

Frames and biotechnology

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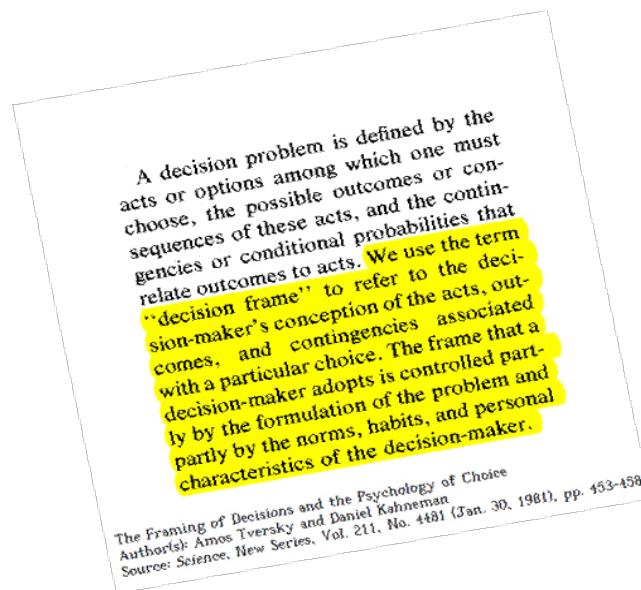
The world wide web and new media have substantively altered the ways in which various audiences encounter biotechnology. For example, IVF clinics worldwide maintain websites that serve to market their services to potential customers. Transhumanism enthusiasts can subscribe to the RSS feeds from Ray Kurzweil's boosterist AI.net. Curious students can learn about epigenetics by watching online slide shows narrated and produced by researchers at major institutions. Women's rights activists can follow the tweet streams of individuals and organizations and generate content of their own to galvanize a range of publics globally.



That said, for most of biotechnology's history, editors and reporters in the mainstream media have determined the frequency and nature of biotechnology coverage, influenced by the public relations machinery of major universities, research laboratories, and corporations, as well as by individual researchers and clinicians and their professional organizations (e.g., ASRM). While there have been important studies of the complexion of this coverage--I'm thinking here in particular of the work of people like Dorothy Nelkin, Ruth Hubbard, Richard Lewontin, Sheldon Krimsky--there have been few

comprehensive content analyses of newspapers and magazine coverage in terms of framing.

I'll be talking briefly and very tentatively today about a content analysis project that I'm working on, looking at representations of biotechnology and genetic engineering in print mainstream media over the last decade. The results are preliminary, but some interesting patterns are emerging about the types of frames that are being used. As most of you know, frames are an aspect of decision making theory that have gained a lot of attention recently, most notably in the best-selling *Nudge* by behavioral economist Richard Thaler and Cass Sunstein, the Harvard law professor now working in the Obama administration.



"The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision maker." --Amos Tversky and Daniel Kahneman

The notion of "decision frames" was first advanced by Amos Tversky and Daniel Kahneman in the early 1980s. As they studied the ways in which people made decisions, they showed that rational actor conceptions of human choice simply didn't fit. In fact, any number of factors influence decisions, some falling rather far outside the rationalist

camp. Frames are one of these factors, such that, depending on how a choice is framed, you will get very different results. An example would be patients choosing an operation at different rates, depending on whether the physician described the same outcome in terms of the percentage of people who survive versus the percentage of people who die.



Urs Dahinden sees frames operating in four key ways in mass communication:

- **“patterns of reporting and media coverage”**
- **“professional norms of journalists and public relations officers**
- **“mental modes and schemas” of audience**
- **“traditional narratives and myths” carried into modern society**

There hasn't been a lot of work done on frames and biotechnology, but Urs Dahinden, a mass communications researcher in Switzerland, carried out a study in 2004 looking at press coverage of a heated public debate over biotechnology in that country. Dahinden enumerates four ways in which frames are used in the mainstream media, both in terms of those generating the content and those receiving it. Dahinden performed a kind of meta-analysis of several authors who had used frames to examine contemporary debates over technology and politics. He generated a number of generic frames and a typology into which he could fit the other researchers. His typology looked like this:

