

## **Altering Public Opinion: The Role of Authorship Framing**

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In this paper I probe the role of authorship in public opinion, what shapes it, and how it is altered. The debate over genetically modified foods provides a prime example of a policy area where the public is distrustful and where strong preconceived attitudes exist. Because genetically modified (GM) foods may offer benefits not only to the developed world, but even more importantly to the developing world, this issue serves as a prime opportunity to look at how public policy officials effectively alter the public's perception. Public opinion regarding GM foods, in the developed world, impedes social acceptance and policy initiatives aimed to incorporate GM into food markets—hence making impotent the great advances this technology is capable of providing to humanity. In this paper I look at how authorship can frame the information being disseminated to the public.

### *Shaping Public Opinion*

For many years, political analysts have understood that the American public lacks a clear understanding and comprehension of most public policy domains. (A distinction should be made here that the earlier literature did not deal with. There are notable differences between how information influences “hard” versus “easy” issues. While most attitudes are fairly stable on “easy” issues, “hard” issues, or technical issues, are much more prone to framing and concerns and new information. GM is a “hard” issue, and hence a good model for discussion here.) Zaller (1992) went even further to infer that the public is “spoon fed” its opinions by elites in society. Elites, and especially their messages disseminated in the media, can determine how the public will consider issues, and can even shape the public's opinion on complicated policies (Joslyn and Haider-Markel, 2002; Stone, 1997; Jones, 1994; Rochefort and Cobb, 1994). If in fact the public is waiting on political elites to form their opinions on such controversial issues as genetically altered foods, then moving from fear to incorporation of this technology into the mainstream ought to prove easy to facilitate.

But the evidence supporting the ease in which public information initiatives alter public opinion is not consistent. After a twenty-five-year program to reduce smoking in America, using both incentives and a concerted advertising campaign, there has been a large decrease in numbers of Americans lighting up. Nevertheless, in the years 1995-99, smoking caused 440,000 premature deaths annually (Trosclair, Adams and Rivera, 2002). In a similar vein, even given the enormous benefits and safety of modern nuclear power plants, public opposition to nuclear power persists. In Germany interest groups have pressured the government into closing many plants; however, facing a decrease in power supply, which may force Germany to import power, much of the population appears to be reconsidering such action (Petersdorff, 2000). Clearly, in a democracy (in either the U.S. or abroad), public opinion is not altogether at the mercy of public policy experts. Citizens have the ability to resist messages that are disseminated via the media and through other public channels. The anti-drug programs of the George W. Bush administration are a prime example, with some

arguing that the anti-drug ads actually increase usage rates among their target audiences (Williams, 2002). If this is true of anti-drug ads, the efficacy of ads in shaping public sentiment must be more carefully examined. How can public opinion be effectively altered? This may be especially difficult when the public holds strong preconceived positions that go counter to the information of policy experts—such as with GM foods.

The answer may lie with understanding how *framing* influences information acceptance. The public's perception of a message sent to influence its opinion is important. Zaller and Feldman (1992) have noted the strong impact framing can have on the formation of opinion. The framing of a message can determine its acceptance to the target audience, including how the issue is defined in terms of beneficiaries (Nelson and Kinder, 1996). There is also mounting evidence that the general public is responsive to framing in terms of *authorship*—who is the originator of the message (Joslyn and Haider-Markel, 2002, even go so far as to note the medium of delivery can be construed as a framing concern, though I do not investigate that here). The role of authorship framing is especially evident in the public's observation of political messages, where most people understand the nature and motive of the author to be self-glorifying (neutral “news” articles being deemed more authoritative with viewers than direct campaign ads). What are the primary framing influences that attend authorship? Does the public require relative expertise or sincerity in its assessment of public initiatives to shape its opinions?

