

## The Rhetoric of Science

### Science is rhetorical.

That statement may go against all that you ever learned about science being about facts, observation, and objectivity—not about discovery of “the most available means of persuasion,” as Aristotle defined rhetoric.

However, if you think about it, the methods of science and other related fields, such as technology, engineering, and mathematics (STEM), distill down to arguments, assumptions, perspectives, and knowledge. In other words, they *are* or *become* rhetoric.

Before we delve into what we mean by science being rhetorical, though, let’s review Aristotle’s rhetorical appeals and genres and take a look at arrangements of arguments and ideas, too, in this video below:

Now, we return to our earlier statement about science being rhetorical. What does that mean exactly? Well, science is rhetorical because...

**1. Rhetoric shapes knowledge, and knowledge shapes us.** Think of the history of science and of scientific communication. Specifically, consider Isaac Newton’s [missive to Robert Hooke](#) that if he could see further, it was from standing “on the shoulders of giants.”

In this case, Newton seems to refer to earlier discoveries, found in the works of great thinkers, such as Copernicus, Galileo, and Kepler. You see; their knowledge, realized in the rhetorical prose of books, helped shape Newton’s own theories.

Likewise, Newton’s knowledge published in his own rhetorical prose—his *Mathematical Principles of Natural Philosophy*, for example—would shape the minds of physicists for generations to come. Overall, because language and ideas are so intertwined, rhetoric is considered epistemic (Scott, 1967)—meaning it creates knowledge—which certainly is important to shaping the future work and communication of scientists.

**2. Rhetoric is situated.** As we learned with discourse communities, each of us is part of one, two, or even multiple groups that share rhetorical tools and technologies, languages and vocabularies, and participate ongoing issues and discussions; and these elements differ based on the situation or context, hence the community of like-minded people is formed and sometimes even fractured. This situated-ness coincides with the ancient idea of *kairos* or “right timing and due measure.” ([Watch this video](#) to learn more about *kairos*).

With these ideas in mind, scientists are a discourse group themselves, and their scientific situations or contexts—whether making formulas in a lab, observing out in the field, or discussing results at a conference table—work to “induce” belief, as science historian, [Thomas Kuhn \(2014\), argues](#). That is, “[t]ruth is not necessarily self-evident; it has to be argued for, and in fact it emerges only through discussion and debate, in which arguments often embody fundamental values and agreements of a community” (Ornatowski, 2007, p. 8).

**3. Rhetoric defines a genre.** You may have seen Jimmy Fallon’s [Random Genre Generator](#) challenges over the years, where he and a musical guest each push the button and are forced to sing a popular song in a different genre. For instance, Fallon sings “Dance Monkey” in Frank Sinatra Crooner style, and in my humble opinion, makes that song much more tolerable. Side note: if you want to check out a really cool site about the distribution of music genres, see [Every Noise at Once](#).

I say all that to say that genres aren’t just for music or films (e.g., rom-coms or thrillers), they are for categorizing writing, too—especially scholarly writing.

Remember in the video, above, on Aristotle’s rhetoric, where we learned about ethos, pathos, and logos as the three appeals to character, emotion, and reason, respectively? You may also recall that Aristotle identified [three](#)

[branches or genres](#) of rhetoric: deliberative or legislative, judicial or forensic, and epideictic or ceremonial rhetoric.

All that said, there are rhetorical genres that run through how scientific research is formed, calculated, and spilt out on a page. Take the APA journal article, for example. Scientists often use what we call the [IMRaD format](#); that is, authors will often publish their reports with sections titled Introduction, Methods, Results (and), Discussion.

As Fahnestock (1998) argues, this genre, or branch, of scientific writing is what Aristotle referred to as forensic or judicial rhetoric; that is, it's investigative and looks to the past for its content. However, if you take the information from a scientific journal article and put in a popular science magazine, like *Smithsonian*, then Fahnestock (1998) says it turns into epideictic rhetoric, because it then moves the genre to the present and praises the content, so to speak. *Note: you will want to understand the genres of forensic, deliberative, and epideictic rhetoric for your major essay assignment.* Watch [this video](#) for full understanding.

Altogether, rhetoric shapes knowledge, and knowledge shapes science. Additionally, rhetoric works within the interstices of time and place to form a linguistic situatedness conducive to the many contexts, discoveries, and revolutions in the scientific world. Finally, rhetoric forms genres that define the written scientific knowledge that bring uniformity to the multi-layered and often messy process of scientific observation and discovery. Rhetoric collectively works to introduce *and* induce scientists to new ideas and theories; and likewise, science brings novelty to rhetoric.

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