Communicating science through the media

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3 Communicating science through the media

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The Zurich-Basel Plant Science Center is a competence center linking and supporting the plant science research community of the University of Zurich, ETH Zurich and the University of Basel. The center promotes plant science research and education and provides platforms for interactions with peers, policymakers, industry, stakeholders and the general public.

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Authors and chapters

THEORY
Pasotti, Paschke and Pfisterer
Communicating through the media

TOOLS
Pasotti and Pfisterer
Distilling your story
Writing a press release
Giving an interview
Elevator pitch

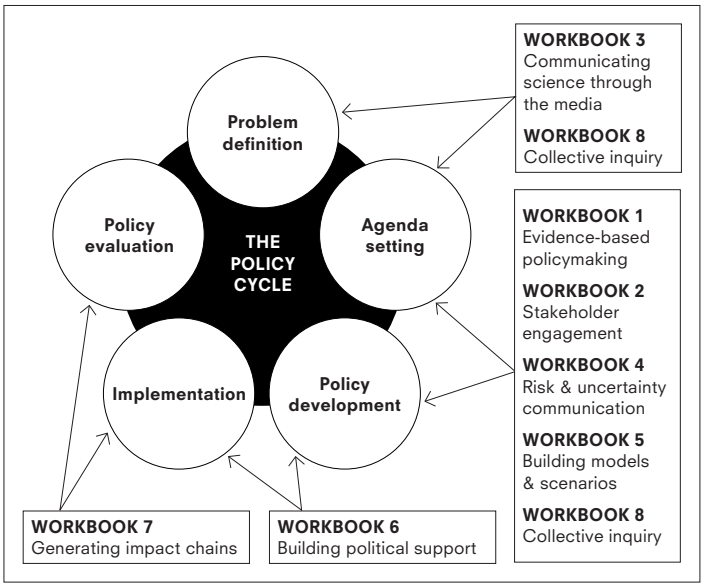
Contents

Editorial

Academic researchers can play an important consultative role in enabling policymakers to properly assess science for policy options and in promoting informed decisions by citizens. By engaging with actors beyond the research community, either directly or via science organizations or the media, scientists can enhance the impact of their research in the domain of policy.

This workbook is the third in a series of eight workbooks exploring the role of scientists in the science-policy dialogue. In workbook 3 we concentrate on how scientists can communicate science through the media: classical media, as well as social media. Mass media and journalists are institutional gatekeepers in the policymaking process, mainly through selection, as well as through the framing of information. The media act as translators between government actions and public attitudes. In order to maximize the chances of getting research to the media, scientists have to provide information in a timely and targeted manner.

FIGURE 1 — The policy cycle.



MORE READING
M. Paschke (2019). Introduction to science in policy. In: Paschke, M. and Dahinden, M. (eds.). Engaging in the science-policy dialogue. Workbook 1. Evidence-based policymaking. Zurich: Zurich-Basel Plant Science Center.

Guide to workbook 3

The aim

Workbook 3 introduces you to methods, tools and competencies useful for the communication with and through the media.

Competencies

- You will know the essentials for dealing and communicating with the media.
- You will improve your communication skills in writing and speaking to reach broad audiences.
- You will learn how to communicate scientific results in plain language.
- You will learn how to distill your story and to write a press release.
- You will learn how to give an interview.

How to read this workbook

THEORY
We will discuss the role of media in the political system. We will introduce you to the concept of framing, show you how to distill your message for different audiences and how to communicate it to journalists and the media. We will also focus on the role of social media that can bypass the institutionalized gatekeeper function of the traditional media. We will discuss the use of social media and how they have changed our understanding of the science-policy dialogue. We will explain how science can communicate through social media to different audiences.

TOOLS

In this section we introduce some of the basic tools for media work such as:

- Distilling your story
- Press release
- Giving an interview
- Elevator pitch

1. THEORY of communicating science through the media

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1.1. Why reach out?

Is there any intrinsic reason, apart from the increasing obligation imposed by funding organizations and research institutions to invest in outreach and communication? Why scientists should reach out? This is a question worth considering individually. Motivations may vary with time and range, from increasing the support for or fascination with science, inspiring learning and enhancing ones' own career, through promoting informed discussions and decisions, to be recognized as a reliable information source or increasing the impact of research.

Past science communication efforts, summarized under the heading of the **public understanding of science,** were based on the belief that scientists just had to inform the public in understandable ways in order to accomplish greater acceptance and uptake of scientific findings. This concept, based on a **deficit model** of the relation between the public and science, was based on the premises that:

- Science defines the state of knowledge.
- Scientific results are usually simplified in order to be passed on to the public.
- More knowledge leads to more acceptance (Bleicher and David, 2015).

Concepts such as **science in dialogue** and **public engagement with science** have increasingly replaced the deficit model. Here communication is seen as a two-way dialogue with mutual learning opportunities (Leshner, 2003). Social debate and social valorization of knowledge increases social robustness (Novotony et al., 2001).

Investing in communication activities can be rewarding for scientists, as it can give them a broader perspective on their own research and help develop new ideas through exposure to non-expert audiences. Additionally, engaging in communication activities, especially in the social media increases the visibility of research.

1.1.1. The role of the media

Let us look at the relationship between research, the media and the wider public. The media's description of reality shapes peoples' minds and the public perception of reality. Topics discussed in the media influence human behavior and public opinion and conversely topics not present in the media are less relevant to the public and thus often also to policymakers.

