

## **MASS MEDIA COMMUNICATIONS ABOUT AGROBIOTECHNOLOGY**

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The media is often accused of sensationalism and bias in its reporting of agrobiotechnology. In this paper, we examine United States (US) and United Kingdom (UK) media coverage of agrobiotechnology. Our findings confirm bias in so far as coverage has emphasized different frames (biosafety and food safety) at various points in time depending on unfolding events. We also find that the media may well have played an agenda-setting role for the public—ultimately raising awareness about agrobiotechnology on both sides of the Atlantic.

*Key words:* agrobiotechnology; media analysis; content analysis; risk perception.

Since their introduction, foods derived from bioengineered crops have experienced public resistance in certain parts of the world, and particularly in Europe. Many factors have been hypothesized to drive the negative reception of GM foods in Europe, among others:

- A refusal of consumers to accept any risk in the face of little perceived direct benefit;
- An alleged lack of trust in food regulatory agencies in Europe and elsewhere;
- The unfortunate coincidence of the commercialization of GM foods with the BSE (“mad cow”) crisis;
- A perception that scientists are unreliable in managing the consequences of new technologies;
- Protectionist interests on the part of European governments to prohibit trade in genetically modified (GM) crops;
- An unyielding attitude by the US towards labeling and the consumers’ “right to know;”
- Anti-American sentiment; and
- Sensationalistic and biased coverage by the mass media.

In this paper, we focus on the last hypothesis and analyze media coverage of agrobiotechnology. The media has been accused of sensationalistic and biased coverage by both sides of the debate (see, for example, Parker, 2002; *PR Week*, May 2, 1997, p.5). We update our previous results (Marks *et al.*, 2002) and draw on other work (Marks, Kalaitzandonakes, & Zakharova, *in press*), in order to focus on the “agenda-setting” role of the US and UK media in its coverage of agrobiotechnology.

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## Media's Role In Framing Biotech Food Stories

As part of the public sphere (Durant, Bauer, & Gaskell, 1998) the media provides a forum where public debate can actively take place. Ideally, the media plays the role of arbiter, facilitating communication among various societal stakeholders and providing counter viewpoints from different sides of a debate. Likewise, it can be viewed as a vehicle for informing the public on the scientific nuances and complexities of a new technology, such as biotechnology. However, reporters rarely work within a vacuum and in such an idealistic way. Indeed, sociologists and journalists have long investigated how reporters “frame” the stories that they write.

As frames, news stories offer the public definitions of social reality (Marks *et al.*, 2002, p. 220). Tuchman (1978) has pioneered the concept of a “story frame.” In reporting a story, journalists turn an occurrence into a newsworthy event, a newsworthy event into a story, which is then communicated to the public (Marks *et al.*, 2002, p. 220). Journalists and editors adjust frames according to their own understanding, their ideologies, styles, and practical limitations such as deadlines and space (Best, 1990, 1991). Writing on science and technology can thus emphasize scientific facts, their sociopolitical implications, environmental risks, human health concerns, and so on (Horning, 1990). Likewise, through frames, media highlight certain points of view and marginalize or ignore others, defining occurrences, and explaining how they are to be understood (Hornig, 1993).

It has frequently been argued that in framing risk, the news media may also define the agenda of public concern about a given technology or even directly influence public opinion itself, although little agreement exists about this latter influence (Marks *et al.*, 2002, p. 220). Rather, the role of the media is likely to be more subtle, indirect, and cumulative over time. Lang and Lang (1966, p.468) have observed that, “the mass media force attention to certain issues.... They are constantly presenting objects suggesting what individuals in the mass should think about, know about, have feelings about.” The agenda-setting function of the media has also been succinctly summed up by Cohen (1963, p.13) who noted the press “may not be successful...in telling people what to think, but it stunningly successful in telling people what to think about.”

## Methodology

We draw on the early work by Fischhoff *et al.* (1978); Slovic, Fischhoff, and Lichtenstein (1980); Slovic, Fischhoff, and Lichtenstein (1985); and Slovic (1987). These studies showed that perceived risk is both quantifiable and predictable, concluding that most risks can be grouped along two dimensions. First, the degree to which the risk is a “dread” risk: its consequences are catastrophic, uncontrollable, potentially fatal, not equitable in their distribution, pose high risk to future generations, are not easily reduced, and are involuntarily imposed. Second, the degree to which the risk is an unknown risk: it is not observable, not evident to those exposed, its effects are delayed, and its risks are not definitively known to science. These two broad risk categories provide the framework for a quantitative model of risk perception.

