

Cases for Teaching Responsible Communication of Science

Genetically-Modified Headlines: Role play version

An ecological research article is published in the academic journal *Proceedings of the National Academy of Sciences* suggesting that genetically modified (GM) corn harms insects called caddisflies in nearby streams. A group of crop scientists immediately and strongly criticize the appropriateness of the article, in part for its potential to be taken out of context and used by partisan advocates. At the same time, the university press office contacts the authors of the research article with an opportunity to promote their study in the mass media by issuing a press release. Universities routinely publicize research that is published in prestigious journals such as this. Should the authors agree to issue a press release? If so, how should they present their controversial work to the general public? When, if ever, can researchers appropriately be held responsible for the social impacts that result from their public communication with the media?

Your task in this case study is to take a side on these and related questions. You will be assigned to a group which will role-play one of three character positions. All characters will be participating in a mock conference call to help the authors of the journal article decide how to answer these questions. During the mock conference call, you will be responsible for making the best possible case for your character's positions. You should include as many different arguments as you can and aim to make your case persuasive to other participants.

The specific background materials for each of the three character positions lists three specific questions. You should be prepared to take a stand on each of them. But there may be other issues that need to be addressed before decisions can appropriately be made. Do not let the issues identified limit your imagination.

Readings associated with each character are suggested and may be helpful as you formulate your arguments. But again, you are in no way limited to the arguments included in these readings. Use your creativity to formulate arguments of your own and to adopt fully the perspective of the character you have been assigned to role-play.

A note about realism: The background of this case is based on actual events and interviews with those involved. The characters in the case, however, do not represent real individuals. In this case packet, their statements have been recombined to produce three divergent positions. Your in-class debate is therefore likely to be more vigorous than might occur in real life.

Table of Contents

This case pack includes:

- Class Procedure: a detailed outline of each step of the exercise
- General Background Information on the case, for all groups
- Working Draft of the press release
- Overview of the three Character Positions
- Specific Background Materials for students in each group

Class Procedure: What to Expect

1. Set-up (~10-15 minutes, to be done in class). Your class will be divided into three groups. Each group will be assigned to represent one of the three character positions in the case. Make sure that you and your group members understand your task and your role.

2. Individual preparation (~60 minutes, to be done outside class as homework). Read the general background information explaining the context for the situation and the introduction to the three character positions. Read the specific background materials on the character position you represent to find three specific questions that should be explored in the class debate. You may want to read the specific background materials for the other character positions, too, to see what they are going to argue. You should also do some Internet research to build additional arguments not present in the case study itself. Your instructor may have assigned additional homework and readings.

Use all this information to prepare one to three arguments that support your position that can be used in your group debate. Arguments may be prepared in “bullet point” style, but should have enough detail that other group members can read and understand.

3. Group preparation (~10-15 minutes, to be done in class). Work with your group to synthesize the individual arguments each student created and discuss how they can work together to form a strong position relative to the three specific questions driving the debate. Create a 5-minute opening statement where your group will introduce its major arguments. During this planning process, you might decide who will speak in what order or which group member will present which arguments. Note that *all* group members should be actively involved in the group presentation, and *every* group member should present some part of the argument.

4. The mock conference call (~40-60 minutes). Each group will be given 5 minutes for its opening statement followed by 5-10 minutes to respond to questions from the other groups. The Authors will go first to outline their initial thoughts on the questions. The Critics will go second to argue for their position. The Public Information Officers will go third to argue for their position. Finally, the Authors will take the floor again to ask advice or clarifying questions from the other groups about the decisions they must make. Then the Author group receives a few minutes to discuss among before announcing their decisions and justifications regarding the three specific questions identified.

5. Debriefing (~15-20 minutes). After the Author group announces their decisions, you are divorced from your assigned role and the instructor will lead the group in a discussion of what you really think after the debate. Finally, the instructor will reveal the actual outcome of what really happened and you will be allowed to continue to reflect on your experience for a broader discussion of the issues.

General Background Information

Even though the majority of all commodity crops planted in the U.S. are genetically modified (GM), public sentiment remains deeply divided about the acceptance of GM crops. The pro-GM side argues that GM crops produce more food to feed a growing population, require less land devoted to agriculture, reduce the reliance on chemical pesticides and pose no risk for human consumption. The anti-GM side argues that GM crops may have unknown, and potentially negative, impacts on animals and ecosystems and that they benefit the agricultural-industrial complex more than they benefit farmers, consumers or the environment.