TABLE 2
Comparison of Frame Typologies

<i>General Frame Description</i>	<i>Peters (1994)</i>	<i>Gamson and Modigliani (1989)</i>	<i>Durant, Bauer, and Gaskell (1998)</i>	<i>Just, Crigler, and Neumann (1996)</i>	<i>Semetko and Valkenburg (2000)</i>
Science is informing the public on issues without any impact on practical decisions	Informing the public	Progress	Progress	—	—
Science as consultant for individual or societal decisions that are not very contested	Consultancy	Progress	Progress	—	—
Science as consultant for contested issues; science is used as argument by one or several conflicting parties, thresholds for known risks	Controversy	—	—	Us-them	Conflict
Government and other public bodies have the ability to address the problem	—	Public accountability	Public accountability	—	Attribution of responsibility
Moral messages, ethical principles, social prescriptions	—	—	Ethics	—	Morality
Accidents have taken place, science is involved as a responsible actor	Scandal	—	—	—	—
Economic prospects of science and technology	—	Economic prospects	Economic prospects	Economic impacts	Economic
Call for restraint in the face of unknown risks, “opening of flood gates” warnings, catastrophe warnings	—	Devil’s pact	Pandora’s box	—	—
Powerlessness, fatalism after having adopted the new technology	—	Runaway train	Runaway train	Control	—
Environmental vs. genetic determination, heredity issues	—	—	Nature/nurture	—	—
The new technology has negative impacts on the environment; there are other options such as renewable energy and energy conservation that are realistic alternatives	—	Soft energy paths	—	—	—
Call for global perspective, national competitiveness within a global economy, or the opposite: splendid isolation	—	Energy independence	Globalization	Globalization	—
Impacts of public decisions on individuals or specific groups, human examples	—	—	—	Human impact	Human interest

Biotechnology in Switzerland: Frames in a Heated Debate

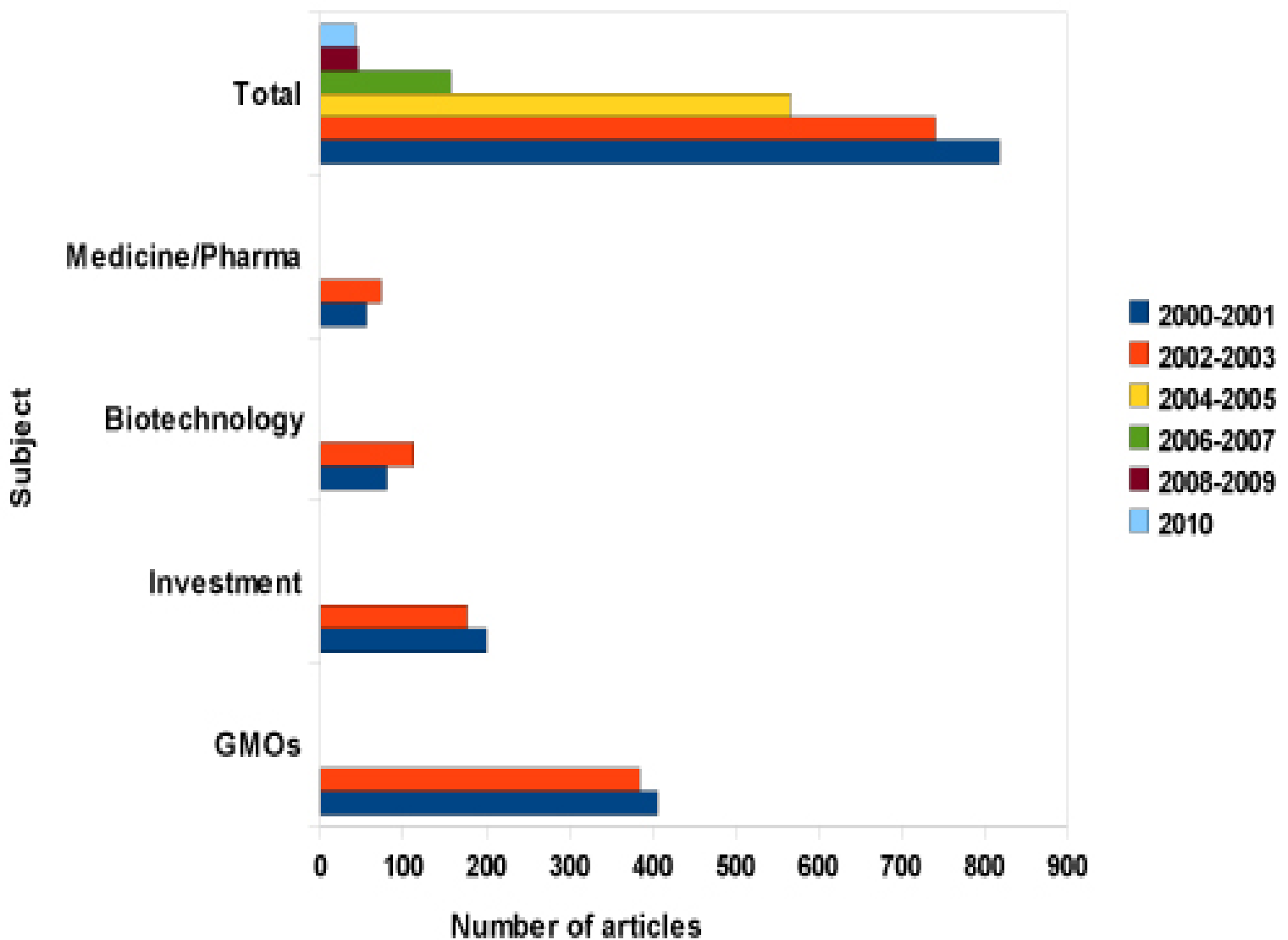
Urs Dahinden

Science Communication 2002; 24; 184

As part of my larger project, I plan to employ Dahinden's typology. But for now, I've opted to generate frames inductively, based on the material I've been working with. I used Lexis/Nexis Academic, searching the Major World Publications database, which catalogues “full-text news sources from around the world which are held in high esteem for their content reliability.” I narrowed results down to English language Newspapers and Magazines, eliminating trade publications, newsletters, and newswires. I first did a

