



PARENTS PACK

MONTHLY UPDATES ABOUT
VACCINES ACROSS THE LIFESPAN

FEATURE ARTICLE — GOING TO THE SOURCE: FINDING OUT MORE ABOUT A MESSAGE THAT INCLUDES SCIENCE

November 2024

The internet and smartphones have made it easy for people to access information, including scientific studies. Scientific studies are considered “primary sources,” meaning they are the original source of the information.

Most people have never had coursework that introduced them to this body of literature. More often, people are introduced to scientific findings through “secondary sources,” meaning sources that present a summarized version or high-level understanding of the topic being discussed. Some examples of secondary sources include:

- **Media reports**, which typically summarize a single new study in a few sentences.
- **Science-based publications**, like *Scientific American*; **websites**; and **museum exhibits**, which are designed for the public and offer more detail than most media reports.
- **Textbooks**, such as those used in classrooms, which summarize whole bodies of scientific literature in a few sentences, paragraphs or chapters.

While these resources are important for providing information about scientific findings to large swaths of people, increasingly, individuals who want to know more about a topic can directly access primary sources. But not all primary sources are created equal, so we thought this month, we would describe how scientists approach publishing their findings to provide a context for evaluating primary sources that may be available to the public at large, especially since some who spread inaccurate information use primary sources as one of their tools of deception.

When a scientist publishes their data

When scientists want to publish their data, they turn to scientific journals. First, they need to decide the journal to which they will submit their work, knowing that not all journals are equally valued. Only rare journals, like *Science* and *Nature*, publish articles on all scientific topics. Because these journals are prestigious and have large audiences, most scientists never have the privilege of publishing in them.

Instead, different areas of science have journals that scientists working in a particular field follow. For example, scientists doing vaccine research monitor journals that publish articles about vaccines, infectious diseases and immunology. Some prominent examples include *Vaccine* and the *Journal of Infectious Diseases*. Healthcare providers are most likely to follow journals that publish articles related to clinical care, like *Pediatrics* and *The New England Journal of Medicine*. Finally, some journals focus on specific groups, such as the *Journal of School Health* and the *Journal of American College Health*.

Most scientists have a sense of the importance of their data within the field and consider who will be most interested in their findings. As such, they consider the focus of a journal (the topics), who typically reads it (the audience), and what types of articles the journal publishes. To get more information about a journal, potential authors often review the journal’s website.

If you are reading or wondering about a scientific study, finding out more about the journal is a good place for you to start as well. Find out what journal published the study and then check its website to see what is required to get a study published. Check out these examples to see what to look for in the guidance for authors: *Science* | *Vaccine*.

Additional considerations:

- Anyone can publish a scientific study. If it is a well-designed study and it contributes to what we know about how the world works, it can be submitted and potentially accepted for publication.
- One of the most important factors related to scientific publication is the peer review process. So, when you review a journal’s website, look at whether peer review is part of the publication process.
- Sometimes journals will publish without peer review; instead, they ask authors to pay for publication. While good studies can be published in these journals on occasion, most often a scientist is going to try to get published in a peer-reviewed journal because if they always publish in journals that use a pay-to-publish model, it will reflect negatively on their credentials as other scientists will anticipate that their work is not of high enough quality to survive the peer review process. Check out this page on the Weill Cornell Medicine Samuel J. Wood Library (Cornell) website to learn more about what they term “predatory journals” and the flags to watch for.

TRIVIA CORNER

What famous author nearly died after intentionally exposing himself to a friend who had measles?

- A. Mark Twain
- B. Ralph Waldo Emerson
- C. Walt Whitman
- D. Margaret Fuller

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Other quality factors of a journal

In addition to understanding whether the journal has a peer review or pay-to-publish process, the quality of a journal can be assessed by other factors as well:

1. **Impact factor** — The impact factor is a number that represents how often other scientists reference papers from the journal in their own papers. Typically, the higher the number, the better the journal because it means more scientists are reading the journal and finding the published articles to be of value to their own work. A few different impact factor systems are used, so this number can not be viewed in isolation to evaluate how good a journal (or the study published in it) is.

