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INTERVIEW WITH SUSANNA PRIEST

Entrevista a Susanna Priest

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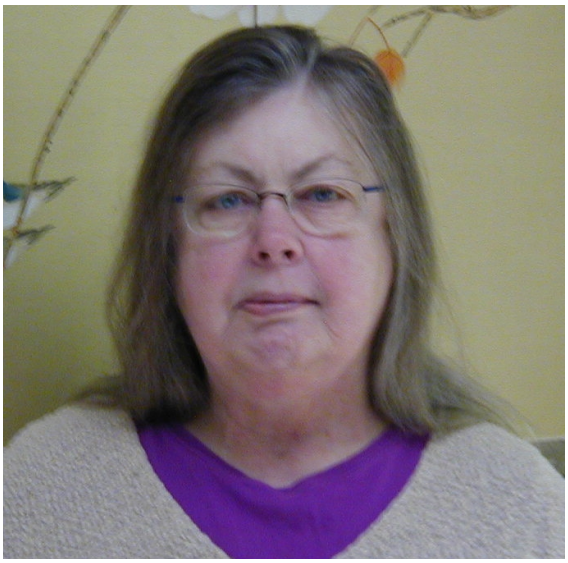
For a 'critical science literacy'



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Susanna Priest is a visiting Scholar at the University of Washington (United States), from which she obtained her Ph.D. in 1989. Priest is the editor of *Science Communication: Linking Theory and Practice* and compiled the *Encyclopedia of Science Communication*, both published by Sage. Priest has developed academic programs in science communication at Texas A&M University and George Mason University. She has also taught at the University of South Carolina and the University of Nevada, Las Vegas.

She has also written books on communication issues surrounding emerging technologies such as *A grain of truth: the media, the public, and biotechnology* and *Nanotechnology and the Public: Risk Perception and Risk Communication*. Most recently she is working on a book about climate change communication. She has authored or co-authored about 60 articles and book chapters, most of them concerning science communication and related issues of audience. In recent work, Priest had been advocating for recognition of the concept of "critical science literacy" to complement the older "science literacy" concept. According to her, "critical science literacy" means the critical thinking skills required to understand the social and political character of science, to distinguish among forms of expertise, to recognize the nature of scientific consensus, and other crucial skills citizens and journalists needs to make sense out of messages and arguments about science. She believes that as the Information Age continues to unfold and old patterns of authority are shifting, these skills are more important than ever. In this interview, Susanna Priest talks to Luisa Massarani, invited editor of this issue.

You have been working in science communication research since 1989. In your view, are there changes in the field since you started working on it in comparison to the present moment?

Things have changed quite a bit, actually. I think that we have a much better sense of our community as a networked group of researchers and practitioners embodied in groups like PCST [PCST Network, the International Network on Public Communication of Science and Technology][1] but also within the various communication organizations and science studies organizations, among others, worldwide.

Of course, there are people working in this area (as well as others with related interests throughout the scientific community) who are largely unaware of the broader community – unfortunately this leads to a lot of "reinventing the wheel" among individuals who are not aware of all the work that's been done. This is one key role of journals like *Science Communication* and *Public Understanding of Science*, by the way – to make people aware of us as a connected group of researchers, as a community of scholars rather than merely isolated individuals.

Our research has gotten much better as well – much more sophisticated. Sometimes I think this leads to a little bit of frustration to those just coming on board, but our methods and concepts are really quite advanced compared to what they were in the 1980s when I started working in this area. To me, the field remains exciting because despite this growing sophistication, we've remained eclectic, embracing qualitative and quantitative work, historical and critical studies springing from humanities traditions as well as empirical social science in the narrower sense. This means there is always something new to think about, not to mention the constant change within science itself!

One other big change is that "science communication" no longer refers only to one-way, usually mediated, communication. Both in research and in practice, public engagement events such as science cafés and festivals, all kinds of outreach activities at the local level, the interpersonal discussions that take place about science, and the activities and exhibits at museums and science centers are all recognized forms of science communication. So is communication within the scientific community, as well as that involving both scientists and people who are not scientists.