The media have a social function in society and for democracy. They are a social system alongside politics, economics, law, science, education, religion and art. Media and journalism offer services to the other systems and in particular to the political system. They connect these other social systems by (Wyss, 2011):

- Connecting, translating and reviewing information from the other social systems.
- Presenting diverse perspectives.
- Triggering resonances in the other systems: concern, irritation and follow-up communication.
- Enabling self-monitoring and synchronization of the other systems.

In order to fulfill these tasks, media should be autonomous, fact-based, transparent and timely.

1.1.2. The media in the policy cycle

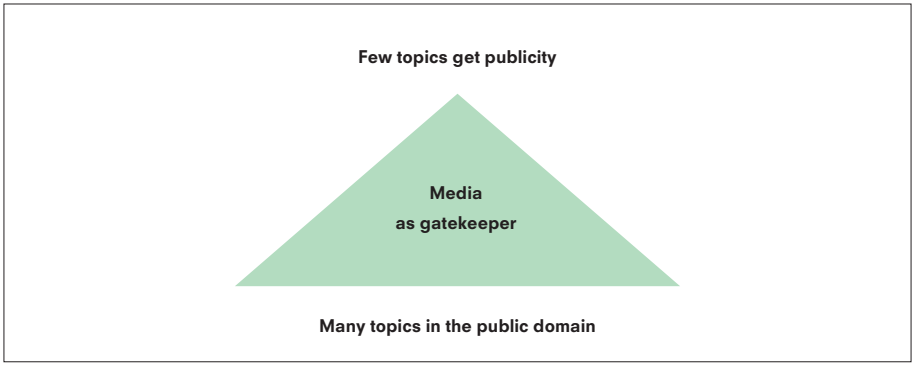
Communication via the mass media is one of the drivers for raising awareness, agenda setting and generating public support for certain topics. The media can be regarded as an important policy player throughout. At the agenda setting stage, the media decide what issues enter public discourse. They can draw public attention onto a particular policy issue. During the policy development phase, parties and interest groups come forward with controversial proposals for solutions and compete for public consent via the media.

The media act as gatekeepers in the policy process (Shoemaker et al., 1996). In the case of controversial and complex issues, the media provide an open arena for both governmental actors and civil society, with political, economic and scientific actors playing a role in between (Jarren and Donges, 2011). In the case of controversial issues and voting, it is crucial that journalists and the media reflect the prevailing diversity of opinion. However, the media cannot reflect reality objectively; they are involved in the social construction of topics through topic selection, prioritization and emphasis in reporting and evaluations of actors' opinions. In effect the media's essential influence on a debate is by framing the issue (Bonfadelli, 2012).

The media act as translators between government actions and public attitudes.

> Indeed, mass media are in the unique position of having a regular, marked impact on policy, but from outside the formal political sphere, often without even being recognized as a policy player. — Soroka et al., 2012: 204.

FIGURE 2 — Mass media are gatekeepers. They select what information gets publicity.



The media landscape and the role of the media is changing with the influence of social media. The gatekeeper position of mass media is decreasing and information is becoming more scattered and isolated but also more targeted to individual needs.

The media connect to the perspectives represented by actors. The media present these perspectives as frames. Frames are narratives that allow lay audiences to connect to problems or information by positioning them in their mental models or world views. Values and norms, beliefs and attitudes, interests, as well as prior knowledge about a topic compose mental models. Frames set by the media offer interpretative patterns that can be accepted or refused.

EXAMPLE 1
Communication about genetically modified crop plants

Controversy in public opinion around genetically modified (GM) crop plants in agriculture has resulted in bans on GM crop plants in several European countries. Questions about the role of the media in the public debate in Switzerland have been whether the media equitably and appropriately represents the prevailing opinion spectrum and the attitudes and interests of the relevant actors. Actor constellations have been: agro-industry, scientists and various political actors as promoters, small farmers and NGOs as opponents. (Table 1). According to a media analysis by Bonfadelli (2012) of the debate before the 2005 moratorium, the media reflected the opinion spectrum of the different actors adequately, however slightly against genetic engineering. They acted as mediators in the debate.

Besides the question whether the media represent different frames and opinions adequately, we also have to ask whether public attitudes are changed or influenced through the media. The media must transparently declare their position as actors in the debate: as either neutral or involved. Vigani (2017) has described factors that might increase or decrease the influence of the media on public attitudes toward GM:

- Reputation and trust of the public toward the media: does the public trust the institutions and information sources or does it rate sources as promoting biased information or protecting the interests of specific actors?
- What are prior attitudes of the public toward GM crop plants? People select and interpret information on the basis of what they believe or know.
- Heterogeneity in media reporting will result in heterogeneity of public opinion.

- Does the media highlight the risks involved? Are the possible benefits and safety of GM crop plants adequately communicated and discussed? High frequency communication of risks and uncertainties will increase people's recognition of a risk as high and probable even if science interprets it as low (Wardekker et al., 2013).

TABLE 1 — Frames and policy actors reported by the media. Adapted from Bonfadelli, 2012.

Policy actors	Role	Frame
Industry **Scientific experts in biotechnology**	Promoter	GM crop plants as economic success and as an aspect of scientific progress.
Small scale farmers **Non-governmental organizations** **Consumers**	Opponent	Unforeseeable environmental risks and uncertainty of science. Ethical controversies. Health risks associated with GM crop plants not properly tested. Consumers expect transparent labeling to choose between GM and non-GM food products.
Retailers	Waiting	Transparency about GM products, non-GM products and consumers' choice.

