives of news stories on their web sites. However, not all of their articles are provided by their own reporters: some originate from the press services, Reuters and AP. Here are some examples of broadcast new sites:

- ABC News
- BBC
- CNN
- NPR News
- NBC Learns (OSU only)

ACTIVITY: One-Minute World News from the BBC

Visit BBC’s Video area and watch their One-minute World News to get a quick update on the world’s major news stories.

Social Media – Most of the news outlets listed above contribute to Twitter and Facebook. It’s customary for highly condensed announcements in this venue to lead you back to the news outlet’s website for more information. However, how credible tech companies such as Facebook, Twitter, and Google are with news is in serious doubt now that their lawyers have testified to the U.S. Congress that more than 100 million users may have seen content actually created by Russian operatives on the tech companies’ platforms leading up to the 2016 U.S. presidential election. Read more about their testimony at NPR and The New York Times.

Blogs – Sometimes these are good sources for breaking news, as well as commentary on current events and scholarship. Authors who write more objectively elsewhere can share more insights and opinions, more initial questions and findings about a study before they are ready to release definitive data and conclusions about their research.

Citizen Journalism – A growing number of sites cater to those members of the general public who want to report breaking news and submit their own photos and videos on a wide range of topics. The people who do this are often referred to as citizen journalists.

Examples of such sources include CNN iReport, and reddit. For more details on the history and development of citizen journalism, including addressing some of the pros and cons, read Your Guide to Citizen Journalism.

News Feeds – You can get updates on specific topics or a list of major headlines, regularly sent to you
so you don’t have to visit sites or hunt for new content on a topic. Look for links that contain headings such as these to sign up for news feeds:

- RSS feeds
- News Feeds
- News Alerts
- Table of Contents Alerts

**MOVIE: What is an RSS Feed?**

**ACTIVITY: RSS Feeds from Reuters**

Visit [Reuters News RSS Feeds](#) to see a list of general and very specific topic areas for which you can sign up for alerts. What topic interests you? Consider signing up for one (or more).

**ANSWER TO ACTIVITY: Choosing a Newspaper Database**

If you look at the database descriptions, you will notice that the one for Alternative Press Index matches the need expressed in the question.
Data as Sources

Using data as sources can help with all of your research project’s information needs:

- Learn more background information.
- Answer your research question. (The evidence that data provide can help you decide on the best answer for your question.)
- Convince your audience that your answer is correct. (Data often give you evidence that your answer is correct or at least a reasonable answer.)
- Describe the situation surrounding your research question.
- Report what others have said about your research question.

ACTIVITY: Example of Data

Check out this very detailed data about frozen lasagna. Did you ever think this much data was available? Are there elements new to you? How might you use such data?

MOVIE: Reinterpreting Little Red Riding Hood

What is data? The word means many things to many people. (Consider “data” as it relates to your phone contract, for instance!) For our purposes, a definition we like is “units of information observed, collected, or created in the course of research.”


Data observed, collected, or cerated for research purposes can be numbers, text, images, audio clips, and video clips. But in this section on using data as sources, we’re going to concentrate on numerical data.

TIP: From the Latin

Data is the plural of datum. (It’s similar to how media is the plural of medium.)

Sometimes data is actually necessary to answer research questions, particularly in the social sciences.
and life and physical sciences. For instance, data would be necessary to support or rule out these hypotheses:

- More women than men voted in the last presidential election in a majority of states.
- A certain drug shows promising results in the treatment of pancreatic cancer.
- Listening to certain genres of music lowers blood pressure.
- People of certain religious denominations are more likely to find a specific television program objectionable.
- The average weight of house cats in the United States has increased over the past 30 years.
- The average square footage of supermarkets in the United States has increased in the past 20 years.
- More tomatoes were consumed per person in the United Kingdom in 2015 than in 1962.
- Exploding volcanoes can help cool the planet by spewing sulfur dioxide, which combines with water vapor to make reflective aerosols.