Many scientists are frustrated that the debate seems to have resorted to using science as ammunition, cherry-picking results that support a particular viewpoint rather than considering the results within the larger scientific context. More troubling is when these unrepresentative studies end up influencing policy decisions in directions not supported by the scientific consensus.

One historical example involves a preliminary study published in 1999 finding that pollen from GM corn may harm Monarch butterflies. Subsequent studies eventually found the harm to be negligible, but the newsworthy findings were picked up by the media, worked into propaganda by anti-GM advocacy groups, and led to widespread fears regarding GM corn. Because the future of GM crops, as well as most scientific research, depends on either governmental funding or public support, this influence of the media is not negligible.

More recently, a group of ecologists conducted research funded by the National Science Foundation finding that GM corn harms caddisflies in streams. Their results were accepted for publication in the peer-reviewed and prestigious academic journal *Proceedings of the National Academy of Sciences* under the title *Toxins in transgenic crop byproducts may affect headwater stream ecosystems*. This journal is primarily read by academic researchers and occasionally industry representatives related to the topic – very rarely will the general public have reason to read it.

Even though this study represented the first time these ecologist authors had explored any GM-related context, they realized their findings were controversial and expected a response from industry. They were surprised when the strongest and most heated responses came from other researchers within academia -- mostly crop scientists. In multiple emails and blog posts on the Internet, these critics attacked the appropriateness of the article. While the science itself was also critiqued, the biggest fear was in how the public and policy-makers might interpret the results toward political agendas.

One point of contention was the possible misuse of last sentence of the published abstract, which reads, “widespread planting of [GM] crops has unexpected ecosystem-scale consequences.” The critics claim that this statement implies too much certainty and the phrase “ecosystem-scale” goes beyond what the data demonstrate. The authors contend that even if that statement implies too much certainty, the title and rest of the article emphasize that such consequences are possibilities, and the phrase “ecosystem-scale” is accurate for the ecological context in which the intended audience of ecologists would interpret it.

In summary, the critics argue that accuracy is not enough when communicating science within controversial contexts. Scientists must consider how others may use the information for political gain and attempt to counter such manipulation by their own communication choices.

In the following fictionalized case study, it is three days after the published journal article became available to read. The critics have already begun attacking the appropriateness of the article. The authors of the journal article receive an email from their university public-information officers asking them to consider working together to draft and issue a press release to the media to publicize their recent journal publication. As participants in the case study, you will have the chance debate one another to influence this decision.

Press releases are common and strategic communication tools organizations such as universities use to increase their prominence as well disseminate information. They are written to attract the attention of the mainstream media, which will hopefully publish the press release, or some version of it, to their audiences. Usually, public-information officers within the news agency of a university work with the researchers to accurately convey the essence of the research in a form that will also capture the attention of the general public.

Researchers can benefit from having their work shared via press releases. Universities want to issue press releases. Journalist and other media practitioners want to receive press releases. And if written well, the general public wants to read press releases. In this case, the critics do NOT want a press release issued. They have also emailed the authors explaining their concerns.

The authors have to make a decision – do they agree to publish a press release, and if so, how do they appropriately communicate their results to the general public? In an attempt to help them sort through these questions, the authors have arranged a conference call with the public-information officers and their critics to discuss the issue. The in-class debate represents this conference call. At the end of the debate, the authors will be expected to answer these questions and justify their responses.

Working Draft of the Press Release

Memo from the Public Information Officers to the Authors:

In the abstract of your published article, you state, “widespread planting of [GM] crops has unexpected ecosystem-scale consequences.” From this, we have drafted a few potential verb and target options to construct the headline and lead sentence of your press releases based on how you want to present these results to the public. Pick one of each and you’ll have your headline and lead sentence finished! The remainder of the draft press release follows.

<i>Headline:</i>	Verb Options	Target Options
Genetically Engineered Corn	(a) Harms...	(a) ...Aquatic Ecosystems
	(b) May Harm...	(b) ...Beneficial Insects
	(c) Affects...	(c) ...Caddisflies
	(d) May Affect...	
	(e) Has Unknown Impact on...	