In this study we analyze the framing of two aspects of agrobiotechnology—biosafety and food safety—that have been actively debated. We use content analysis to investigate these frames. We examine five national newspapers—the Wall Street Journal, Washington Post, and USA Today in the US; and the London Times and Daily Telegraph in the UK. A comprehensive database of all articles related to agricultural and food applications of biotechnology, published in the selected media, was developed based on an exhaustive list of keywords. Our coverage is from 1990 to 2001.

Dictionaries of words or phrases were used to construct our variables. Coding of words and word phrases can be done electronically and word counting is objective. Key-word-in-context (KWIC) analysis was used where the contextual unit is words “before” and “after” the word or phrase included in each category. Development of these dictionaries involved an iterative process where once an initial list of words had been developed, computer generated key-words-in-context lists were used to determine which words and phrases contained in the draft dictionaries were accurate indicators of measured content. Where words and phrases were used ambiguously or incorrectly in context, either they were removed from the dictionaries or manually coded in context.

## **Results And Findings**

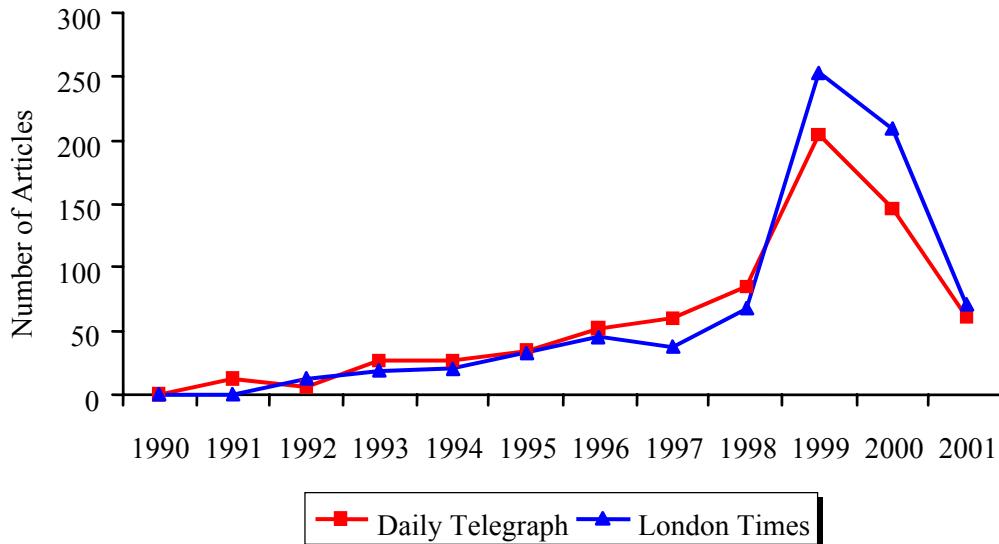
Since pre-commercialization the amount of agrobiotechnology coverage (which includes GM foods and crop/animal applications) has increased in both the US and the UK (figures 1 and 2). However, US coverage started earlier and has continued at a steadier pace than UK coverage. In the UK case, media coverage peaked in 1999 and has subsequently declined. This peak in coverage was two to three times that of the US.

Such intense coverage has influenced public awareness about biotechnology, as expressed in public opinion surveys (Gaskell *et al.* 2000; Hoban, 2000). In 1996, the Eurobarometer (EC, 1997) survey indicated that on average 47% of Europeans had not heard anything about biotechnology through television, newspapers, or radio. In the UK, the average was slightly lower, with 45% of the public unaware of biotechnology issues. A related question was asked in the 1999 survey (EC, 2000, p.9), Europeans were asked if they could “indicate what comes to mind when [they] think about modern biotechnology in the broad sense, i.e., including genetic engineering?” On average, 28% of Europeans responded with “Don’t know,” indicative of a level of awareness about biotechnology that was considerably higher than that of 1996. In the UK case, the “Don’t know” responses were higher (38%) than the European average but still lower than their original level in 1996.