So using numeric data in those portions of your final product that require evidence can really strengthen your argument for your answer to your research question. At other times, even if data is not actually necessary, numeric data can be particularly persuasive and sharpen the points you want to make in other portions of your final product devoted to, say, describing the situation surrounding your research question. (See Making an Argument)

For example, for a term paper about the research question “Why is there a gap in the number of people who qualify for food from foodbanks and the number of people who use foodbanks?,” you could find data on the website of Feeding America, the nation’s largest network of foodbanks. Some of that data may be the number of people who get food from a foodbank annually, with the number of seniors and children broken out. Those data won’t answer your research question, but they will help you describe the situation around that question and help your audience develop a fuller understanding.

Similarly, for a project with the research question “How do some birds in Australia use “smart” hunting techniques to flush out prey, including starting fires?,” you might find a journal article with data about how many people have observed these techniques and estimates of how frequently the techniques are used and by how many bird species.

Obtaining Data

There are two ways of obtaining data:

- Obtain data that already has been collected and analyzed. That’s what this section will cover.
- Collect data yourself. This can include activities such as making observations about your environment, conducting surveys or interviews, directly recording measurements in a lab or in the field, or even receiving electronic data recorded by computers/machines that gather the data. You will explore these activities in courses you take.

Finding Data in Articles, Books, Web Pages, and More

Numeric search data can be found all over the place. A lot of it can be found as part of another source-
such as books; journal, newspaper, and magazine articles; and web pages. In these cases, the data do not stand alone as a distinct element, but instead are part of the larger work.

When searching for data in books and articles and on web pages, terms such as statistics or data may or may not be useful search terms. That's because many writers don't use those terms in their scholarly writing. They tend to use the words findings or results when talking about the data that could be useful to you. In addition, statistics is a separate discipline and using that term will turn up lots of journals in that area, which won't be helpful to you. So use the search terms data and statistics with caution, especially when searching library catalogs. (See information on the Library Catalog. More information on searching is at Precision Searching.)

Even without using those search terms, many scholarly sources you turn up are likely to contain data. Once you find potential sources, skim them for tables, graphs, or charts. These items are displays or illustrations of data gathered by researchers. However, sometimes data and interpretations are solely in the body of the narrative text and may be included in sections called “Results” or “Findings.” (That shouldn’t keep you from displaying the data in charts, graphs, or tables as you like in your own work, though. See Data Visualization later in this section.)

If the data you find in a book, article, or web page is particularly helpful and you want more, you could contact the author to request additional numeric research data. Researchers will often discuss their data and its analysis – and sometimes provide some of it (or occasionally, all). Some may link to a larger numeric research data set. However, if a researcher shares his or her data with you, it may be in a raw form. This means that you might have to do additional analysis to make it useful in answering your question.

Depending on your research question, you may need to gather data from multiple sources to get everything you need to answer your research question and make your argument for it. (See Making an Argument.)

For instance, in our example related to foodbanks above, we suggested where you could find statistics about the number of people who get food from American foodbanks. But with that research question (“Why is there a gap in the number of people who qualify for food from foodbanks and the number of people who use foodbanks?”), you would also need to find out from another source how many people qualify for foodbanks based on their income and compare that number with how many people actually use foodbanks.

Finding Data, Data Depositories, and Directories

Sometimes the numeric research data you need may not be in the articles, books, and web sites that you’ve found. But that doesn’t mean that it hasn’t been collected and packaged in a useable format. Governments and research institutions often publish data they have collected in discipline-specific data depositories that make data available online. Here are some examples:

- United States Census Bureau
- Budget of the United States Government
- U.S. Bureau of Justice Statistics
- National Center for Education Statistics
- Daily Weather Maps NOAA)
The United Nations and just about every country provide information as numeric data available online. Free and accessible data like this is called open data. The U.S. federal government, all states, and many local governments provide open data. You can find them (among other places) at site: .gov.

Other data are available through vendors who publish the data collected by researchers. Here are some examples:

- Hoover's Online (OSU Only)
- International Monetary Fund Statistical Databases
- World Health Organization Statistical Information System
- Envirofacts
- Census of Agriculture (OSU only)
- OECD Education at a Glance
- Corruption Perceptions Index

Don't know if a depository that could contain data in your discipline? Check out a data directory such as re3data.org

**ACTIVITY: Where to Find Data**

Open activity in a web browser.