EXAMPLE 2
Climate change communication

In climate change communication, framing is an important topic. O'Neill et al., 2015 have described at least 9 different frames frequently used in climate change communication.

TABLE 2 — Frames used in climate change communication. Adapted from O'Neill et al., 2015.

Frame	Brief description
Scientific consensus	Emphasis is on the science of climate change and the broad expert consensus and need for action.
Political or ideological struggle	A conflict over the way politics should act to address climate change. A battle for power between nations and personalities.
Role of science	Are scientific institutions qualified and legitimated to steer climate change adaptation and mitigation? How can transparency be guaranteed and public awareness and engagement be increased? How should funding to these institutions be handled?
Uncertainty of science	Focus on uncertainty in climate science relating to impacts or solutions. Discussion on anthropogenic nature of climate change and on role of natural variability.
Disaster	Predicted impacts of climate change threaten all aspects of life. The impacts of climate change will get worse. Politics and society are not well prepared.
Security	Climate change threatens human security: energy, water, food security and other threats; migration caused by unfavorable living condition due to climate change.
Morality and ethics	An explicit and urgent moral, religious, or ethical call (1) for action i.e. strong mitigation, and protection of the most vulnerable, (2) against action and discussion of scientific uncertainty.
Opportunity	Climate change offers opportunities: (1) as a way to re-imagine how we live and how we should act for further ongoing development, (2) there will be beneficial impacts. No intervention is needed.
Economics	How should the economy handle the costs of climate change? Economics implies either: (1) taking action now: detailed discussion on potential economic actions, or (2) action is hugely expensive or too costly in context of other priorities.
Health	Climate change leads to consequences for human health: for example there are increasing risks of malnutrition due to loss in crop quality; increasing heat weaves will endanger health of city populations. Urgent action is required.

The *Center for Research on Environmental Decisions (CRED)* distinguishes in its 2009 guidelines the promotion vs. prevention frames in climate change communication (CRED, 2009): often people act to change a situation or to prevent it from changing. Some people want to maximize gains. Others want to maintain the status quo to prevent, decrease or minimize losses. If messages are targeted to these preferences for prevention or promotion, the response to the climate change messages will increase.

CRED guidelines offer examples of useful wording for promotional or preventative action in the climate change context. Typical words and phrases for the promotion frame are for example: avoid missed opportunities, hope, promote, support, nurture. Words for the prevention frame are for example: defend, safety, security, protect.

Examples of messages with different wordings:

Promotion frame

> "New data gives hope for meeting the Paris climate targets. Global carbon pollution appears to be close to peaking."
> — Nuccitelli, 2017.

Prevention frame

> "We must reach peak carbon emissions by 2020", says former UN climate chief. "Three years to prevent a climate disaster."
> — Torkington, 2017.

Table 2 includes promotion and prevention-oriented frames. Promotion-oriented frames are scientific consensus, moral and ethics (part 1), opportunity (part 1). Prevention-oriented frames are disaster, security, health, economics (part 1).

1.2. How to communicate through the media

The media play a powerful role in reaching both the public and policymakers. In fact, the public learns about science and new technologies through the media rather than through academic publishing. Given the duty of scientists to communicate to the public, the importance of being aware of how the media work, what journalists may expect from scientists, and what scientists may expect from journalists is underscored.
It is often said that scientists and journalists are like oil and water – two liquids that are hard to mix. This may be partly true; however, there is at least one quality they share: they both have curious and inquisitive minds. Awareness of this trait may help scientists when speaking to reporters.

- Dialoguing with the media is often hectic and ambiguous. Scientists and journalists have different objectives and approaches with regard to what they define as 'a new finding': reporters tend to fall in love at first sight or move forward to the next theme if love does not sparkle. Scientists, on the other hand, tend to carefully qualify their views and findings.

- Reporters always address their readers' interests and concerns. They are focused on the application of a scientific achievement: what this means to people, to the economy, to security. Scientists are often focused on method, detail, consistency of data and peer acceptance of their research.

- Reporters, even the more dedicated and experienced, seek emotion and drama. First, they need to speak to the heart and only afterward to the brain. Scientists tend to be rational and objective: they speak to the brain, bypassing the heart.

- Reporters look for heroes. Scientists need to credit a team and institutions. Be prepared to be the main person and your co-workers to be left in your shadow when you are interviewed by mass media.

- Reporters aim for a breakthrough. Scientists prefer stressing their contribution as part of incremental scientific progress.

- Reporters seek out controversy, conflict, whereas scientists speak about 'scientific debate'. Be prepared to see emphasis placed on the controversial aspects of your research.

- Reporters ask for immediate, clear, crisp comments. Scientists prefer to consult peers, study documents and provide a qualified academic response. Refusing to comment has the likely consequence that the journalist will find somebody else to comment on the topic – and this other expert could be in a competing research group.

Addressing a reporter's needs often improves the quality of reporting. Dialoguing with a journalist means finding a compromise between scientists' and journalists' mutual expectations. At times, scientists may need to take a step back and bring the journalist back onto a commonly agreed track.

When should a scientist get in touch with the media? Typically, scientists contact journalists the moment they have an important finding, soon to be published or presented at a conference. At this stage scientists should:

- Alert their organization's media officer beforehand. Ask for suggestions about how to proceed, and as a precaution write a press release to be distributed to the media.

- Highlight the organization's contribution.

- Keep in mind the criteria for a good story; try to anticipate what journalists may be interested in when made aware of your research.

- Think visually: powerful visuals may play a substantial role in how much space the story will get either on TV or in an article.

