

In addition to withholding information, proliferating disinformation, and inhibiting curiosity, there's at least one more way we can impose ignorance on others, and that's by undoing knowledge and sowing doubt. We can convince people that what they thought they knew they don't really know. We can create uncertainty or doubt where there wasn't any, or we can amplify existing doubts. The "manufacture of doubt" turns out to be a widely practiced stratagem, especially in politically-charged topics.

In order for seeding doubts to have the desired effect, it has to be acceptable to raise them in the first place. In some religious or political settings, for example, raising doubts about fundamental beliefs or values is regarded as heresy and therefore impermissible. In other settings, raising doubts is the norm. At first glance, social norms advocating this may seem scarce, but it's a matter of knowing where to look. Criminal trials in Western courts of law are one example. Another may be found in communities of scientists and scholars, where ideals of informed skepticism and critique can dominate so that any offering of new knowledge must pass trials-by-fire of skeptical scrutiny by experts before it is published.

Among my favorite skeptics to hang out with are [Alan Hájek](#) and his network of philosophers of probability. Any time I think I have a complete understanding of some fundamental aspect of probability theory, all I need do is present my views to them and usually within minutes those views will be demolished. Co-authoring a paper with Alan introduced me to the philosophers' rather stern version of peer review. Our paper went through several major reconstructions in the wake of successive hammerings at seminars and conferences before we deemed it suitable to even submit for publication (successfully, as it turns out).

These scholarly ideals and norms can, of course, be utilized for political ends. In his [1995](#) book "Cancer Wars," Robert Proctor documented the influences of professional, economic, and political interest groups and putting the bulk on American governmental priorities and funding of cancer research. One of his primary findings was that the government collaborated with private enterprise in the construction of ignorance regarding environmental and industrial causes of cancer.

The tactics and techniques for manufacturing doubt in the face of a scientific consensus were perfected by major tobacco companies during the 1950's and 60's, in their efforts to discredit cancer researchers' burgeoning evidence of the link between smoking and lung cancer. An infamous 1969 memo from one corporate executive declared that "Doubt is our product since it is the best means of competing with the 'body of fact' that exists in the mind of the general public. It is also the means of establishing a controversy."

David Michaels' [2005](#) article in "Scientific American" on the manufacture of uncertainty and later, his [2008](#) book, followed Proctor's lead. He identified three primary messages orchestrated by the tobacco industry to challenge the scientific consensus linking smoking with lung cancer: (1) Cause-effect relationships have not been established, (2) Statistical analyses are inconclusive, and (3) More research is needed. This industry hired its own scientists, founded its own research publication ("Tobacco and Health Research"), and carefully orchestrated a media campaign to spread their messages. Since then, Naomi Oreskes and Erik Conway's [2010](#) book on similar themes appeared, updated to include accounts of how doubts were manufactured concerning climate change and global warming in particular by organizations employing tactics inspired by the tobacco industry's example. I won't go into the details of doubt-inducing tactics here; the sources I've just mentioned do an excellent job on that topic. Instead, I want to dwell briefly on two issues that supplement those covered by those sources.

First, I should point out that uncertainty has its uses regardless of one's political stripe. Indeed, doubts can serve both sides of a scientific controversy simultaneously, albeit for different purposes. Some fifteen years before Proctor's book, I wrote an account (1980) of how both environmentalists and industrialists used initial uncertainties about the effects of CFCs on the ozone layer to bolster their agendas. Each side had seized on one of the two favorite responses to profound uncertainty. The environmentalists' position was a precursor to the precautionary principle: Ban CFCs until it can be proven that they are not harmful. The industrialists' argument reflected a well-known status-quo bias: Allow CFC production and marketing until they are proven harmful. Each camp clearly had its own preferences regarding which uncertainties aided their cause.

Second, Machiavellian scheming and normative skepticism are not the only producers of doubt. Doubt also can be an unintended byproduct of debate or balanced coverage of an issue. Journalists have been taken to task recently for giving "equal" time to global warming disbelievers, on grounds that the scientific consensus is so strong that lending credibility to disbelievers does the public a disservice. Holly Stocking and Lisa Holstein's 2009 paper presented a case study of the media coverage of a controversy following the rapid growth of industrial hog production in North Carolina during the 1908's and 1990's. Their chief interest was journalists' responses to various attempts by the North Carolina Pork Council to discredit and discourage a University of North Carolina public health scientist's research regarding health and environmental problems arising from hog production.