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**Evaluating Data as Sources**

Evaluating data for relevance and credibility is just as important as evaluating any other source. Another thing that is the same with data is that there is never a 100% perfect source. So just as is pointed out in Evaluating Sources, you'll have to make educated guesses (inferences) about whether the data are good enough for your purpose.

Critical thinking as you evaluate sources is something your professors will expect. But you'll benefit in other ways, too, because you'll be practicing a skill necessary for the rest of your life, both in the workplace and in your personal life. It's those skills that will keep you from being duped by fake news and taken advantage by posts that are ignorant or, sometimes, simply scams.

To evaluate data, you'll need to find out how the data were collected. If the data are in another source, such as a book; web page; or newspaper, magazine, or research journal article, evaluate that source in the usual way (see Evaluating Sources). If the book or newspaper, magazine, or web page got the data from somewhere else, do the same evaluation of the source from which the book or article got the data. The article, book, or web page should cite where the data came from. If it doesn't, then that is a black mark against using that data. (The data in a research journal article are often the work of the authors of the article. But you'll want to be sure they provide information about how they collected the data.)
In addition, if the data are in a research journal article, read the entire article, including the section called Methodology, which tells how the data were collected. Then determine the data’s relevance to your research question by considering such questions as:

- Were the data collected recently enough?
- Is the data cross-sectional (based on information from people at any one time) or longitudinal (based on information from the same people over time)? If one is more appropriate for your research question than the other, is there information that you can still logically infer from this data?
- Were the types of people from whom the data were collected the same type of people your research question addresses? The more representative the study’s sample is of the group your research question addresses, the more confident you can be in using the data to make your argument in your final product.
- Was the data analysis done at the right level for your research question? For instance, it may have been done at the individual, family, business, state, or zip code level. But if that doesn’t relate to your research question, can you still logically make inferences that will help your argument? Here’s an example: Imagine that your research question asks whether participation in high school sports in Columbus City Schools is positively associated with enrolling in college. But the data you are evaluating is analyzed at the state level. So you have data about the whole state of Ohio’s schools and not Columbus in particular. In this case, ask yourself whether there is still any inference you can make from the data.

Research articles are sometimes difficult to read until you get used to them. Here’s a helpful PDF: https://violentmetaphors.files.wordpress.com/2018/01/how-to-read-and-understand-a-scientific-article.pdfTo evaluate the credibility of the data in a research journal article you have already read, take the steps recommended in Evaluating Sources, plus consider these questions:

- Is the article in a peer reviewed journal? (Look at the journal’s instructions for authors, which are often located on the journal’s website, to see if it talks about peers reviewing the article and asking for changes [revisions] before publishing.) If it is a peer reviewed journal, consider that a plus for the article’s credibility. Being peer reviewed doesn’t mean it’s perfect; just more likely to be credible.
- Do the authors discuss causation or correlation? Be wary of claims of causation; it is very difficult to determine a causal effect. While research studies often find relationships (correlation) between various variables in the data, this does not equal causation. For instance, let’s return to our example above: If the study of Ohio high schools students’ sports participation showed a positive correlation between sports participation and college enrollment, the researcher cannot say that participation caused college enrollment. If it were designed to show cause and effect, the study would not have resulted in a correlation. Instead, it would have had to have been designed as an experiment or quasi-experiment, used different statistical analyses, and would have supported or not supported its hypotheses.
ACTIVITY: Evaluating Data as Sources

Open activity in a web browser.

Data Visualization

Modern software can help you display your data in ways that are striking and often even beautiful. But the best criterion for judging whatever display you use is whether it helps you and your audience understand your data better than only text, maybe even noticing points that you would have otherwise missed.

Specific kinds of charts and graphs accomplish different things, which is important to keep in mind as you evaluate data and data sources. For instance:

- Line charts are usually used to show trends, comparing data over time.
- Scatter plots show the distribution of data points.
- Bar graphs usually compare categories of data.
- Pie charts show proportions of a whole.