- Press releases are distributed via mailing lists from your institution's media officers, or via dedicated internet-based platforms. Although journalists search for stories by scanning these press releases, many of them prefer to receive a call from a scientist pitching a story idea, even if it is self-promoting. Building up a list of preferred media contacts is a tool that may prove useful during a scientist's career.

1.3. The role of science-media interfaces

Should scientists leave communication with the media to, e.g., media offices and others to translate their research results into the formats intended to reach the media and the public? Such interfaces can be very successful in guaranteeing translation of scientific research results into information for the media.

Examples of science-media interfaces

www.sciencemediacenter.org

Science Media Center is an independent press office, makes scientific evidence and expertise available to the public.

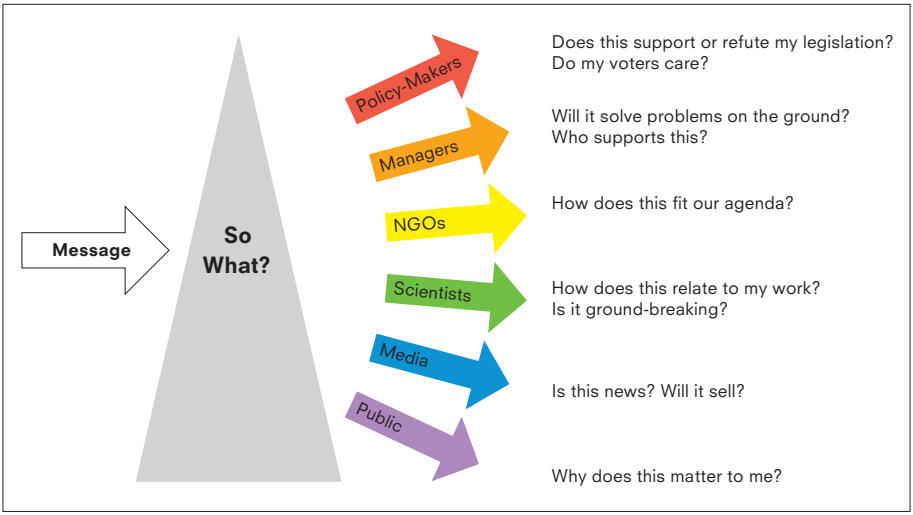
www.pflanzenforschung.de

Pflanzenforschung.de conveys the importance and fascination of plant research to an interested public. The platform is addressed to the interested public and students, but also to scientists from other disciplines, as well as journalists. A special focus is devoted to young scientists.

1.4. Understand your audiences

To successfully connect with an audience, whether through a written essay, a public presentation or a science event, it is vital that you know about the audience beforehand. What is their cultural background, their level of education, their knowledge about the topic? What are their values and interests and what do they expect to learn from your activity? The better you understand your audience, the more likely it is that you can address them properly and keep them interested.

FIGURE 3 — The so-what prism. Adapted from Baron, 2010.



The so-what prism (Baron, 2010) is a helpful model for understanding audiences: The message that you want to transfer to a certain audience will be 'filtered' by the prism of the respective audience – they want to know why they should be interested in what you are telling them. By customizing your presentation to the particular audience, you will make sure that your message passes this prism at 'the right angle'.
Compare, for example, these two websites in their style and tone. They both explain genetic engineering:

- http://agbiosafety.unl.edu/basic_genetics.shtml
- http://tiki.oneworld.org/genetics/home.html

EXERCISE 1
Define media channels

- First think for yourself. Where do you get information about scientific findings? Which media channels do you use regularly?
- Then do a short search by examining various media products for scientific findings and select two samples: local/national/international newspapers, magazines, radio or TV programs, blogs or other social media.
- Ask yourself about the quality of the product: Is the science behind the story explained clearly and correctly? Are original sources referenced? Are the conclusions intelligible and convincing?

This exercise may also help you to get an idea which channels you could use for your own communication efforts.

EXERCISE 2
Enter the world of journalists

Not all journalists are the same. Journalists working for daily newspapers, weekly publications, feature writers and TV news reporters all have different ways of operating. What scientists tend to forget is that only a few journalists have a scientific background. The shorter their deadline, the less time they have for inquiry. Asking about the deadline is one of the first questions a scientist should pose to a journalist before starting an interview. Journalists working on science issues often have limited space to tell complex stories. Furthermore, the material they will report is in most cases partly familiar and partly unfamiliar to them.
Pretend to be a journalist. Ask another scientist from a field you are not so familiar with to explain her/his study, and why it is relevant to society. Now try to write a 250 word story which is compelling, relevant to a non-specialist reader, thorough in its content and, at the same time, easily readable.
After talking to the scientist, you will have three hours to finish a first edit of your story, because the editors will be pushing to have it online before the competition.