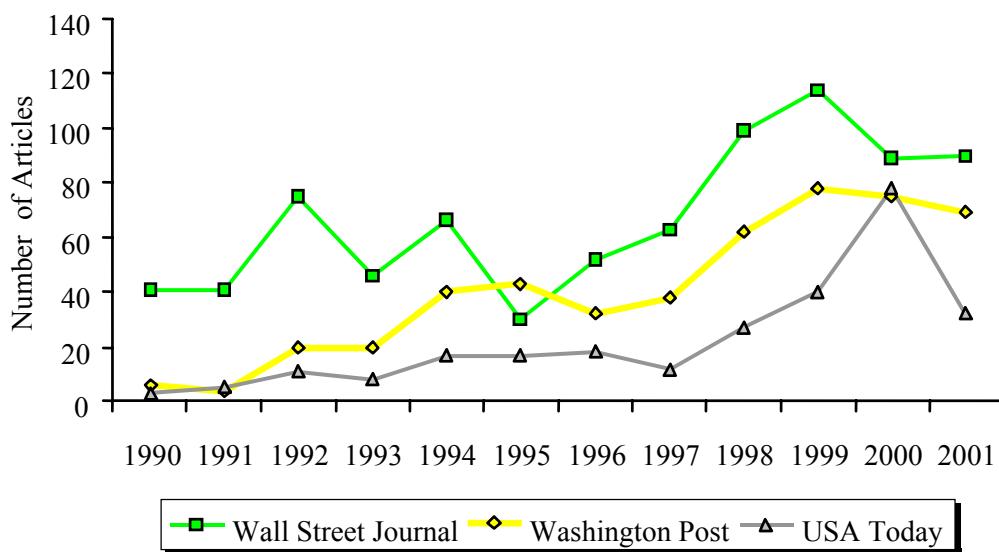
Hoban (1998, 2000) has tracked US public opinion of biotechnology since the early 1990s. United States public awareness of biotechnology has remained low, ranging anywhere from 29% of the public indicating that they had “heard ‘a lot’ or ‘something’ about biotechnology” in 1996 to 47% in 1997. Awareness declined to 40% in 1999 but has since increased to 49% in October 2000 (Hoban, 2000).

This level of awareness corresponds to increased media coverage of agrobiotechnology in the US. Although agrobiotechnology constitutes a subset of applications within biotechnology, arguably it drew more attention than other applications in the heated debates of 1999 and 2000 (figures 1 and 2). A substantial amount of coverage has been devoted to Starlink from September 2000 onwards when the story first broke. Surveys (IFIC, 2001) conducted post Starlink suggest that it raised public awareness about biotechnology but that level has subsequently declined. Hence, there is some evidence in support of a correlation between increased media coverage devoted to an issue and increased public awareness (Gaskell *et al.*, 2000; Hoban, 2000).

