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Additional Reading

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♦ The Media and Communicating Science to the Public

Scientists and science reporters have a common goal: We both want the public to read stories about science. But our reasons for seeking this goal and the way we go about it are drastically different.

Scientists argue that if a society is to progress, it must support scientific research and such support will come only if the public understands the nature of science. Thus, they say, for its own good the public should understand science. They should know that science has its limitations as well as its promises, that scientific answers to questions do not come easily and are not always unambiguous but are part of the endless human quest to comprehend the surrounding universe.

In short, scientists can define what they believe the public *should* know about science.

Those in the mass media, however, are faced with the problem of trying to fathom what their readers (or viewers) *want* to know about science, rather than whether they *should* know it.

When scientists try to enlist the mass media as partners in achieving the "public understanding of science", they seem to assume that the scientific process is so fascinating that all the reporters have to do is describe an experiment or a scientific finding in lay terms and readers immediately will be so engrossed they will read the story down to the last word.

This assumption may be correct for a small portion of the public, those who buy *Discover* magazine, *Scientific American* or even *National Geographic*, for instance, or those who make an overt effort to buy the Tuesday issue of the *New York Times* with its "Science Times" section. But anyone who assumes the audience for science news is any larger will be frustrated in any attempt to communicate science to the general public.

The reality is that the vast majority of the public cares very little about science, will spend little or no time trying to learn about science, and even will be bored reading or hearing about it.

If people bought newspapers in order to learn about science, then newspapers would devote as much space to science as they do to sports or the stock market. Instead, newspaper readers are notoriously fickle. They will flip through their newspapers each morning to get the scores of last night's ball games, to check the prices of their stocks, to see what the department stores have on sale, to find out who got married or died, to get the crossword puzzle, and to see if there are any murderers or robbers in the vicinity who might endanger their own well-being. If during their perusal each morning readers spot a headline that indicates there's been some development in science that seems interesting, they will stop and read the 1st few sentences. If the 1st few sentences continue to interest them, they will continue to read the story.

The science reporter's assignment isn't to educate the public about science or even to "cover" science; it is to monitor the scientific world for any developments that may be of interest to readers. The criterion for selecting a news story is what's important to the readers, not the scientists. Science reporters frequently forego writing stories about discoveries and results that may be scientifically significant in favor of writing about some relatively trivial development simply because the more significant development is unlikely to attract the interest of the lay reader. Editors know that if a science story, even one that presents the most significant science in the most understandable lay language, isn't read, the reporter has wasted time and the newspaper has wasted space. It is also quite clear to them that if the newspaper prints too many unread stories it soon will find its readers going elsewhere for the news they want.

An example of this dichotomy in communicating science to the public was illustrated not long ago by an article in the *Journal of the American Medical Association (JAMA)*. In 1990 *JAMA* published 2 epidemiologic studies pertaining to the risks of exposure to low-level nuclear radiation. One study found a slightly increased risk of leukemia among atomic industrial workers, while the other found no evidence of increased cancer risk among populations living near nuclear power plants.

Several months later *JAMA* carried a study of the media coverage of the 2 epidemiologic reports (1), which found that coverage of the reports was biased. Most newspapers stories emphasized the "positive" finding of a leukemia risk and played

down or even totally ignored the "negative" finding of no risk to neighbors of nuclear plants.

"Responsible journalists should acknowledge the importance of providing balanced information to the public when covering controversial health issues and should give equal attention to positive and negative studies," the authors of the media study wrote.

The 2 *JAMA* authors seemed to assume that if the newspapers had carried "balanced" stories, the stories would have been read and the readers would have gained information they needed to know to gage the risks of low-level radiation. Editors thought otherwise. Such balanced reporting might be a laudable goal, but it is bad news judgment.

Many editors looking at the 2 studies knew that none of their readers lived near a nuclear power plant and weren't the least bit concerned about whether there was a risk of doing so. In other words, the finding was irrelevant to the lives of readers, and few if any would have read a story about it. On the other hand, most readers probably have had medical or dental radiographs and may have wondered if this low-level radiation posed any risk. A finding that exposure to low-level radiation poses a small risk to at least 1 group of humans would be of interest.

The newspaper editors also know that the moment readers hit a sentence or two that is uninteresting they are likely to stop reading the story and turn the page looking for something more intriguing to occupy their time. Thus, if the no-risk finding were put at the beginning of the story, many readers would have either skipped the story altogether or given up reading it after the 1st couple of paragraphs. If the no-risk find were included in the story, it would be placed toward the end. News stories are constructed in the so-called inverted pyramid style with the most important—to the reader—information at the top and the least important at the bottom.

Newspapers often cannot afford to print what scientists or others consider to be balanced, complete articles or articles that set new scientific findings in the "proper" context. It's hoped that the stories won't mislead the readers and will at least give them enough information to allow them to make further inquiries on their own if they so desire.

To many scientists the headlines and the leads are the most contentious elements of science reporting. Those scientists whose research becomes the subjects of news stories often complain, usually with some anger, that the headlines and leads were "grossly misleading" if not "sensational". Their charges often are justified. Years ago, when lasers were being first tested for medical uses, 1 newspaper carried a banner headline across the top of its front page, "Light Beam Cures Cancer". The story was about a laser beam demolishing a human tumor transplanted to the cheek pouch of a hamster, hardly a cure and almost totally irrelevant to human cancer.

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But to most science reporters and editors, the headline and the 1st sentence of the story—the "lead"—are the most crucial elements, for they must quickly seduce readers into reading further. Since most readers are not scientifically oriented and cannot deduce on their own why a new scientific development is relevant to their lives, the reporter must emphasize the relevance to the reader within the first 2 or 3 sentences. The reporter must tell the readers almost immediately why they should be interested in this development and why they should read further.

For this reason science reporters often spend inordinate amounts of time composing the 1st few sentences of a story in hopes of finding an effective and perhaps novel way of grabbing the reader's fancy. The product of this effort may well ignore or "play down" the scientific significance of the development in favor of some facet that is more relevant to the reader. Recently, for example, the Pentagon announced that Earth-based radar probes of the lunar surface had detected hints of water ice inside a large crater. The finding might alter current scientific knowledge of the history and the climate of the Moon. But in trying to seduce readers into reading the story, most reporters began their stories stating that a permanent human station on the Moon might be more feasible now that there seems to be a local source of water. The reporters knew that the possibility of human habitations in space had become familiar to most people through the movies and television and felt this approach would have more appeal than one that said the finding supported theories that comets had deposited water ice on the Moon in past eons.

Perhaps I've made editors and reporters for the mass media sound more crass than they actually are. In their coverage of science, they are guided by more than just the desire to sell newspapers or gain viewers. They fully realize that readers or viewers who are attracted to their stories and who read them are learning about science. Fortunately, most scientists also realize that such coverage, despite its limitations, is educational. Scientists and reporters who, years ago, approached each other with wariness and skepticism now find themselves working side by side in communicating science to the public.

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