For tips from top science reporters and editors, look at:
www.aaas.org/page/tips-science-journalists

1.4.1. The inverted pyramid

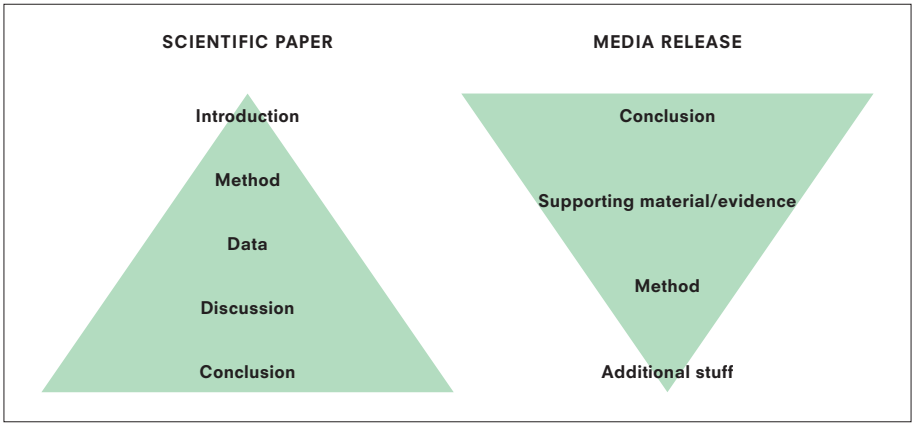
The method and format of science reporting in the media differs from that of a scientific paper. In the media this is called 'the inverted pyramid format'. In a media report, whether in print, radio or television, a summary of the most important findings and the conclusion is placed at the top. Supporting information and key quotes follow. Details of data collection and processing (so relevant to scientists) may be almost totally irrelevant to journalists. This inversion of relevance has two reasons:

- Readers are interested in the implications or applications of a finding rather than how that result was achieved.

- The limited space in the media: journalists need to make their points clearly and straightforwardly in just a few lines (or seconds if on the radio or television). Editors are often in a hurry and in a last-minute cut they may simply cut the bottom of the pyramid without even reading. Important messages at the base of the pyramid may be sacrificed without asking: the reporter will probably find out about the cut only when the news is printed or aired.

In conclusion, when speaking to reporters or writing a media article, it helps to reverse messages: move conclusions up and reduce method and data, which will be moved down. Focus on actual or possible applications of results. Applying the 'message box' tool (described in 'Chapter 2. Tools') to compose the first paragraph can help you here.

FIGURE 4 — Science paper *versus* media release.



1.5. Science communication through social media

Social media are formats whose defining characteristics build on dialogue and conversation in an interactive community. Social media services facilitate the development of social networks online through creating and connecting user profiles. Classical media formats – press, radio, TV – face competition or are even being swept aside by new formats such as blogs and other social media formats such as Twitter, Facebook and LinkedIn. Nowadays many newspapers are available on websites that offer their content via apps, as well as on paper.

1.5.1. Why should scientists use social media?

Several studies show connections between public communication, increased visibility of research, and frequency of citations (e.g., Thelwall et al., 2013; Liang et al., 2014). Scientists who engage in public communication tend to be more academically productive (Jensen et al., 2008). For social media, other arguments and advantages are: communication through social media makes science more accessible and transparent and helps to reach out to other audiences, networking with peers and stakeholders is improved. The collective effort of individual scientists communicating through social media gives science a voice (Kuehne and Olden, 2015). Anecdotal evidence from a study by You (2014) shows that regular writing on Twitter benefits science by:

- Extending other public outreach efforts.
- Learning quickly about new findings and crowd-sourcing new ideas.
- Attracting funding.
- Archiving one's own ideas.
- Getting fast feedback on ideas through peers and the public.

Social media are characterized by different levels of (a) self-disclosure and self-presentation, (b) social presence (Kaplan and Haenlein, 2010). For example, a high level of self-disclosure and self-presentation but a low level of social presence, will characterize a blog. A high level of self-disclosure, as well as high levels of social presence, characterize social networking sites like Twitter and Facebook.

Examples of social media formats used in the science-policy dialogue

Blogs

Blogs can fill a gap for topics that do not address mainstream interests and would not be covered by journalists. Blogs and other social media formats often host personalized stories: in these stories individual experience is shared to transport knowledge and facts and give action-focused messages.

A popular example is the **RealClimate blog** www.realclimate.org. This is a commentary blog on climatology for the interested public and journalists.

Useful Science www.usefulscience.org. This blog provides information on a broad range of topics, from diminishing ADHD symptoms to exercizing more effectively and even optimizing noise levels for greater creativity.

Agrarpolitik agrarpolitik-blog.com. This is a blog on agricultural policies. The authors comment current events and developments on the basis of economic theories, scientific principles, or personal experience and opinions.

Twitter

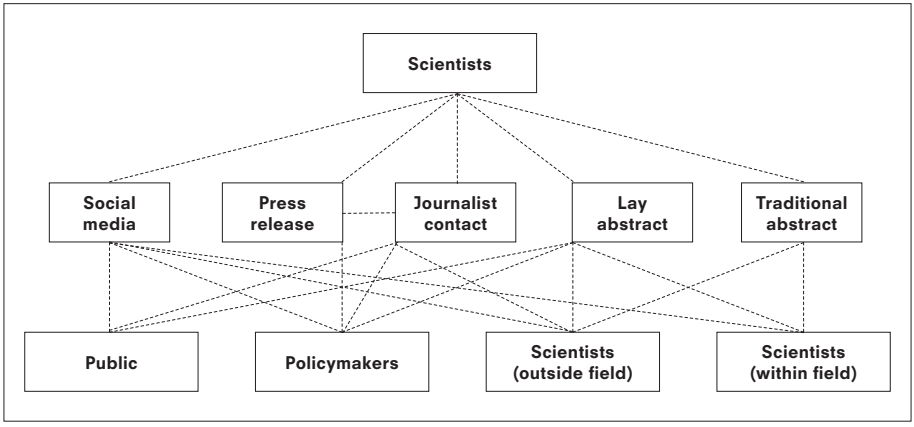
Twitter is a social networking site that allows users to broadcast short posts (tweets) and to follow/share other posts. You (2014) compiled a list of the 50 most followed scientists on the social media platform Twitter. These three names topped the list:

- Neil de Grasse Tyson, Astrophysicist,@neiltyson, Hayden Planetarium, United States.
- Brian Cox, Physicist, @ProfBrianCox, University of Manchester, United Kingdom.
- Richard Dawkins, Biologist, @RichardDawkins, University of Oxford, United Kingdom.