Lead Sentence:

A study by environmental science professors suggests a widely planted variety of genetically engineered corn [insert verb option here] [insert target option here].

Remainder of Press Release:

Researchers established that pollen and other plant parts containing toxins from certain genetically engineered GM corn are washing into streams near cornfields.

They also conducted laboratory trials that found consumption of GM corn byproducts produced increased mortality and reduced growth in caddisflies, aquatic insects that are related to the pests targeted by the toxin in GM corn.

Caddisflies, the researchers say, "are a food resource for higher organisms like fish and amphibians. And, if our goal is to have healthy, functioning ecosystems, we need to protect all the parts. Water resources are something we depend on greatly."

Before licensing GM corn, the U.S. Environmental Protection Agency conducted trials to test its impact on water biota. But it used *Daphnia*, a crustacean commonly used for toxicity tests, and not insects that are more closely related to the target pests, the researchers say.

"Every new technology comes with some benefits and some risks," the researchers said. "I think probably the risks associated with widespread planting of GM corn were not fully assessed."

Introduction to the Three Character Positions

Authors

- You are some of the nine ecologists that wrote and published the original 2007 article entitled *Toxins in transgenic crop byproducts may affect headwater stream ecosystems* in the prestigious journal *Proceedings of the National Academy of Sciences*.
- The Critics have strongly criticized the appropriateness of your published journal article because of its potential to be taken out of context and used by political advocates opposed to genetically-modified (GM) crops.
- You have been contacted by the Public Information Officers to see if you would be interested in working with them to issue a press release to the media publicizing your recent study.
- You feel you should not be criticized for the possibility that others might misuse what you have published in an academic journal article. However, you don't know what to think about your responsibility when it comes to actively seeking attention outside of academic channels in the mass media.
- You have arranged a conference call with the other two groups to help you decide what to do.

Critics

- You are a group of crop scientists who have come together in an attempt to counter the likely political response to the published journal article.
- You feel it is the responsibility of scientists to modify their communication in controversial contexts to head-off potential misuse and you criticized the Authors for not doing so in their published article.
- You are especially critical of the last sentence of the abstract, which reads, "widespread planting of [GM] crops has unexpected ecosystem-scale consequences." You claim this is easily misinterpreted.
- You do not have ties to the GM industry and so are not acting out of monetary gain but because you think the majority of research shows that GM crops are beneficial to society.
- Your basic position is that because the media will likely sensationalize results that are already stated in an inappropriate manner, a press release should NOT be issued to avoid drawing attention to the work and disseminating it farther.

Public Information Officers

- You are public information officers who routinely work with scientists to issue press releases to the media and general public.
- You have contacted the authors to see if they would be willing to work with you to draft and issue a press release to the media publicizing their recent article.
- You have written a draft press release highlighting some options for the headline and lead sentence and sent it to the Authors for their comments.
- Press releases need to be written in an attention-getting manner or there is no point in writing them.
- Your basic position is that communicating science to the public is beneficial to society and the solution to misunderstanding is more communication, not less.

Specific Background Materials for the Author Group

You have organized the current conference call with both the Critics of your published journal article and your university Public Information Officers to help you answer the following questions:

- Do you agree to work with the public-information officers to issue a press release about your published journal article to the media?
- If so, how should you present your results to a general audience in the headline and lead sentence?
- When, if ever, can researchers appropriately be held responsible for the social impacts that result from their public communication with the media?

The published journal article in question represents your first study looking at a GM context. Before conducting the research, you knew that the topic would be controversial. In fact, you believe that often it is precisely at controversial issues that research should be directed, because those are the areas that truly matter within society. In addition, funding agencies often direct greater amounts of money toward controversial areas, so it is likely that the controversial context is one of the reasons that your research received support from the National Science Foundation, a federal funding source, in the first place.

After publication of the journal article, the Critics argued strongly that publishing the research was inappropriate. While some of the criticism focused on the science itself, the biggest fear was that advocates opposed to GM crops would use the results out of context to manipulate policy decisions in favor of their viewpoints. In particular, the Critics claimed that the last sentence of the abstract, which reads, “widespread planting of [GM] crops has unexpected ecosystem-scale consequences,” goes too far in its interpretation and could easily be decontextualized by advocacy groups and misinterpreted by the public.