Genetically altering foodstuffs provide great utility in this regard. Americans have strong negative feelings on genetically modified food (I will establish this in experiment one), as evidenced in the rapid growth of the organic food market. These feelings may be similar to fears over nuclear power, nuclear waste, and genetic cloning, fears that stem from a good understanding of the potential for harm brought on by technology (Three Mile Island and *Chernobyl* provide one type of reason). Even without a similar “GM” scenario, where many human lives were lost or left physically or mentally damaged, many Americans fear the use of genetic technology on things we consume—a very intimate act. But while so many Americans are very concerned about GM foods, experts, from a position of greater information, continue to advocate their usage. Even so, the public's fears are widespread and often hard to alter, making effective implementation almost impossible. How can the public be informed about the benefits of GM foods most effectively? Will the same information, disseminated strategically using informed authorship framing, make the messages more resonant with the target audiences?

## **Experiment One**

To more accurately understand the public's feelings on GM foods, I developed an experimental model to measure both perceptions of the qualities of genetically modified foods and more general attitudes about GM foods. In this first experiment, I conduct a taste test of two types of fruit, labeled “GM” and “organic.” While both were actually the same, discrepancies in perception of taste and quality generally favoring organic proved to be statistically significant.

### *Experiment One: Methodology*

This stage consisted of a taste testing and a brief, sixteen-question survey (IRB approved). On one day, for a two and a half-hour time span during lunchtimes, two separate booths invited students to participate in a voluntary taste testing survey. The booths were set up on opposite ends of campus. To avoid repetition, participants were instructed to take part only once, at only one booth. At each booth strawberries and grapes were available for taste testing. Although, students did not have to

taste both, the administrator explicitly stated that students must taste the same types of fruit (i.e., compare grapes to grapes). There were two trays on the table; both contained the two types of fruit. “Genetically Modified” labeled one tray, while “organic” labeled the other. The labeling was the only difference between the two. The fruits were as identical as possible in every other respect, having been purchased from the same delivery at a local store. In order to ensure that incidental differences in the appearance of the fruit did not influence the respondents’ perceptions, the persons administering the survey switched the trays periodically. Approximately 160 students participated in the taste testing survey (see Sears 1986 for a discussion of using college students in research of this nature).

*Findings from Experiment One*

The results of this experiment tell us a great deal. The experiment demonstrates a strong bias against consuming GM foods. The prevalent fear of GM is projected onto those foods that consumers believe to be genetically modified. It also uncovers some of the perceived benefits of GM foods, though these are limited.

In the first experiment, preconceived attitudes about the qualities of GM foods, vis-à-vis organic foods, were quite stark. In nearly every category, the respondents projected a negative attitude towards GM foods in the taste test. There was a stark consistency in the opposition to genetically modified foods in all but one area. To facilitate this discussion, I have broken the responses down into two sections. In Table 1, I list the responses to sensory perceptions. In Table 2, I list the responses to questions regarding of intrinsic value. Keeping in mind that the fruit displays were rotated on a regular basis to prevent any inadvertent influence based upon the display, there were very different perceptions of the fruit.

Table 1  
Genetically Modified Fruits: Sensory Perceptions

	Labeled Genetically Modified	Labeled Organic
<b>Before Tasting the Fruit</b>		
Which of the two would you prefer to eat?	21 (13.3)	123 (77.8)
Which of these fruits do you think will taste better?	45 (28.5)	108 (68.4)
<b>After Tasting the Fruit</b>		
After having eaten both, which do you prefer?	27 (17.1)	99 (62.7)
Which of the fruit appeared fresher?	60 (38.0)	82 (51.9)
Which of the fruit tasted fresher?	37 (23.4)	99 (62.7)

N=158, percentiles in parenthesis. Totals do not equal 158, nor percentiles 100%, as “no difference” responses were removed.

Table 1 indicates very distinct differences in respondents’ projected attitudes of GM foods. Remember that all the fruit looked, and tasted, nearly identical. Moreover, the platters were rotated in order to counter the effects of slight differences. Thus, the data from the survey should have resulted in percentages closer to 50-50.

Prior to tasting the fruit, an overwhelming majority of participants, nearly eight in ten, preferred organic foods, with only a small number preferring GM. When asked which would taste better, the number of respondents supporting GM rose to almost a third, while organic dropped slightly. This demonstrates the respondents' clear preference of organic. After tasting both fruits, the differences in percentages dropped further; however, participants still maintained a preference of organic.