1.5.2. The role of scientists in social media communication

With social media and digitalization gaining importance, public opinion is becoming more fragmented: traditional journalism and journalists are losing their role as the gatekeepers between science and the public (Secko, 2009). With social media, scientists can bypass traditional media and individual users, of whatever standing can participate in public debate (Brossard, 2012).

FIGURE 5 — Pathways for communicating research between scientists and end users.
Adapted from Kuehne and Olden, 2015.



Are social media formats more inclusive and participative? Do social media formats equally represent the diversity of opinions, as well as the richness of scientific evidence in public debate? Do all social groups have equal access to the diversity of scientific information and opinions? Do representatives of different social groups gain different information and opinions through social media? Can all social groups contribute through social media to public debate?
Research on the accessibility of biotechnology information through the social media seems to indicate that, because of the higher motivation to access information, for well-educated audiences learning (in terms of factual knowledge) increases with the amount and hetero-

geneity of information available (Brossard and Nisbet, 2007). For less-educated audiences some research seems to indicate that they also gain easier access to heterogeneous web information. In a US survey, people with poor education background increased their knowledge about nanotechnology significantly the more time they spent on the internet to acquire information; whereas traditional media seemed to rather confuse or even decrease their knowledge levels (Corley and Scheufele, 2010).
Brossard (2012) compared how social and traditional media influence attitudes toward technologies. Contextual information provided by other users (e.g., blog comments) can positively or negatively influence attitudes toward technologies independently of or even in contradiction to the content and opinion originally presented in the article.

EXAMPLE 3
Social media and climate change communication frames

A recent study has shown (Painter et al., 2017) that classical media more often operate with the disaster frame (see table 2, page 15) in their communications about climate change, emphasizing the catastrophic consequences of such change.
In contrast, new digital media players, for example, *Huffington Post* www.huffingtonpost.com, *Vice* www.vice.com and *Buzzfeed* www.buzzfeed.com focus on other frames: *Huffington Post* focuses on the economic opportunity for taking action against climate change through investment in renewable energy or in general building a green economy. Climate justice, i.e., discussion of historic responsibilities with regard to climate change and fair burdens for different countries in the future, is a main topic in *Vice*. Painter et al. concluded that new digital media players provide a:

> […] richness of formats and thematic diversity, which might otherwise not exist […] they give room to societal voices, which are underrepresented in legacy media; they make room for alternative viewpoints, which often do not come to the forefront, and they allow for informal and entertaining modes of discourse which are scarce in legacy media. — Painter et al., 2016: ix.

1.5.3. Misinterpretations

With the decreasing importance of journalists as gatekeepers to knowledge, new concerns are arising regarding accuracy and the need for verification of information and identity.

> The main risk of using social media for news gathering is accuracy. As for news distribution, you lose control over your information with each layer of transmission, as people condense, distort, interpret and comment on variations of the original report.
>
> — Roberto Coloma, Bureau Chief, Agence France Presse (AFP) Singapore in: Alejandro, 2010: 25.

The lay public looks for messages that engage them. Readers search for responses to very simple questions: How can I solve my problem? How does it affect me? In return, social media articles offer simple advice based on 'as recent studies have shown'. Sometimes this advice is misleading and the link to the scientific evidence is missing or questionable.

How can misinterpretation or misinformation using scientific results be avoided? Jackson et al. (2016) suggest that:

- The gap between scientific publications with rigorous data and publications that are accessible to the public needs to be closed for example through open access journals.
- However, even if accessibility of scientific data is improved, the results and their interpretation often remain hidden behind a discipline-specific jargon that needs to be translated.
- Scientists should accept responsibility to publicly correct misinterpretations of their own and others' data.
- Translation of scientific results for the public has to follow yardsticks: (1) **accurate information:** rigorous in scientific method, robust in data, analysis and interpretation; (2) **accountable authorship:** scientists must authenticate themselves as experts and follow responsibility standards for both publishing and republishing in the new media; and (3) **salience:** authors should explain for what problems and needs of the readers the results are useful and provide guidance for the sake of the social robustness of science.
- There are ways to increase accuracy, accountability and salience. Science community-driven sites can curate the contribution of individual scientists, including editorial processes. Science journalists and scientists can increase their collaboration to enhance the accuracy and practical relevance of their material.

EXAMPLE 4
Distortion of scientific information

A prominent example is the misinformed campaign against vaccination, which has resulted in major outbreaks of measles since 2014 in many countries (CDC, 2016, 2017). After near extinction, measles is on its way to becoming endemic in the U.S. and Europe again. Misinformation about vaccination arose from a 1998 paper published in *The Lancet* by Andrew Wakefield, claiming that the MMR vaccine was linked to autism. This paper was a fraud and was retracted, but has been translated into messages by many social media and is still being distributed (Rao and Anrade, 2011).