You feel that even if that phrase implies too much certainty, the title and rest of the article emphasize that such consequences are possibilities and the article taken as a whole does not go too far in its interpretation. Likewise, your article was written for other ecologists whom you believe would interpret “ecosystem-scale” as you intended – namely the interaction between multiple ecosystems, such as cropland and waterways. The critics, who were crop scientists and not ecologists, wrongly interpreted “ecosystem-scale” to mean that the impact of GM-crops moved from caddisflies up the food chain. Regardless of their interpretation, you claim “ecosystem-scale” remains an accurate description of your data.

In general, the Critics argue that scientists must consider how others may use the information for political gain and attempt to counter such manipulation by their own communication choices.

You disagree. You believe your job is to conduct the research, report accurately what you did and then stand behind the work. You feel it is impossible to control how others use your communication after the fact and it is not fair to expect scientists to shoulder the blame for others using their communication inappropriately.

This is what you believe for publication in academic journals read by mostly other academics and select industry representatives. You’re unsure what to think about when actively trying to engage the media and public with a press release. On one hand, you are neither pro- nor anti-GM and have no dog in the fight politically. Your words cannot be hijacked by others when you have no agenda in the first place.

You have previously supported public science communication by participating in public talks and other engagement activities with the public, and on a philosophical level you feel the public should be informed about science whenever possible. The research was also federally funded with tax dollars, so you also feel the public has a right to know what they have paid for.

Issuing a press release will benefit you professionally, both through increased prominence and potentially more citations, and your new dean is pushing to get more press releases about your university's researchers into the media.

On the other hand, you hadn't considered a press release before being contacted by your public information officers and don't want to rush into a decision without considering the consequences.

As the Author Group, your task is to participate in and use the class debate to arrive at answers and justifications regarding the three questions posed in this case study. You will be the first to present your thoughts, so use this time to argue what you believe and articulate what information you will hope to receive from the other groups before making your final decision. After the last group has presented, you will be given a few minutes to confer with your group and then you will announce and justify your answers to the three questions.

Specific Background Materials for the Critics Group

You are about to participate in a conference call with the Authors of the published journal article that you have critiqued and their university Public Information Officers to help them answer the following questions:

- Do the Authors agree to work with the public-information officers to issue a press release about their published journal article to the media?
- If so, how should the Authors present their results to a general audience in the headline and lead sentence?
- When, if ever, can researchers appropriately be held responsible for the social impacts that result from their public communication with the media?

Your position is that a press release should not be issued. If it is issued, the headline and lead sentence should be as conservatively worded as possible. In general, researchers should be held responsible for any outcomes of their public communication choices.

You are mostly senior researchers and have worked in a GM-context for most of your academic careers. You are not funded by industry nor will you benefit monetarily from increased public acceptance of GM crops. However, over the years you have witnessed many politically naïve scientists have their work sensationalized in the media and manipulated by advocacy groups to end up supporting a political agenda they do not agree with.

The previously mentioned monarch butterfly study comes to mind as an unfortunate example that was hijacked in such a way to lead to fears and policy changes regarding GM corn that were not supported by the science and have taken years to overcome. There have been many other examples. In general, you argue that scientists must consider how others may use the information for political gain and attempt to counter such manipulation by their own communication choices.

You consider the current authors to be careless by including in their published journal article passages that could easily be decontextualized by advocacy groups, sensationalized in the media or misinterpreted by the public. In particular, you feel the last sentence of the abstract, which reads, “widespread planting of [GM] crops has unexpected ecosystem-scale consequences,” implies too much certainty. Likewise, you feel the phrase “ecosystem-scale” goes beyond what the study actually observed because it implies an entire ecosystem is under threat, when in fact the study looked at only one small part of the ecosystem -- caddisflies.

You do not believe that the Authors are attempting to manipulate policy. Rather, you believe through their carelessness, they will be manipulated by partisan advocates to appear supportive of their agenda. The article therefore is potentially just as dangerous as the earlier monarch butterfly study and you consider it inappropriate for the Authors to actively promote such an article to a wider audience through a press release. You are certain the media will sensationalize the results, playing up controversy, generalizing from single anecdotes and highlighting inflammatory quotes – all aspects that hinder the understanding of science.