Table 2  
Genetically Modified Fruits: Intrinsic Values

	Labeled GM	Labeled Organic
Which do you think has a higher nutritional value?	46 (29.1)	101 (63.9)
Which fruit do you think will stay fresher, longer?	120 (75.9)	32 (20.3)
<b>2-Part Questions</b>	<b>Yes</b>	<b>No</b>
Do you feel that one is safer to consume?	73 (46.2)	55 (34.8)
<i>Follow-up Question:</i>	<b>Genetically Modified</b>	<b>Organic</b>
Which do you feel is safer to consume?	8 (5.1)	96 (60.8)

N=158, percentiles in parenthesis. Totals do not equal 158, nor percentiles 100%, as "no difference" responses were removed.

Not only did the majority of respondents find differences in taste and in their assessment of the fruit, but they remained highly critical of genetically modified foods in general. Interestingly, an assessment of respondents' intrinsic value of GM foods clearly showed the vast majority favored public policy initiatives to clearly label GM foods, and organic foods as a corollary. The respondents wanted to know about the presence of genetic modification to their food, and it was found that this would dissuade their purchasing of it.

## Experiment Two

The second stage required each respondent to participate in three steps. In the first, a survey was administered to quantify preconceived ideas on biotechnology. Secondly, each participant read a short article that boasted the benefits of GM foods. In this part of the experiment, I crafted four different headers to reflect four separate institutions authoring the article. These were Greenpeace, the FDA, Monsanto, and AgBioWorld. Hence, each was distinct only in terms of authorship. Finally, a second survey was administered that sought to gauge any change in the participant's ideas regarding the safety, quality, worldwide benefits, etc. of GM products. By categorizing respondents by article authorship, I can then determine if authorship framing is a factor.

### *Stage Two: Methodology*

The second stage of research consisted of classroom visits, in which a total of 169 students voluntarily participated (IRB approved). Similar to stage one, in the first survey students chose

between GM and organic on issues such as nutritional value, in order to gauge their preconceived attitudes regarding the two methods of production. I used this survey as a base line for determining change.

Each student then received a two-page article clearly articulating the benefits of genetically modified foods, organized into six sections. The *Introduction* explained the prevalence of biotech products in the food industry and outlined the article's content. The next heading, *Lowering Costs*, used the following three sections to explain how GM agriculture could lower the costs of agricultural production on the environment and to the consumer as well. These three sections, *Reduced Pesticide Usage*, *Reduction in Land Use*, and *Addressing Human Health Issues*, used examples to illustrate the main thesis. Due to time constraints when administering stage two, only one paragraph from the article was dedicated specifically to the developing world's more pressing need for biotech agriculture.

The article was intended to persuade the reader that genetically modified foods were indeed beneficial to both the environment and human health. Although all the articles contained the same content, one of four different headers appeared on each article. I chose the following organizations: the U.S. Food and Drug Administration's (FDA) Center for Food Safety and Applied Nutrition, Monsanto (a private firm that produces biotech crops and pesticides), AgBioWorld (a group of reputable scientists from around the world that support biotechnology), and Greenpeace (a group that advocates environmentally friendly policy and does not support GM technology). All the headers provided a very brief description of the organization. I assigned each survey a number. The first task of the second survey was to write the article number in the upper right corner of the survey.

The final stage of experiment two was the second survey. In this survey, along with many of the same questions as the first survey, I brought to the reader's attention the organization authoring the article through the first four questions. These forced the reader to consider the organization's motives and reliability. Next, the questions turned to the content of the article. Because all the questions required an opinionated answer, the answers reflected the relative persuasiveness of the article when compared to the answers from the first survey.