It’s important to decide what you want a display to do before making your final choice. Studying your data first so you know what you have will help you make that decision. Also, it may also be conventional in your discipline to display your data in certain ways. Examining the sources you were assigned to read in your course or asking your professor will help you learn what’s considered conventional.

Your professors will be examining your visual display to make sure you did not misrepresent the data. For example, the proportions of slices in a pie chart all have to add up to 100%. If yours don’t, you’ve done something wrong.

It’s easy to get overwhelmed by all the choices to be made between potential displays and what each can do: Here are two sites to help you sort them out once you know your data:

http://datavizproject.com/

https://datavizcatalogue.com/

If you aren’t ready yet to use some of the specialized tools for display, make it a point to learn how to use the data display capabilities in Microsoft Word and/or Excel. You can find helpful tutorials on the Web. Good search statements to find those tutorials are:

- “Microsoft Word” (charts OR graphs)
- “Microsoft Excel” (charts OR graphs).

If you are OSU staff, students, or faculty, OSU Libraries’ Research Commons can help you choose a display, recommend a tool to accomplish it, and check out your finished data visualization before you have to turn it in. Contact the data visualization specialist.

If you are interested in displaying geospatial data on a map, consider how the Research Commons also helps OSU students, staff, and faculty find geospatial data and choose tools to display them.
Citing Data

Data is not copyrightable, but the expression of data is. So as with any other information source, you should cite any data you use from a source, whether it appeared in an article or you downloaded the data from a repository on the Web.

Unfortunately, data citation standards do not exist in many disciplines, although the DataCite initiative is working on them. Current workarounds include:

- Citing a “data paper,” where available.
- Citing a journal article that describes the dataset.
- Citing a book that includes the data.
- Citing the dataset as a website, where possible.

**EXAMPLES: Citing Data**

Data from a research database:


Data from a file found on the open Web:


Proper Use of Data

Once you have your data, you can examine them and make an interpretation. Sometimes, you can do so easily. But not always.

*What if...*

...*you had a lot of information?* Sometimes data can be very complicated and may include thousands (or millions...or billions...or more!) of data points. Suppose you only have a date and the high temperature...
for Columbus – but you have this for 20 years’ worth of days. Do you want to calculate the average highs for each month based upon 20 years’ worth of data by hand or even with a calculator?

...you want to be able to prove a relationship? Perhaps your theory is that social sciences students do better in a certain class than arts and humanities or life and physical science students. You may have a huge spreadsheet of data from 20 years’ worth of this course’s sections and would need to use statistical methods to see if a relationship between major and course grade exist.

You may find yourself using special software, such as Excel, SAS, and SPSS, in such situations.

Many people may have a tendency to look for data to prove their hypothesis or idea, as opposed to really answering their research questions. However, you may find that the opposite happens: the data may actually disprove your hypothesis. You should never try to manipulate data so that it gives credence to your desired outcome. While it may not be the answer you wanted to find, it is the answer that exists. You may, of course, look for other sources of data – perhaps there are multiple sources of data for the same topic with differing results. Inconclusive or conflicting findings do happen and can be the answer (even if it’s not the one you wanted!).

Conflicting results on the same topic are common. This is the reality of research because, after all, the questions researchers are studying are complicated. When you have conflicting results you can’t just ignore the differences—you’ll have to do your best to explain why the differences occurred.
People as Sources

People don’t just create the sources we use. They are actually sources them-selves. Most of us use people as sources all the time in our private lives, such when we ask a friend for a restaurant recommendation or ask whether a movie is worth watching. But you probably aren’t using people as sources very often in your assignments—unless you are a journalism major, of course.

In fact, research indicates that employers such as Battelle, Nationwide Insurance, Microsoft, the FBI, the Smithsonian, the Port of Los Angeles, SS&G Financial Services, and Marriott International have been dissatisfied with their new hires’ inability to gather information by talking with real people. They’ve found new hires unwilling or unprepared to ask the experienced employee down the hall or the expert across town for information to solve a problem. For instance, the study linked to above quotes one employer as saying about new hires:

*Here’s something we’re targeting in interviews now—the big thing is they believe the computer is their workspace, so basic interactions between people are lost. They won’t get up and walk over and ask someone a question. They are less comfortable and have some lack of willingness to use people as sources and also have a lack of awareness that people are a valid source of information...*

So getting some experience using people as sources is likely to help you not just with a current research assignment but with your work in the future.

