

Perception of Biotechnology Risks: The Emotional Dimension

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In an article in *Priorities* (Fall 1992), psychiatrist Glenn Swogger, Jr. discusses the importance of the "emotional dimension" of public concerns about risk and threats to the environment. His paradigm is strikingly applicable to the controversies that have engulfed the "new" biotechnology and it can be used to understand apprehensions about these technological advances.

Swogger observes that in developing public policy, fear and intimidation may distort the accurate assessment of risks (or even perceived risks), benefits, and possible alternatives. This can lead to decisions that are harmful from both an economic and humanitarian perspective. Understanding the emotional dimension can help policy makers to address largely emotional responses by their constituencies; "opinion leaders" in their common role as risk communicators; and the public in making more clear-headed decisions and remaining free from cynical manipulation.

Emotional responses to potential technological risks

Swogger lists several factors that can cloud thinking about risks and that have been prominent in various controversies about biotechnology:

Uncertainty and ambiguity. Studies of risk perception have shown that the public tends to underestimate familiar risks and to overestimate risks that are unfamiliar, hard to understand, invisible, involuntary, and/or potentially catastrophic. For example, to a greater degree than risks that are relatively clear and comprehensible in their nature, such as using a chain saw or riding a motorcycle, invisible "threats" such as electromagnetic radiation or trace amounts of pesticides in foods inspire uncertainty and fear. Contributing to these emotions may be scientific illiteracy in general and unfamiliarity with the probabilistic aspects of risk in particular.

In the case of the new biotechnology, there are other contributory factors. First, there is the widespread ignorance of the long, safe history of "conventional biotechnology" to produce vaccines, enzymes, and antibiotics, as well as virtually all of our domesticated crops. Second, where "genetic manipulation" moves genes between organisms, there seems to be a fear of disturbing evolutionary sanctity or the "natural order" of things. Moreover, many people do not understand the concept of alternative risks; for example, while there are theoretical risks of using biocontrol agents to kill plant pests, there are also risks of *not* using them—namely, the need to rely on chemical pesticides or the

loss of large amounts of crops.

Information overload. At best, nonexperts are likely to understand only a limited number of aspects of a risk analysis problem, and they are easily overloaded with data. Information overload of the public is a strategy often used by those who would disparage or elicit fear about new technology. In one short peroration on biotech-derived foods, a biotech antagonist might address: the consumer's "right to know" via product labeling, the "vegetarian issue" of fish genes spliced into tomatoes, the socioeconomic issues of bovine growth hormone, and the alleged dangers of herbicide-resistant plants.

Antibiotechnology activists deluge the public with irrelevant, untrue, or (still more pernicious) partly true information that leaves the nonexpert bewildered, leading to snap decisions and poor judgment. Overabundant information, especially when it involves emotionally laden and lurid scenarios, has another drawback. It may encourage some of the public who are interested in the subject but inexperienced, to focus on unusual and dramatic aspects of the problem instead of on representative data and statistics.

Splitting and projection. A common response to fear and uncertainty is to split those involved in controversy into opposite camps—*us* vs. *them*—and to project onto *them* culpability and iniquitous intentions. Psychologically, this is an attempt to reduce anxiety and to reimpose certainty and clarity. These mechanisms may be especially easy when the "enemy" is painted as faceless, profit-hungry, multinational companies that will benefit from selling the products of new biotechnology. But these mechanisms are unproductive, because they polarize our thinking and actually distort sound decision-making.

Guilt and self-doubt. Swogger notes that in an affluent society, "most of us have some degree of guilt about our good fortune compared to others" and discomfort about the envy that we elicit. We tend, therefore, to "internalize [our] critics' attacks and become apologetic and self-depreciating." I would argue that this has been a factor among the practitioners of the new biotechnology that has prevented academic and particularly industrial researchers from defending themselves vigorously against unwarranted attacks and from crusading for more reasonable treatment by government regulators.

The wish for a return to a childlike world of purity and innocence. According to Swogger, this romantic view of the physical world, reflecting a wish to "flee from complex realities and difficult choices," when combined with guilt [*vide supra*], can give rise to a kind of puritanical, antitechnological view of the

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world. Purity becomes a desired end in itself, to the exclusion of other goals, such as feeding and sheltering the inhabitants of the planet.