The journal in which the authors published their work already releases “tipsheets” to the media about upcoming articles. Therefore, you think that if the authors issue their own press release, they are going beyond simple dissemination of information to blatant self-promotion with no concern for political ramifications.

You do think press releases in general are good if they serve the public interest, and you think scientists should strive to communicate accurate science to the public. However, press releases stop being beneficial if they harm the greater good, as you think will happen when the media sensationalizes and the anti-GM groups propagandize this one.

Likewise, you do not want researchers to stop investigating or publishing about negative impacts of GM crops. Rather, you want to keep preliminary evidence within science where it belongs, and not out in the media where science devolves into damaging political ammunition.

As the Critic Group, your task is to use the class debate to convince the Author group to align with your positions outlined at the beginning of this backgrounder. You will be the second group to present.

Specific Background Materials for the Public Information Officers Group

You are about to participate in a conference call with the Authors of the published journal article and the Critics that critiqued their article to help the Authors answer the following questions:

- Do the Authors agree to work with the public-information officers to issue a press release about their published journal article to the media?
- If so, how should the Authors present their results to a general audience in the headline and lead sentence?
- When, if ever, can researchers appropriately be held responsible for the social impacts that result from their public communication with the media?

Your position is that yes, a press release should be issued. The headline and lead sentences need to remain accurate, but should be as attention grabbing as possible to increase the chances of being picked up in the media. In general, researchers should not be held responsible for the outcomes of their public communication except for extreme circumstances.

You are the staff of the university's news office that specializes in managing the public face of the university and promoting it within the media. One of the common tactics for doing so is by issuing press releases that will hopefully be picked up and covered by the media. Many of you started your careers as mainstream journalists before moving to public relations and therefore have a well-grounded foundation in how the media work and what the media look for in potential press releases.

Issuing a press release after getting published in a prestigious journal is a common and often expected activity. Some researchers shy away from press releases because they don't want to "water down" their research or they are worried about their research being misinterpreted, or simply because they don't want to spend the time to do so. However, promoting research successes makes researchers look good, the departments that employ the researchers look good, and the university itself look good. Additionally, attention in the mainstream media has been shown to correlate with increased citation rates for researchers.

Beyond these strategic goals, you also believe that communicating science to the public benefits society as a whole. Press releases and media coverage make science interesting and understandable to the general public so that they can better make informed decisions about issues that matter to them. If research is relevant to policy, it is even more important that the public hear about it.

However, the state of journalism today presents challenges to public information officers. There are more public information officers issuing more press releases about science and fewer science reporters to incorporate them into the mainstream media. Many reporters receive over 200 press releases a day, and only have time to cover a handful. The Internet allows public information officers a platform to reach the public directly, but without the credibility that the public grants to mainstream media coverage.

It therefore becomes imperative to position a potential press release in the most attention-grabbing light to cut through the clutter. The best way to do that is to align the research with some of the longstanding news values that journalists know will attract an audience: conflict, direct impact to the reader, novelty, timely events, involvement of prominent individuals and local relevance. Readers generally only read the headline and up to 10 words of the lead sentence before deciding if they are interested enough to continue. Headlines and the lead sentence,

therefore, need to be direct, immediately engaging, and devoid of any words or ideas that may be confusing or otherwise slow comprehension of the main idea.

Your office issues about 20 to 30 press releases a week and your university has a new dean that has tasked you with being more aggressive in promoting the university in the media. You initiated contact with the Authors at the request of their departmental marketing and communication director asking if they would like to work with you to issue a press release. You wrote and sent them a draft release for their comments. You also generated a few potential quotes based on the article itself to get things started.

You are aware of the controversy that has surrounded the publication of the original journal article but do not think that the mere possibility of misinterpretation warrants not promoting this research. However, knowing the Authors may be wary, you have suggested various options for the headline and first sentence in your draft press release along a continuum of certainty. Nevertheless, you have always thought the solution to misunderstanding is not less communication, but more and better communication.

You always work with researchers to ensure any press release is accurate, but you often have to remind them that being accurate isn't enough -- a press release also needs to be attention-grabbing to have a chance of being picked up by the media or there is little point in writing it in the first place.

As the Public Information Officers Group, your task is to use the class debate to convince the Author group to align with your positions outlined at the beginning of this backgrounder. You will be the third group to present.