**Figure 1: UK Coverage of Agrobiotechnology from 1990–2001.**



**Figure 2: US Coverage of Agrobiotechnology from 1990 – 2001.**



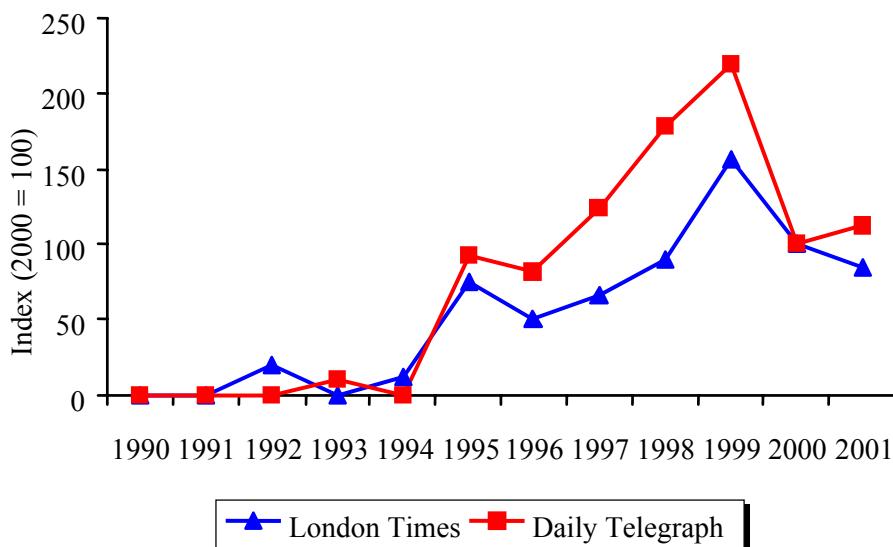
### Framing and Agenda Setting

Reporters can choose to highlight certain issues or viewpoints in news stories while ignoring others altogether. Two important kinds of risks have been highlighted in the public debate about agrobiotechnology—its implications for food safety and the environment. From 1995 onwards (one year preceding the BSE food crisis) the UK media set the agenda about biotechnology, linking it explicitly with previous and on-going food crises. Figure 3 indexes coverage of two of Slovic's dread risks—namely, catastrophic and memorable<sup>1</sup> food safety related events (e.g., BSE, dioxin, listeria, E-coli food contamination) in UK coverage of agrobiotechnology. Coverage linked the potential for GM foods as a repeat of the UK experience with BSE or “mad cow disease.” In contrast, linkages to biosafety crises have not been as intense (Marks *et al.*, 2002)

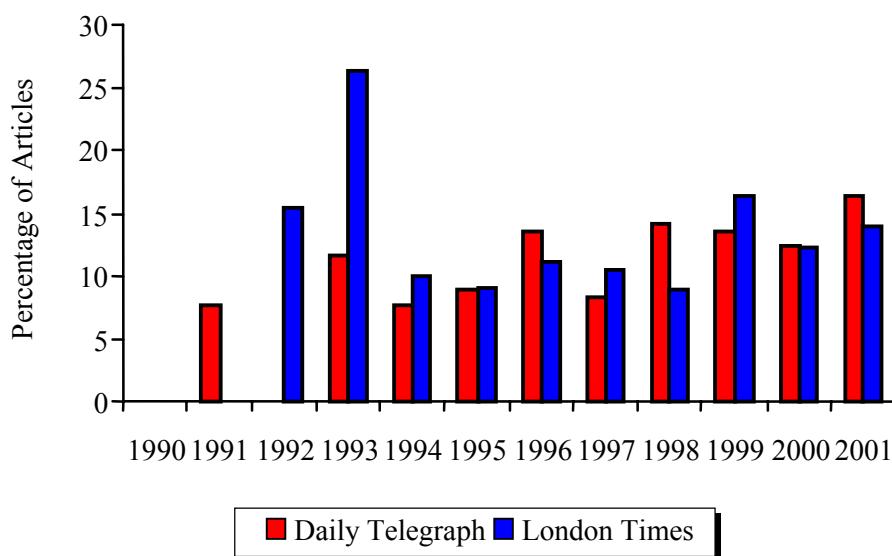
and figure 4. The potential environmental benefits of agrobiotechnology also have been less emphasized.

Such framing may partly account for Gaskell *et al.*'s (2000, p. 935) finding that European consumers have expressed greater opposition to GM foods than GM crops, "suggest[ing] that, for the public, food safety outweighs environmental concerns." In other words, despite an early emphasis on potential benefits of GM foods (higher in protein, lower in fat, longer shelf life, improved taste) (figure 5), by 1999 reporting was increasingly negative, indicating a switch to emphasizing food risks over benefits. Likewise, food safety was ultimately the focal risk.

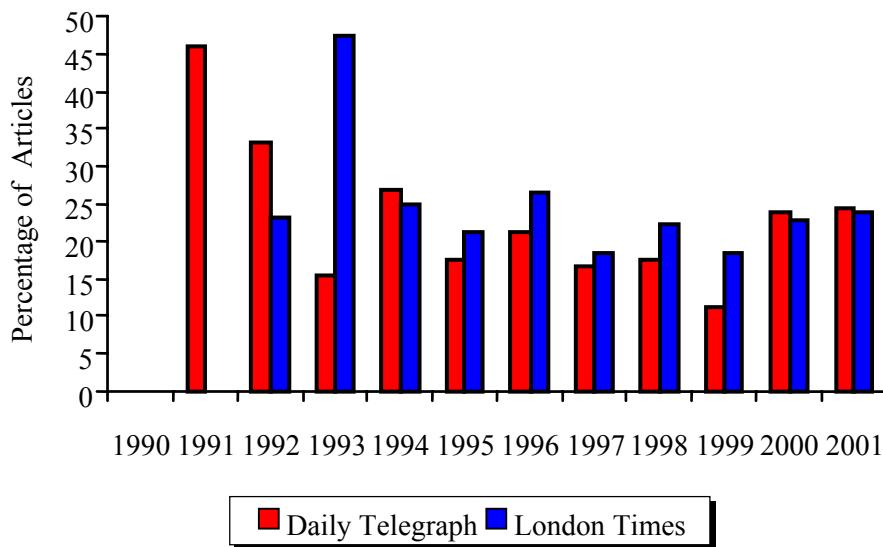
**Figure 3: Reporting of Risks in UK Coverage of GM Foods.**