Manipulation of environmental anxieties. Swogger attacks this point as though he had the new biotech in mind: "To the extent that environmental organizations, political leaders, and the media profit by raising levels of fear, suspicion, and anxiety, they contribute to our difficulty in using sound judgment and scientific knowledge to resolve environmental problems." Clouding the public's understanding of the development of new varieties of crop plants, certain environmental organizations and the media have raised disinformation to an art form. The *New York Times* even coined the term, "Frankenfood." Instead of trying to educate the public to a rudimentary perspective on new and "conventional" biotechnology—namely, that the new is a refinement or extension of the traditional—many regulators have regarded public apprehension as a meal ticket. The U.S. Department of Agriculture (Washington, D.C.), the Environmental Protection Agency (Washington, D.C.), and the European Community (Brussels, Belgium) have built huge, expensive, and gratuitous biotechnology regulatory empires preoccupied with negligible-risk activities, and have succeeded in protecting consumers only from enjoying the benefits of the new technology.

Advice to nonexperts

Swogger has several suggestions for nonexpert members of the public:

Be skeptical of language that is inflammatory but vague. For example, the antagonists of food biotech cry, "Do you want fish genes in your vegetables?" One should ask, critically, what changes in the food—if any—do these genes cause? Are the genes and their products already in the food supply and commonly consumed? Educate yourself to find out what scientists really know about a problem, so that you are able to distinguish genuine health or environmental concerns from scare tactics. Become active when safety issues are discussed and debated; don't leave the platform to those who espouse extreme views.

Draw upon your goals and values. For example, this includes your commitment (to whatever degree) to freedom from unnecessary governmental intervention; the right of consumers to choose among new products in the marketplace; and the right of the public to be governed in a rational and sensible way, free from condescension and misinformation.

Advice to "experts"

To the points intended for the public, I would add some others for the practitioners and regulators of the new biotechnology:

Keep in mind the emotional dimension of reactions to research, product testing, and marketing, especially when a new technology is involved.

Those who do not have a financial interest in biotechnology have an important educational role. Keeping the public and the media informed is essential especially by academics and regulators who can explain the state of our scientific knowledge and what are the real issues. Use simple, graphic, and concrete material, avoiding technical jargon wherever possible. This can reduce the uncertainty and ambiguity as the public learns that the mysterious Frankenfood is really no more threatening or problematical than a genetic hybrid such as a tangelo or than the *Lactobacilli* bacteria that make and are found in yogurt.

Knowledge is power, and this information empowers people, making possible informed choices. An accurate perspective also exposes the wish for a return to a pristine and pure childhood world for what it is—romantic naïveté.

Inform the public about the nature of safety assessments of field trials of products such as new crop varieties, vaccines, etc., during their development and advertising. Be measured, conciliatory, and collaborative. When people ask, "Can my child be injured by this new vaccine?" respond in a personal way that acknowledges risks, benefits, and uncertainties. A personal approach can mitigate the splitting and projection discussed above, as the public discovers that the users and regulators of new technology and new products themselves have a vested interest in the safety of product testing and use.

Work diligently to expose the flawed logic and dishonest tactics of the antitechnology ideologues. They are seldom either educable or misinformed; rather, they are waging a calculated campaign against the new technology, for reasons that are naive, self-serving, or both. No strategy is out of bounds to them—they threaten, misrepresent, and litigate.

Antiscientific and antitechnological activities can be mitigated in several specific and critical ways. Complain to the institutions that fund these activities (and to members of their boards). Expose their false premises and statements by speaking at meetings and conferences and by writing articles. Inform journalists as to which views lie outside the legitimate, respectable spectrum of opinion, thereby elevating the level of discourse. Serve on governmental advisory committees and submit letters on regulatory proposals during the public comment period, always insisting that government regulators heed scientific principles instead of the vocal special interests. Finally, mobilize institutions—professional associations, faculties, academies, and journals—to participate in the dialogue.

In the formulation of public policy, as in elections, if we are apathetic we get what we deserve. Citizens and specialists should participate actively, always insisting on the tight coupling of science and public policies. Along the way, they should keep in mind that cold analytical logic does not automatically win the day, and that there is an inevitable emotional dimension to dialogue on safety and risk. ///