### *Findings of Experiment Two*

In the second stage I observed the influence of new information on the respondents' views of the benefits of GM foods. The first survey established the preconceived ideas of the respondent and the second survey determined if the respondent's attitude changed. Furthermore, I used authorship framing to gauge the level of influence of this new information. Table 3 demonstrates the before and after attitudes of respondents' informational preferences. This chart analyzes the overall changes in respondents' attitudes without considering authorship framing. The statistics for the first four questions represent the actual respondents' answers, while the second half of the table's data expresses the means of responses. Table 4 lists four questions and then compares each question's mean response before reading to its mean response after reading an article. Table 5, similar to Table 4, compares the mean of respondents' answers before reading the article to their responses after reading the article. However, these two tables polled respondents using different scales. The final analysis, Table 6, measures respondents' perception of the author.

Table 3  
Genetically Modified Fruits: Informational Preferences

	Before reading the new Information		After reading the new information	
	Organic	GM	Organic	GM
Which of the two has a higher nutritional value?	110 (65.1)	34 (20.1)	38 (22..5)	92 (54.4)
Which do you think will stay fresher longer?	13 (7.7)	140 (82.8)	7 (4.1)	154 (91.1)
Which do you feel would be safer to consume?	110 (65.1)	8 (4.7)	78 (46.2)	31 (18.3)
Which of the two would be better for you?	133 (78.7)	15 (8.9)	61 (36.1)	66 (39.1)

On a scale of 0-10, 0 being “no” and 10 being “yes”

	Mean before reading the new information	Mean after reading the new information
Do you think GM foods should be used to alleviate global health issues?	5.92	6.33
	Mean difference .41*	
Do you believe Biotechnology is a positive development in agro-science?	6.75	7.14
	Mean difference .39*	
Do you believe Biotechnology can be used to reduce the cost of agricultural production?	7.01	7.06
	Mean difference .05	

N=169, percentiles in parenthesis. \*\*\* p< .001, \*\*p<.01, \*p<.05 two tailed test.

Table 3 dramatically demonstrates strong and significant changes in respondents’ attitudes concerning GM foods after reading the informational article. The most profound shift occurred in the first question concerning GM’s nutritional value. The majority attitude reversed after reading the article. Not too much change took place in the second question. In the first survey respondents on the whole took the same position as the article, that GM foods stayed fresher longer. A noteworthy change arose in the third question. When asked which is safer to consume, only a tiny faction of respondents chose GM, but after reading the article the percentage almost quadrupled.

Another large shift occurred in the question on which would be “better for you.” Prior to reading the article, respondents showed an eight to one preference of organic. After reading the article, this changed to a fifty-fifty distribution. The most significant changes occurred when handling nutritional issues, where students clearly trusted authority figures. The second portion of this table measured responses on a scale of 0 (no) through 10 (yes), with respondents taking more favorable positions toward GM technology after reading the article.

These results are not altogether surprising, although the strong shifts observed were greater than I expected. But the most interesting information comes in the next analysis, where I break the respondents into the four authorship groups. In this section, I look to see how authorship framing influences the readers’ incorporation of the new information into their responses. In Table 4, I have calculated mean answers such that “0” indicates organic and “1” indicates GM. In this way, the higher the mean, the more respondents indicated GM in their responses. Because the article is intended to convince the respondent of the value of GM foods, I expect to find higher mean scores *after* the respondents have read the article.

Table 4  
Comparisons of Means Prior to Reading and by Author After Reading

	Before reading	FDA	Green-peace	AgBio-World	Monsanto
Which has a higher nutritional value?	.236 (144)	.735 (34)	.778 (36)	.767 (30)	.552 (29)
Which do you think will stay fresher longer?	.920 (153)	.907 (43)	.979 (47)	.974 (38)	.969 (32)
Which do you feel would be safer to consume?	.007 (118)	.200 (30)	.344 (32)	.440 (25)	.143 (21)
Which would be better for you?	.101 (148)	.500 (34)	.528 (36)	.643 (28)	.429 (28)

“N” in parenthesis. Totals do not equal 169 as “no difference” responses were removed.