[1] The International Network on Public Communication of Science and Technology (PCST) network is a network of individuals from around the world who are active in producing and studying PCST.

Finally, of course, the Internet has changed everything, making us all active information seekers, not just passive recipients of mediated messages, with a wealth of options to choose from.

We proposed this special issue on "Science communication and audiences" because, after our reviews of the literature, we found only few initiatives. There are several initiatives on audiences and TV and other mass media, but it seems to exist a gap when we refer to audiences and science communication. The few initiatives we found were in several cases dedicated to specific products, for example trying to evaluate a movie or a TV programme. Do you agree with this view?

I think there is a gap, and there are at least two big reasons for it. The first is that I think the field of science communication really grew out of science journalism studies to a certain extent. Certainly in the United States this was true. Combined with the existence of truly "mass" media in a sense that first cable TV and now the Internet have now truly eroded, historically there wasn't much unpacking of the audience. Rather, the old "mass audience" associated with studies of "mass society" in the days when only a few television networks ruled the airwaves and computers had not yet been reconceptualized as communication devices persisted to influence our thinking.

The broader conception of science communication as described above, and particularly the existence of the Internet and other new, more interactive electronic media such as videogames and computer-generated simulations of natural phenomena, really challenged our ideas about who the audiences are by breaking down the old "mass audience," "general public" idea.

I also think that in earlier decades science journalists – again, an important part of where this all began, in some ways – tended to write for those who were especially interested in science, and who have a fair amount of background knowledge about it. This is just the same as "foreign affairs" journalists who write for those who already understand and appreciate the complexity of global politics, or political journalists who write for those with a lot of "insider" knowledge of the political scene. Sometimes this is not so useful for those who aren't members of one of these elite groups.

As the old notion of a "mass audience" has broken down, we're more aware of the variations among us. Especially in pluralistic societies like the U.S. and Brazil, religious and ethnic

variation exists alongside differences in educational levels. We can no longer pretend there is a single audience for anything!

In an article you wrote (Priest, 2009) you said that new developments in science and technology – such as modification of organisms, or the conduct of stem cell research – challenge traditional social values, in somewhat different ways in different cultures. And, as you highlight, the concept of a 'mass' audience that will react in a largely uniform and predictable way to 'mass' messages has been largely discarded by media researchers and by practical professionals. In your book *A grain of truth: the media, the public, and biotechnology* (Priest, 2001) you addressed the issue on the United States context. In your view, in which sense the fact that these new science developments challenge traditional social values can (or not) change the approaches and strategies for communicating science?

To some extent I think I've anticipated this question in what I've said earlier in this interview. We really need to make science available and accessible to different audiences, but without trampling all over the legitimate variations in values that exist. For myself, I think learning a little bit about the feminist critique of science and the way that "masculine" values have been said to creep into science was an early lesson in how science and values are intimately intertwined. One of the associate editors, Cynthia Coleman, studies Native American and other "non-Western" worldviews in relationship to the "Western" concept of science, differences in values and beliefs that still create clashes.

If we want to communicate effectively about important topics like vaccination or climate change, we have to think long and hard about why some audiences reject vaccination or don't believe in climate change. This doesn't mean we necessarily agree with them, but we should try to understand their perspectives. This is an ethical issue; it's also a way to make science communication more effective.

Sometimes science cannot readily be reconciled with other forms of knowing or believing. Large numbers of people in the American South, where I taught for many years, do not believe in evolution. Yet the country was founded on the basis of religious tolerance, and I do not believe we can – or should – dismiss religious audiences. Similarly, Catholics reject embryonic stem cell research. While I personally believe it is very important to continue this research, we ought to seek ways to do this that are as respectful as possible of those who disagree. Otherwise we are

just exacerbating what is sometimes seen as a conflict between science and religion. There usually is not a conflict, but it's still a delicate balance.

I consider climate change a sort of science communication emergency. This is one area where people are thinking much more deeply than they used to about the need to work with religious groups and their leaders, rather than at cross purposes.