Stocking and Holstein began with the claim that "...claims-makers who offer contrary views, however outrageous, often are quoted in news stories because their inclusion reinforces the impression of journalistic objectivity, a hallowed ideal and a defining norm of journalists' professional values." (pg. 28). A byproduct of this even-handed exposure of views is increased (and perhaps unwarranted) public doubts about views that nonetheless are backed by considerable evidence and expert authority. One of their central claims was that often the combatants are aware of this norm and try to exploit it. A related point is that the scientists' norm of openly admitting limitations and uncertainties pertaining to their research findings can be a disadvantage when less scrupulous opponents magnify those caveats in order to discredit the research or the scientists themselves.

Stocking and Holstein related four kinds of journalistic attitudinal clusters to the ways in which journalists treat conflicting views in scientific controversies.

*Disseminator*: Ascertaining facts and getting them to the public quickly. All viewpoints are to be presented impartially, regardless of any differences in credibility or status. It is up to the public to sift through the competing views and decide which are plausible and which not.

*Interpretive/Investigative*: Investigating deeper interpretations behind the facts and providing useful context. This stance requires that the journalist make some independent judgments about what is credible or reasonable and what is not.

*Populist Mobilizer*: Giving a voice to the public and influencing political agendas. Again, this orientation entails some independent judgments on the part of the journalist, especially concerning what s/he thinks the public needs to know.

*Adversarial*: Maintaining vigilance and skepticism of public officials and special interest groups. This role involves uncovering hidden interests served by public pronouncements or silences in scientific controversies.

The Disseminator and Adversarial roles are the most likely to raise doubts, but they do so in different ways. The Disseminator's pursuit of even-handedness can lend weight to views

that in other forums would be completely discredited. Stocking and Holstein's examples of this approach included a reporter who "believed it was his obligation to publish the views of all parties to the hog research controversy, including the pork industry's 'pseudo-science' label [of the UNC researcher's studies] and its charges that the University of North Carolina had an 'anti-farm bias.'" (pg. 32) The Adversarial journalist, on the other hand, is more likely to raise moral doubts (e.g., are the scientists truly impartial about the evidence? Do they have vested interests of their own?). Stocking and Holstein's example here was an article that "framed UNC's School of Public Health as a tax-supported institution that was taking an 'activist stance' with varied 'anti-hog' activities in research and educational programs alike." (pg. 35)

Elaine McKewon's [2009](#) article also used a case study of media coverage, namely the Australian media treatment of Ian Plimer's [2009](#) book, "Heaven and Earth: Global Warming—The Missing Science." Unlike Stocking and Holstein, McKewon accused certain outlets (e.g., "The Australian" and "Sydney Morning Herald" newspapers) of ideological bias against mainstream climate science. Plimer's book was published in April, just prior to the debate on the Emissions Trading Scheme (ETS) legislation in the Australian House of Representatives (June) and the Senate (August) in 2009. Despite the book being discredited by several of Australia's top climate scientists, several newspapers published favorable editorials and opinion pieces about it, portraying it as a telling counter-argument against the scientific consensus on climate change. McKewon claimed that Australian media promotion of Plimer's book helped prevent the passage of the ETS legislation and swung the Australian public towards "denialism" about climate change.

Colin Schutz's [blog](#) last August, "Tips for young science journalists: A crash course on the major issues in the field," echoes the Stocking-Holstein claim regarding a widespread norm among journalists to give every side to an issue airing. He presents this as an example of a "frame" for a story. But his rationale isn't objectivity or even impartiality. It's attracting the readers: "The most common frame by far in journalism is conflict. Here is a 'good' guy. Here is a 'bad' guy. The journalist might play up whatever opposition there is between them. Setting up some conflict gets the reader to associate with the people involved, bringing them into a debate to which they may otherwise pay no attention." In short, controversy and, by implication, doubt, sells stories.

In some respects, the most interesting finding in both the Stocking and Holstein and McKewon articles was that journalists with a high degree of scientific literacy were less likely to follow the equal-coverage rule-of-thumb and more inclined to evaluate the various claims and counter-claims, in most cases coming out in support of the scientists. An implication is that the equal-coverage rule also may function as a let-out for journalists who are largely unknowledgeable about the science concerned. Those journalists' uncertainties are then transmitted, wittingly or not, to their audiences.