1.6. The importance of plain language

Plain language will increase understanding of scientific results by the general public but also by a technical readership, thereby increasing the transparency of scientific processes, as well as public perception. Especially when writing for social media plain language is key to connecting with users. Some plain language techniques to interact with lay persons are (CDC, 2012):

- Quickly engage the reader. Give the most important message first. Tell what actions are necessary and why they are important. Enable the reader to do these actions. Use action words that promote specific behaviors. Use concrete nouns (that you can hear, see, smell, taste or touch). Write in the active voice: the subject is doing the action. The following example rewrites the opening paragraph from Rahmstorf and Levermann's (2017) blog post on *Why global emissions must peak by 2020*:

  > In the landmark *Paris Climate Agreement*, the world's nations have committed to 'holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels'. This goal is deemed necessary to avoid incalculable risks to humanity, and it is feasible – but realistically only

if global emissions peak by the year 2020 at the latest.
— Rahmstorf and Levermann, 2017.

Good example: In the *Paris Climate Agreement* the world's nations agreed to restrict the global average temperature increase to 1.5°C above pre-industrial levels to avoid severe harm to humanity. This goal is realistic if we can reduce global emissions to peak by 2020 at the latest.

- Limit scientific language and define technical terms. If technical language is necessary, define the terms in everyday words.

  Good example: global CO_2 emissions.
  Weak example: global CO_2 budget.

- Be accurate and give evidence from your research but without too many details. Use numbers and detailed statistics only when they are necessary to understand your key message. In social media use numbers instead of spelling them out. Explain mathematical terms.

  Good example: We need to restrict temperature increase to 1.5°C above pre-industrial levels to avoid severe harm to humanity.

- Keep sentences and paragraphs short. Use words with one or two syllables if possible.

- Write in a friendly but professional tone. Use personal pronouns.

- Enable action through positive messages. Answer the audience's question: What is in it for me?

- Respect your audience. Encourage your readers to take a particular action or to learn more. Explain the next step.

  Good example: CO_2 emissions can be reduced if all of us try. Learn about steps to cut down individual emissions. One step could be not to take your car. Take the bike instead, whenever possible.

2. TOOLS for communicating science through the media

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2.1. Distilling your story

Purpose
We know so much about our own research that we mostly struggle to simplify and shorten when we write about it. With this tool you will shorten your story to its very essence. We find it hard to look at our own knowledge from someone else's perspective and to see how it fits into the big picture. The message box (Baron, 2010) is a simple tool to help you structure and prioritize your information and focus on the few key messages that are most interesting to your audience. From there, you can later expand again, depending on your target audience.

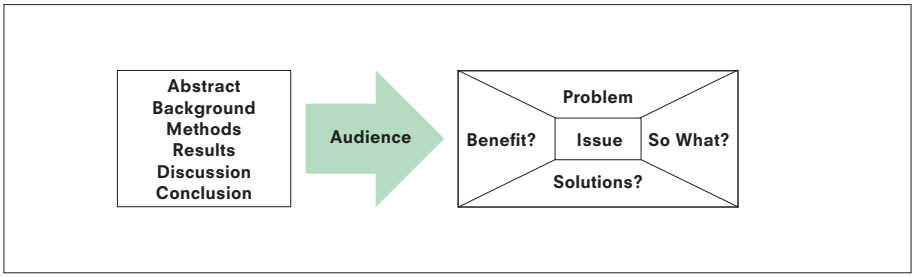
Applications
Once you have distilled your research topic to its key messages, you will have them handy for presentation at any given opportunity. Expanding a story is always easier than distilling it.

Time needed
10–30 minutes.

Implementation
The message box in figure 6 is composed of a central issue connected to four quadrants, each containing a question (Baron, 2010: 108).

- **Issue:** What is the overarching issue or topic?
- **Problem:** What is the specific problem or piece of the issue I am addressing?
- **So what?** Why does this matter to this audience?
- **Solutions:** What are the potential solutions to the problem?
- **Benefits:** What are the potential benefits of resolving this problem?

FIGURE 6 — The message box. Adapted from Baron, 2010.



As you answer each question in the message box, try to put your work into a broader perspective and to frame your arguments. Reflect on what is the societal context or debate that it fits into. You can start with any component of the message box and work your way through all the fields. With the quadrant layout as a mental picture, you can return to your main points no matter where you begin during a conversation / presentation / interview.
Take your own research project and complete the message box. Fill each quadrant with just one or two sentences. You have now succeeded in distilling your message its essence.

Limitation
The success of your message box depends very much on how you frame the issue. Make a reality check with your neighbor or someone without a scientific background to see whether your key messages are understood and resonate with them. To expand from these core ideas, you will need to work on formulations adapted to the specific audience, on inclusion of metaphors and stories to make your expression/presentation effective.

SOURCE — adapted from

Baron, N. (2010). Escape from the ivory tower: a guide to making your science matter. Island Press.

2.2. Writing a press release

Purpose
The goal of the press release is to alert the media about a relevant study and urge them to publish a news article or feature story. In a plenary discussion look at strengths and weaknesses of the press releases: Will they catch the interest of a hectic journalist? Are the core messages presented clearly? Is scientific jargon replaced by everyday words? Students try to look at their own research from a different perspective like somebody who does not know about the research itself, but has to distill the messages relevant to the public. A better understanding of the media process will help scientists to communicate more efficiently and effectively with media officers and journalists.

Time needed
15–20 minutes.

Implementation
Students are asked to produce a press release with the following structure:

TITLE
Use a short title in active voice without scientific details or phrases.

FIRST PARAGRAPH
This paragraph is composed by 3-4 sentences including: Who are the authors? What were the main findings? In what journal and what date where the findings published? Why are they relevant?

SUBSEQUENT PARAGRAPH(S)
The rest of the press release should contextualize and provide additional information about the finding. Why is it exciting or unexpected?