In an article you wrote (Priest, 2009, p. 233), you mentioned that research on the formation of public opinion on biotechnology, has shown that there are at least five different audience groups: those that are ready to accept science at face value and assume that it is benefical (or at least benign); those that want experts to take a technology assessment approach, researching the risks and benefits of individual technologies before making up their minds; those who want ethics to be the primary consideration in evaluating whether to adopt particular technologies; those who want the opportunity to weigh the risks and benefits for themselves; and those who want to make up their own minds, but on moral or ethical grounds. Could you detail more your ideas on this, for sharing with the readers of this special issue?

Every time I have studied a particular controversy, I seem to come up with a different configuration of groups, whether the work uses quantitative methods like surveys or more qualitative or analytical ones. Recently Tony Lieserowicz at Yale's Environment School and others have come up with a set of groups for climate change they call the Six Americas. This has been a valuable tool, one that does indeed remind me of my earlier work on the audiences for biotech. Even so, rather than "reify" a particular list, I think the take-home message is that as we try to communicate science, we should keep in mind the variations – sometimes even divisions – that define our audiences.

On the one hand, to be effective communicators, we need to think about how different groups of people will respond to what we have to say; on the other, we have to remember that we are always communicating to audiences that include a mix of different groups. We need to target what we have to say in ways that will reach particular groups, but we don't want to alienate others unnecessarily. Of course, this is especially true of areas where the goal is, in part, to achieve some kind of consensus on policy despite differences among individuals.

In non controversial scientific issues, do you think it is also possible to think about groups of audiences?

Yes, I suppose there are always groups, even where the science involved is not especially controversial. Some audiences are, of course, scientists themselves or others with higher levels of specialized training. They aren't necessarily smarter than everyone else, but they've been taught a particular way of looking at things that is unique to scientific inquiry, and often unique to their particular discipline. Some people are those I've sometimes called the "fans" of science; for whatever reason, they didn't become scientists, but they love science and try to keep up with what's being discovered. Yet others have less education and less interest, but they certainly want to know about the science that touches their personal lives and the lives of those they love. The typical TV viewer or newspaper reader, for example, doesn't want to know the details, most of the time.

Audiences also vary in terms of what I've begun to call "critical science literacy" – the knowledge that (for example) science is a social endeavor, that it exists within a political context (and often becomes politicized), that both expertise and methodology vary greatly within science, and that scientific consensus is strong on some points but weaker on many others, especially for science that is still emerging, and that science cannot solve everything. Scientists themselves may lack this kind of literacy.

Some scientists support the idea that some emerging technologies such as biotechnology and nanotechnology are too complex for non-expert people to understand – and, thus, non-experts should not participate in decisions related to policies on these issues or other decision making that has impact in society. Do you agree with these scientists's point of view? Could you share your thoughts on how non-experts could deal with risks and new developments?

This is certainly an interesting question, but not one that's easy to answer. I'd like to rephrase it to look at the same issue in a slightly different way. As we have learned with agricultural biotechnology, nuclear power, and many other controversial areas, the level of science literacy in the original sense – knowledge of agreed-upon basic scientific facts, even knowledge of the specific facts relevant to the controversy in question – are not strong predictors of people's

positions on the controversy. It thus follows that science education is not going to erase differences of opinion on whether the risks of some technologies might outweigh the benefits. And the benefits of science and especially of technology do not always outweigh the risks. If we had known in the first half of the twentieth century how many tens of thousands of lives would be lost each year in automobile accidents, let along what damage automobile emissions would cause to the atmosphere (and ultimately to the climate), would we have taken another path? I think most likely we would have, one that stressed mass transportation's efficiency rather than the individually owned automobiles' promise of freedom. Yet the preference for the latter was not just a question of cost-benefit analysis or even risk to life; it also captured American values, a strong preference for individual freedom that (as it turned out) had a bigger price tag than we'd initially realized.