In Table 5, again I look at the change in responses before and after reading the articles provided. And again, I look at the results by authorship to measure the impact of authorship framing to measure which author had the greatest impact in changing respondents’ opinions. This table demonstrates the significant level of impact made by each article. Monsanto, in three of the four questions, yielded the least change in attitude. Interestingly, respondents to the FDA article showed a lower mean after reading the article than before. Greenpeace appears to be a trusted authority, as its means display the highest change in the first two questions. Also, this data reveals AgBioWorld’s ability to alter public perception in that its means increased by the widest margin when considering all the questions in this table.

Table 5  
Comparisons of Means Prior to Reading and by Author After Reading

	Before reading	FDA	Green- peace	AgBio- World	Monsanto
Do you think GM foods should be used to alleviate global health issues?	5.92 (169)	6.35 (46)	6.23 (47)	7.21 (38)	5.54 (35)
Do you Biotechnology is a positive development in agro-science?	6.75 (169)	7.51 (45)	6.83 (48)	7.71 (38)	6.51 (35)
Do you believe biotechnology can be used to reduce the cost of agricultural production?	7.01 (169)	6.98 (46)	7.15 (48)	7.29 (38)	6.80 (35)

“N” in parenthesis.

Again, these questions are gauged on a 0 through 10 scale. “0” denotes no to the question and “10” denotes yes. This table concerns broader, more global questions than the previous tables. The first question deal with global health and the next two concern the agricultural sector as a whole.

Several interesting conclusions can be drawn from this data set regarding authorship. For each question, the Monsanto article caused a decrease in mean, which may indicate distrust of Monsanto’s information and/or motives. AgBioWorld, similarly demonstrated in Table 4, leads the other authors in persuasiveness, having the largest increases in means. It is also interesting to note that the mean for the last question, concerning GM foods’ ability to reduce the costs of agricultural production, decreased for the FDA as well as Monsanto. In addition, the means for this last question stayed relatively steady (increasing slightly or decreasing slightly), denoting students’ skepticism that costs could actually decrease.

The questions in Table 6 appeared at the beginning of the second survey, thus focusing the respondents’ attention on the author of the article. With the authorship framework established, the answers to subsequent questions reflected the author’s ability to influence on the participants’ attitude. Therefore, the questions illustrated in Table 6 reflect the participants’ perception of the author and should correlate to the change in mean observed.

Not surprisingly, Monsanto, the private biotech firm, received the lowest means for each question. This lack of trust is demonstrated throughout the tables. Students were still influenced by Monsanto’s article, but definitely not at the same rate at which the other authors influenced students’ perceptions.

AgBioWorld received the highest means for the first question, demonstrating students’ belief that expert scientific knowledge made the best case for biotechnology. On the other hand, while AgBioWorld scored comparably high for each question, the data in Table 6 shows that students trusted the FDA’s reliability and motive more than the scientists’. Nevertheless, all four authors received low answers (no mean exceeded five) from students concerning the author’s bias.

Table 6  
Comparisons of Means by Author: Measures of Perception of Author

	FDA	Green- peace	AgBio World	Monsanto
Do you feel that the author has made a good case that biotechnology lessens the harmful effects of agriculture on the environment?	7.61 (46)	7.21 (48)	7.97 (38)	6.86 (35)
Do you trust that the information presented in this article is reliable?	7.30 (46)	6.81 (48)	6.87 (38)	5.91 (35)
Do you feel that the author is unbiased in the presentation of the material?	4.48 (46)	3.00 (48)	4.29 (38)	2.60 (35)
Do you think that the author's primary concern is the public good?	6.07 (46)	6.52 (48)	5.55 (38)	4.83 (35)

"N" in parenthesis. Totals do not equal 169 as "no difference" responses were removed.

### Conclusion

Public policy campaigns in America have been successful in several areas, though not universally so. This research has shed light on how public policy advocates can influence American public opinion. It appears that demonstrating expertise assures a respondent of the author's reliability. While this may be necessary, it is not always sufficient. Respondents draw heavily on their perception of the author's motive and bias, which is evidenced in the above tables and analyses.

Although this study yielded significant results, especially for the first experiment, more extensive data is necessary. I plan, perhaps in graduate school, to conduct further research in the second experiment, expanding my subject pool to incorporate a larger population.

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