**Figure 4: Reporting of Biosafety Risks in UK Coverage of GM Crops.**

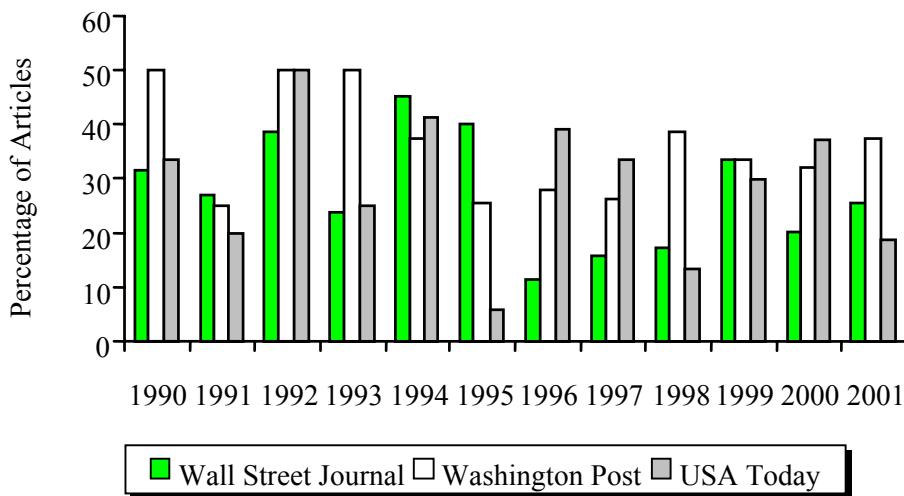


**Figure 5: Reporting of Benefits in UK Coverage of GM Foods.**

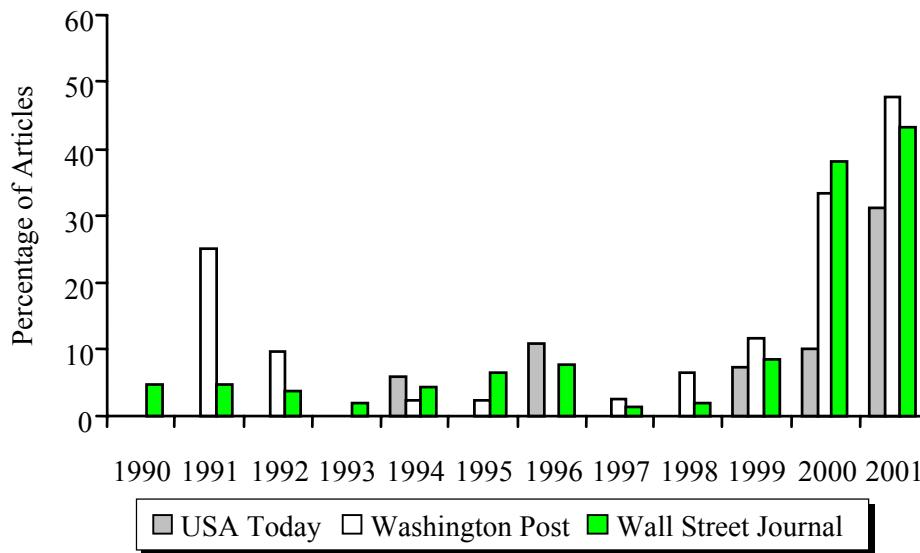


In contrast, US coverage of agrobiotechnology has been more positive in tone over the 1990s than UK coverage, emphasizing its potential benefits over its related risks (Marks, Kalaitzandonakes, & Zakharova, *in press*). The US media have devoted more coverage to the potential benefits of GM foods (figure 6). However, since the intermingling of Starlink corn with approved GM varieties, which resulted in the recall of some foods in the US, dread risks have been more prominent in US reporting of agrobiotechnology (figure 7). In particular, the media has reported on the potential for allergic responses on the part of consumers to traces of Starlink corn in food products.