In addition, bad studies are sometimes published in good journals and vice versa. One example is the Wakefield paper that hypothesized a causal relationship between receipt of the MMR vaccine and development of autism. That paper was published in *The Lancet*, a well-respected journal from the United Kingdom; however, the paper was later retracted. Find out more about the issues with that paper in the “The Wakefield Studies: The first study” section on the “Vaccines and Autism” page of our website.

2. **Indexing** — We are all familiar with how search results often put the most popular articles at the top of our “Google” results, and a similar factor can be used for assessing journal quality. When scientists are looking for relevant articles, instead of going to “Google,” they use specific databases. When it comes to papers related to medicine, such as vaccines, databases they may use include PubMed or MedLine, among others. The more databases that index a journal, the better the journal is considered. You can view a variety of databases on the “Electronic Databases & Directories: Alphabetical List” page of the National Institutes of Health (NIH) website.
3. **Several other factors**, such as how long the journal has been published, who is on the editorial board, who publishes the journal, and what percentage of submitted papers are accepted, can also help you evaluate the quality of a journal. Check out the “Deciding Where to Publish” page on the Cornell website for more information.

Since we just mentioned that sometimes bad studies can end up in good journals, the next step after evaluating where a study was published is to evaluate the quality of the study. How to read a scientific study is beyond the scope of this article, but you can find more about that topic in the Unbiased Science article, “From Abstract to Discussion: A Primer on Reading Scientific Papers.”

In Sum: Using primary sources as tools of deception

Most people will not have the time for (or interest in) evaluating the quality of a message that arrives in their social media feed — and those who intentionally spread inaccurate information, called disinformation, know that!

For this reason, it is important to approach any messages (especially those that evoke strong emotion) as potentially misleading, knowing that some bad actors use primary data to sound like what they are saying has been proven scientifically. They typically do this in the two ways alluded to above. Specifically, they:

1. Publish poorly constructed studies in journals that make it easy to publish.
2. Misinterpret studies that are well constructed, but which don't prove what they are suggesting.

So, if you don't feel like tracking down the journal and reviewing the study using the information provided above, consider some of these shortcuts for evaluating the information that is in your social media feed before sharing it:

- Try to figure out who generated the information (not who sent it to you, but who first disseminated it).
- Before sharing it, go out of social media and do an online search to see what others are saying about the study. This is called lateral searching.
- If you aren't sure about a post (or don't have time to evaluate it for accuracy), resist the urge to share it.

For these and other tips about evaluating information, check our Parents PACK website section, “Evaluating Information.” Consider bookmarking this section of our website, so you have it at your fingertips. And remember, the more often you review information with healthy skepticism, the more efficient you will become at identifying inaccurate information — and contributing to stopping its spread.

For links to resources in this article, please visit bit.ly/nov2024FA.

DR. HANDY'S CORNER: WHY DO WE SEE MEASLES OUTBREAKS?

Dr. Lori Handy recommends that you speak with your healthcare provider or travel clinic sooner rather than later regarding vaccines or medications important for your travel destination no matter the season, bit.ly/vax-travel.

NEWS & NOTES

Vist the online article (bit.ly/nov2024NN) for these headlines:

- Kindergarteners are less protected from infectious diseases than in previous years
- Questions about vaccine safety? Check out our updated booklet.

TRIVIA ANSWER

The correct answer is A. When Mark Twain was 12 years old, a measles epidemic swept through his town. Feeling like a prisoner in his own house, he decided to visit his friend who was sick with measles. Mark Twain wrote about this experience in “The Turning-Point of My Life.”

Go to vaccine.chop.edu/trivia to play Just the Vax, the Vaccine Education Center's trivia game, where you can find this question and others like it.