**Important: Who’s an “Expert”?**

Experts aren’t only researchers with Ph.D.s doing academic work. The question when trying to decide who can be a source is really always, who can speak with authority about any part of the subject? And the answer to that question is always contextual, a kind of “it depends.”

People can speak with authority for different reasons. According to the framework for information literacy, they can have subject expertise (say, having done scholarship in the field), societal position (maybe a public office or other relevant work title), or special experience (say, living or working in a particular situation of interest or having participated in an historical event).

For instance, people who have had firsthand experience living or working with a situation (say, a survivor of school shooting if your topic is on that subject) you are studying can have a unique perspective unavailable elsewhere. And it’s that up-close, firsthand view of the situation that gives them the authority that you and your audience respond to.

Of course, such sources have to be evaluated just like any other. Could they be biased? Like any source, yes. We just have to keep that possible bias in mind as we use the information from such a source. That’s part of exercising the critical thinking that research assignments are famous for producing.

Potentially biased or not, sometimes a source’s firsthand experience can’t be beat. And recognizing what they offer can help us open up to diverse ideas and worldviews that we would otherwise miss. Don’t be surprised if this kind of source takes you off in completely new directions with your assignment, ones
Research Question | Potential Person as Source | Potential Person as Source
--- | --- | ---
How are tools originally developed for medicine, geology, and manufacturing used to explore paintings and sculptures? | An art conservator who uses those tools that you read about in the newspaper or other source | The person who invented one of the tools on the floor of the factory where he works
Why do most people who qualify for food at foodbanks not ask for food? | A local food bank director | A person (perhaps a fellow student) who qualifies but does not ask for food at a food bank
How and why do city and county governments brand themselves? | An official in such a city or county who has been involved in branding decisions | The director of a company that designs branding for cities and counties

that turn out to be much more interesting than those you were following before. For many researchers, finding sources that really open up a topic like that is one of the most rewarding—and fun—things about doing research.

Some Examples of People as Sources

You can interview a person as a source on the phone, in email, with Skype, or face-to-face. You’ll need to:

- Pay attention when reading other sources so you can identify whom to contact and know what they could have to offer.
- Prepare by learning enough about your topic so you can ask appropriate questions, know what your expert has done in relation to that topic so you don’t seem ignorant of their contribution, and know how to contact them. You might also want to do a practice interview with a friend.
- Contact your source to see if they are willing to talk with you and when that would be convenient. Then follow through.

Use good interview techniques, such as trying to put them at ease, using active listening techniques to encourage them to talk, asking follow up questions, and thanking them at the end of the interview.

**TIP: How to identify researchers at OSU to interview.**

1. Search the database Scopus for your topic. Once you have some results, use the Affiliation option among Define Results options on the left to limit your search to Ohio State University. You may also want to limit by the Year option.
2. Pull up relevant articles’ records in Scopus (you can sort by times cited) and then identify which of the authors were at the time at OSU. (Articles may have multiple authors—sometimes over a dozen or more if they are in science).
3. Go to Find People (on the OSU navigation bar on all OSU pages) and search for the OSU person’s name to see if they’re still at OSU and get their contact information. In many
cases, they will still be at OSU, especially for fairly recent articles, because OSU updates author profiles regularly. Note that researchers may or may not be faculty—some may be staff or even students.

**Citing People as Sources**

Like other sources, people should be cited in your research final product, depending on the citation style you’re using. For instance, in APA style, interviews, e-mail, and other personal communication should not appear in the reference list but should be in your main text only like this: (A. Authorslastname, personal communication, July 29, 2018).

See [Purdue Online Writing Lab (OWL)](https://owl.purdue.edu) for information on how to handle interviews and other communication with people in other styles.

**ACTIVITY: People as Sources**

Open activity in a Web browser