**Figure 6: Reporting of Benefits in US Coverage of GM Foods.**



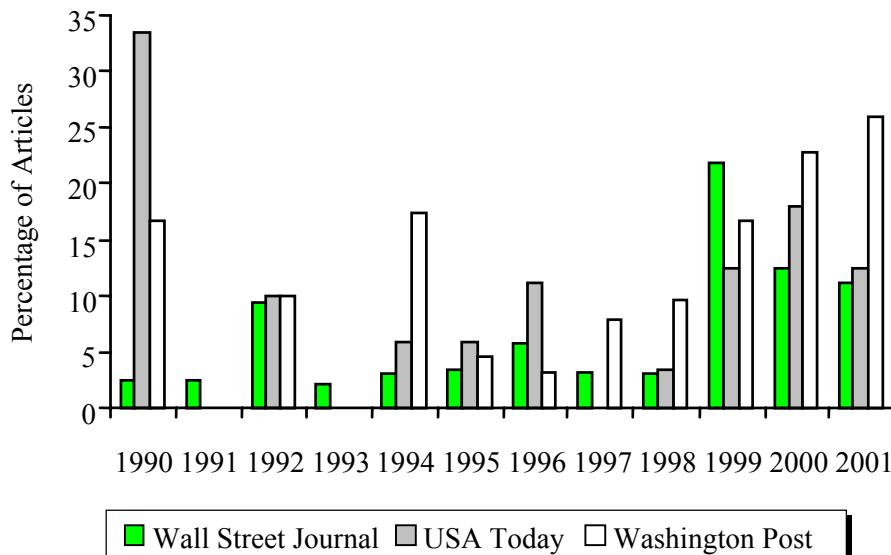
**Figure 7: Reporting of Risks in US Coverage of GM Foods.**



Biosafety benefits and risks from GM crops have been relatively underreported (as in the UK case). One exception has been reporting of the laboratory study results by Losey *et al.* (1999) indicating monarch butterflies could be potentially harmed by GM corn pollen. As has been found elsewhere (Koren & Klein, 1991) the earlier negative study received more media attention than subsequent reporting of field level findings which indicated minimal, if any, harm to monarch butterflies. Nevertheless, all three US papers did report on the subsequent follow up studies to varying degrees (figure 8).

Figures 3 through 8 also indicate media coverage of agrobiotechnology has been both cyclical in tone and event driven. Hence, biosafety events such as the monarch butterfly story, and food safety events such as BSE and Starlink, have been heavily reported on both sides of the Atlantic.

**Figure 8: Reporting of Biosafety Risks in US Coverage of GM Crops.**



## Conclusions

The media has often been accused of sensationalism and bias in reporting of events pertaining to agrobiotechnology. Our findings confirm such bias in so far as coverage has emphasized different frames (biosafety and food safety) at different points in time, depending on unfolding events and scientific and risk management controversies. In the early 1990s, coverage in the US and UK was predominantly favorable towards agrobiotechnology, emphasizing the promise of the new technology. However, events such as BSE and Starlink have affected the tone of coverage on both sides of the Atlantic. As Starlink has been broadly viewed as a failure of management and oversight on the part of risk managers (despite no apparent health effects from consuming the unapproved corn), such reporting seems appropriate. It is certainly within the remit of the media to expose such lack of oversight.

Recognition of such circumstances provides an important lesson for risk managers in charge of the regulation, oversight, and monitoring of agrobiotechnology. Events such as Starlink influence the tone and amount of media coverage. While the same intensity of coverage never materialized in the US, memorable regulatory lapses are still reported years after the initial controversy is over. Such events have been found to initially raise public awareness (IFIC, 2001) as well.

Slovic's (1987) model of risk perception provides a useful framework for analyzing media coverage of technological controversies such as agrobiotechnology. From a risk communication perspective, we find that the media may well have played an agenda-setting role—ultimately raising awareness about agrobiotechnology both in Europe and in the US. Preliminary evidence would suggest that such awareness may be transitory and not permanent, however. This finding is consistent with findings in other studies of technological controversies, such as nuclear power (Leahy & Mazur, 1980, p. 271).

## Endnotes

<sup>1</sup> The “catastrophic” and “memorable” events dread categories are used in order to make comparisons across the two frames and countries in subsequent figures.

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