Many choices we make about science and technology are – similarly – value-based choices, not choices that are fully determined by scientific facts. Why do some people prefer organic foods, for example? Sometimes it is on environmentalist or scientific grounds, but sometimes it is simply because they are attracted to a certain philosophy of agricultural practice – a matter of values, not of facts. And sometimes it is – quite literally, in this case – simply a matter of taste! Values are almost always involved in our decision-making to a greater or lesser degree; this is why knowing all the facts does not always eliminate differences of preference or choice. Yet the scientific and policy communities often assume that differences of opinion are a function of differences of education or knowledge. The data we've collected over decades shows that this is not the case – but the illusion that it is persists, and this is essentially what science communication scholars have come to call the "deficit model"[2]view of science communication. The hope is that by having broad discussion, we can both diminish the impact of especially unconsidered, even hysterical, reactions to new propositions, producing a more stable democratic consensus, and also include the broadest possible range of views, representative of the complex, pluralistic natures of most modern societies. One can at least hope that this inclusiveness will ultimately produce wiser decisions, as well as decisions that the largest share of people can "buy

[2] Term coined by social scientists studying the public communication of science in the 1980s, to characterise a widely held belief that underlies much of what is carried out in the name of such activity. According to David Dickson (2005), this belief has two aspects. "The first is the idea that public scepticism towards modern science and technology is caused primarily by a lack of adequate knowledge about science. Related to this is the idea that, by providing sufficient information about modern science and technology to overcome this lack of knowledge — or 'knowledge deficit' — the public will change its mind and decide that both science and the technology that emerges from it are 'good things'".

into." This certainly won't eliminate controversy and may sometimes exacerbate it, but then this is why democracy is often called "messy."

You finish one of you papers saying (Priest, 2009, p. 233-234): Within the scientific community, the expectation that public engagement is a good thing seems more generally accepted, but the future is uncertain. As modern science and technology that is expected to have broad social impact unfolds, there is an unmistakably heightened expectation that engaging the public is crucial to avoiding public opinion fiascos of the type that are believed to have characterized the introduction of biotechnology (although the assumption that better 'public engagement' will guard against public displeasure is not necessarily warranted). Newer generations of scientists may accept public engagement as a moral imperative, as well as a strategic necessity. Audiences who have instant Access via education, traditional media forms and the Internet to an incredible range of expert and non-expert opinions and perspectives are likely to demand further involvement in future decisions. But the reality of public engagement as currently conceptualized is highly uncertain. Most people will nott, cannot or simply do not devote time and effort to public engagement activities; simply put, if they were that interested in science, they probably would have become scientists. In the long term, process may be more important; that is, it may be more important that people feel that they have the opportunity to become involved –that they are not excluded– than that large numbers actually choose to become involved, a prospect that may not be realistic.

I found it very pessimist. Are you pessimist toward the possibility of a real public engagement in science?

I'm not so much pessimistic about this as realistic. Just now you asked me about citizen science. I think it's a really wonderful option but how many of us have time to really become engaged in that way? Many people would just as soon leave science to the scientists. This doesn't necessarily mean that they are anti-science; on the other hand, this is a form of engagement that could contribute to people's appreciation of science, their ability to understand its principle, and also their "critical science literacy" – that is, as discussed above, their understanding of how science really works.

Other new forms of public engagement we've been experimenting with around the world include the consensus conference model, which is actually several different models but in some way or another invites non-scientists to come together to discuss a scientific controversy or science policy issue in a systematic and thoughtful way. But most variations on this idea take place over a full day or even several days. Many of us have family and job responsibilities that would prevent this level of engagement.

On the other hand, I hope that citizens possessed of some level of critical science literacy can afford to be somewhat passive observers, appreciating what others have to say in forums like consensus conference, absorbing what journalists have to say in various old and new forums, and listening to what scientists (as well as their critics) have to say about new scientific developments, but yet despite this partial passivity, be actively turning these things over in their minds and asking the important questions – if only internally, to themselves, or to a few friends, if only on rare occasions. Modern life is a challenge. We are not all going to be able to become volunteer citizen scientists or attend consensus conference, science cafés, or science museum activities every week of the year. But we can all try, as citizens, to remain abreast of the issues of the day, including scientific ones.

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