CONTACT INFORMATION
Give the contact of the corresponding author (name, email, phone number, institution). How can the paper be accessed (URL, DOI).

EMBARGO INFORMATION
Note the date and time that the embargo (if any) will be lifted.

Special focus needs to be put on the first paragraph, which must contain the famous **5 Ws** of journalistic writing:

- **Who** did the research?
- **What** is new?
- **Where** is it published?
- **When** does it get published?
- **Why** does it matter?

When completed, the press release must look like a neat and professional document with contact names, a precise structure, an attention-grabbing title, a few quotes, links to original papers and studies and links to downloadable material such as pictures and videos.

Read some press releases to get an idea about what they look like. A possible source is www.eurekalert.com.

Limitation
The support of your organization's media officers is an imperative. If you, as a scientist, believe you have a potentially relevant media story, contact them first to avoid conflict.

SOURCE — adapted from

www.asbmb.org/Outreach/Resources/HowTo/PressRelease/

2.3. Giving an interview

Purpose
Once you have decided to speak up about your research and a press release is sent out, there is a good chance that a journalist will contact you. So you should better be prepared. Preparation can be a 'mock' interview in class or even with a colleague. Once you have experienced a mock interview, you are also better prepared for a real one.

Time needed
15–20 minutes for the interview. 10 minutes for plenary discussion.

Implementation
Preparing for the interview. The following are tips for a real interview with a journalist. Consider them when preparing and conducting the 'mock' interview in class.

- **Find out about their context**. Who are they? What is the publication and its readership? What's the deadline? Who have they spoken to or want to speak to? Scientists are also allowed to ask questions.
- **Call back.** Ask for five minutes to gather your thoughts, a few relevant data/figures, then call back.
- **Strive for clarity.** Check with the interviewer if he/she has really understood the background and scope of the research. Try to open up the perspective on potential future development and applications, as journalists appreciate future outlooks. If the research has economic, political, social, environmental or technological applications, it is worth mentioning them to the journalist.
- **Negotiate the interview.** Set terms at the beginning of the interview. Ask the journalist to show you your own quotes before publication. You cannot control the full story, but your own quotes belong to you and you need to make sure they correctly express your views.
- **'No comment'.** It sounds bad. If scientists do not feel sure about a particular theme, they should simply say that they cannot speak about that area and pass the journalist on to another person if appropriate.
- **Give clear messages.** Scientists should speak in layman's terms. Translate technical jargon into something digestible by the people on the street. Make sure that the journalists have understood this, do not take for granted that they fully understand the science.
- **Think about storytelling.** Journalists will appreciate any story/anecdote/metaphor connected to the research to embed in their report. People love reading and listening to stories. For millennia this has been the main way to convey messages, distribute knowledge. Humans are still hooked on good stories.

- **Interviewing for TV.** Look at the camera or at the journalist (not at your feet). Don't wave your hands around. Reiterate your message many times so that it will be picked for the sound bite. If possible, do not wear glasses or lined shirts. Give short, clear statements.

The trainer or an invited journalist interviews each participant for 10 minutes. As in a real situation, the participants do not know what to expect during the interview. Afterward, the trainer will give quick feedback (5–10 minutes): Was the participant clear in her messages? Did he/she provide the broad picture, the implications of her research for the potential readers of the interview rather than for academia? On the other hand, did the journalist try to lead him/her in unexpected or sensitive directions? Did the journalist push for some answers beyond what the scientist felt comfortable to give or explain? Depending on the number of participants, the whole class can give feedback.
Best results are achieved through alacrity, openness and dialogue. Do everything to make your message interesting and intelligible and to make the transfer to TV, radio or print as easy as possible. This is probably the best way scientists can influence political agenda through the media.

Limitation
If the trainer has no background in journalism, this may cause a slight limitation. We recommend you to invite a journalist for this exercise.
What are the limitations of a real interview? Whatever the final report shown online or aired on the radio will be, you should be aware that full control over your message is not possible.

MORE READING

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2.4. Elevator pitch

Purpose
Participants should practice for the shortest speech possible, lasting only as long as a casual meeting in an elevator with somebody who might change the course of a scientist's career or of a political decision, for example, a potential funder or policymaker/politician. How will the scientist persuade this casual listener about the relevance of his or her research? This is a standard exercise, where speakers practice being extremely brief and as clear and convincing as possible.

Time needed
15 minutes for explanation and preparation. 1 minute for the speech. 10 minutes for plenary discussion.

Implementation
As an ideal scenario, participants simulate a chance encounter in an elevator with a potential funder of their research, or a policymaker. In a 1-minute-long speech they have to persuade their companion of the importance of the research or project they are working on. If the listener could not be persuaded, she or he will walk away. As a simulation, after one minute the doors open, the listener cheers (or walks away, if not convinced) and leaves.

The audience gives feedback on:

- Style and organization of delivery
- Confidence and articulation of the exposition
- Persuasion and clarity of content

Do not hype. Hyping is a short-leg strategy, it may even boomerang back on you. A good strategy is to have the scheme for such a short speech available in your brain. **Prepare for yourself these answers:** I am [who], I belong [to this group], and my project deals with [this subject], which is important [for industry? For society at large? For a particular social category such as the elderly?]. We can make a change [by doing this research, developing this method]. You should aim to close the encounter by handing over a business card or getting contact details.

Limitation
Limited audience and time to communicate information; preparing a good pitch is time-consuming. This technique is used more often to find sponsors than to communicate with society.

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