search for "biotechnology" and "risks" in two-year segments. I've completed reading articles from 2000-2003. This was a period in which the OECD protocols for GMOs were being drafted, the Human Genome Project was completed (in June 2000), and an international debate was raging over field testing and labeling of GM products. It was also after the dot.com boom busted.

"Biotechnology" and "risks" Major World Publications (English)



I categorized stories according to the major subjects, those that discussed genetically modified plants or animals; those focusing primarily on investment opportunities; those discussing biotechnology in general (including genetic manipulations of humans); and those discussing specific pharmaceutical products or therapies. Despite being aware of the ways in which biotechnology was hyped for investment purposes, I was surprised at the large proportion of stories devoted to financial risk.

Perhaps the most readily apparent pattern is that the total number of stories in which "risks" were discussed in connection with "biotechnology" fell markedly across the decade. Close reading of articles from 2000-2001 and 2002-2003 revealed that discussion or risk went up somewhat with regard to pharmaceutical applications and biotechnology in general. In stories from 2000-2003, stories typically acknowledge that risks continue to be disputed within the scientific community. The question, then, is what accounts for the significant falloff, after 2005, in the number of stories mentioning risk. Does this reflect claims issuing from the scientific community that risks have been assessed and are minimal or nonexistent? Or are we witnessing the phenomenon we've seen so many times in this history of technology, whereby technologies become "domesticated" and societies perceive them as less risky. (The documentary "The Atomic Cafe" has some illustrations of this process from the U.S. in the 1950s, in which cocktails are named after the atom bomb, and cartoons and song lyrics use "atomic" as a expression of magnitude stripped of moral or ethical reference.) An explanation of the reduction should be more apparent once I've completed close reading of the remaining stories.

I've also carried out a Lexis-Nexis Major World Publications search of English language Newspapers and Magazines for the terms "genetic engineering" and "risk", and am in the process of carrying out a more detailed frame analysis of the results. The following graph shows the results from 2000-2001 and 2008 to the present, with the frames drawn directly from the articles themselves. (The *n* for 2000-2001 is 145 articles, and for 2008-present, 107.) Where a story had multiple frames, I tabulated each of those frames. This was a period in which the EU adopted the precautionary principle, New Zealand was debating whether to permit GM field testing, Prince Charles spoke out against GMOs, and Craig Ventner's lab produced so-called "synthetic life."

"Genetic engineering" and "risks"

World Newspapers and Magazines



Probably as a result of my search values, risk-benefit analysis as a frame predominates. But, interestingly, multiple additional frames are pulled up by a search for “risks” alone, some of them quite positive. Note, for instance the increase in the number of stories in recent years touting the medical benefits of genetic engineering and assuring people that fear is unnecessary, because of the great benefits the technology will provide.

Over all, I'm impressed by how extensively print press coverage with relation to biotechnology and genetic engineering has focused on plant GMOs (recall, for example, that only two biotech crops are currently allowed in Europe, Mon 810 corn from Monsanto and BASF Amflora potatoes), and how little on medicine or human reproductive technologies. This could be an artefact of the search terms—doing a database search for IVF, gene therapy, and other terms would likely change this view significantly, and I'll be doing such searches.

The key purpose here is to understand more fully how the press has framed issues with regard to human biotechnologies so that we can reframe the issues more effectively to achieve our purposes—however we define them, whether in terms of human rights, women's rights, social justice, environmental sustainability, or what have you.

Finally, I wanted to get a sense of press usage of the term we're using here at Tarrytown to define the broad category we're concerned about. So, I did a google search of “human biotechnologies” and brought up only about 5000 hits (see image below). I also did a Lexis/Nexis search and yielded only 16 hits, only one of which was actually for the plural phrase in the sense we're using it here. And that was Marcy Darnovsky quoted in a 2006 Christian Science Monitor piece by Gregory Lamb. Tarrytown to define the broad category we're concerned about. So, I did a google search of “human biotechnologies” and brought up only about 5000 hits. I also did a Lexis/Nexis search and yielded only 16 hits, only one of which was actually for the plural phrase in the sense we're using it here. And that was Marcy Darnovsky quoted in a 2006 Christian Science Monitor piece by Gregory Lamb. This suggests to me that there needs to be a concerted effort to promulgate this terminology, if we're to be successful at reframing the issues; or that we need to consider alternate terminology.



"human biotechnologies"

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