

## ACCESSIBLE ORAL PRESENTATIONS

*Most of the time at conferences is spent listening to others talk. Given the overwhelming challenge for the audience to sit through, absorb, and remember material from all these presentations, a speaker must be memorable to connect with the audience. As the previous chapters focused on scientific writing, this chapter starts by distinguishing written communication from oral communication. Oral communication requires a new set of skills to speak most effectively with the audience, organize presentations, and deliver presentations professionally and with style, the topics of the rest of this chapter.*

Science in the early nineteenth century used to be the rock shows of today. People would pay to see the latest scientific, and pseudoscientific, presentations. Standing-room crowds of hundreds would cheer wildly for the presenter. Lectures were often accompanied by wonderful new machinery, explosions, and astounding physical experiments to entertain the audience, who were held in rapt attention by speakers with powerful speaking voices, physical energy, and personal rapport.

Think of the last scientific lecture you have attended. How similar was it to this spectacle? Can you even remember what the speaker's principal conclusions were? What has happened to us over the last 200 years?

### **24.1 HOW WRITING DIFFERS FROM SPEAKING AND WHAT THAT MEANS FOR YOUR PRESENTATION**

A successful scientific presentation has many of the same characteristics as a successful scientific manuscript. Just as the science in an article should be worthy of publication, a speaker should be presenting material worth listening to. Like the author of an article, a speaker should also determine who the

*Disappoint your listeners at your peril. They might not throw tomatoes or rotten eggs, but they might dismiss you, might be unwilling to find out how good a researcher you really are—just because you put on a bad show. —Peter J. Feibelman (1993 p. 28)*

*I try to provoke my audience, mostly by going out on limbs that I would never do in writing a professional paper. This makes them more alert and stimulates people to ask questions, and so I make it a point to leave plenty of time at the end, even while sacrificing material that I might also like to have presented. —Kerry Emanuel, Massachusetts Institute of Technology*

audience is and how best to reach them. Finally, similar to the purpose of a manuscript, the purpose of a talk should clearly frame its content. Despite these similarities, however, the differences are crucial to understanding how we create and deliver effective presentations:

- ▶ **Presentations must be focused.** Generally, writing requires the author to elaborate on details and provide all the evidence supporting the conclusions. Speaking requires keeping the audience focused, which usually entails limiting the number and depth of details in the presentation.
- ▶ **Presentations have more flexibility.** Articles have fixed layouts and delivery methods (print or online). In contrast, presentations are more flexible, with more ways to emphasize material, either through the speaker's delivery or multimedia content. And, including color figures does not cost extra.
- ▶ **Presentations are received by a captive audience.** Articles are read by the audience at their convenience and at their own pace, sometimes again and again until the results are finally understood. Presentations are delivered to a mostly captive audience in a room at a fixed time and place. The audience members are beholden to the pace of the speaker, and they get a one-time viewing.
- ▶ **Presentations involve feedback between the audience and the speaker.** Who reads your journal article is largely unknown, so the author has to write for an unspecified audience who cannot ask questions or provide feedback to improve the article. In contrast, the audience faces the speaker, and their feedback can be received in real time—facial expressions, approving nods, questions, notetaking, yawns, reading e-mail, talking on the phone, and booing—all are indications of the level of audience participation.
- ▶ **Presentations can be provocative.** Whereas scientific journal articles are peer reviewed and permanent, speaking is not. Presenters can be more informal, provocative, and controversial.
- ▶ **Presentations can contain fresh content.** Once published, the content in the article is fixed. Unlike writing where the content is months or years old, the content of a talk can be only minutes old. Presentations can be updated for variety, spontaneity, different audiences, or different occasions.

For these reasons, presentations are not spoken summaries of a paper! Effective speakers know how to take advantage of the above differences to create a focused, flexible, attention-commanding, interactive, provocative, and fresh presentation. Before you jump in and start composing your PowerPoint presentation, consider the following seven admonitions in this chapter, which, when ignored, plague many poor presentations.

## 24.2 FOCUS YOUR MESSAGE

Speakers need pithy presentations because time, especially for conference presentations, is quite limited. If focusing your message and concision were important lessons in Part I on writing, they become essential for presentations.

Consider the following. Reading a journal article can take several hours. Reading that same article aloud to a seminar audience would take much longer. Thus, scientific presentations by necessity cannot have the same level of detail and complexity as the scientific articles upon which they are based.

Because you cannot go as deep into material in a talk as you can in a manuscript, keeping the audience focused will require you to eliminate details that might be essential for duplicating your results, but otherwise would be a distraction to most of the audience. Such an approach may sound dishonest, but the audience can ask specific questions about the approach in the question-and-answer session, talk to you afterward, refer to the extended abstract, or wait for the published manuscript.

Most speakers overestimate the importance of their material to the audience, thinking that they can condense their manuscript into a ten-minute talk. Many manuscripts make several points, and not all those points can be adequately justified to the audience in an oral presentation. What one or two things do you want your audience to remember? A rule of thumb from Charles Doswell is that five minutes are generally required to deliver one point of substance. If you are giving a 10-minute conference presentation, that is two points, maximum. Having decided on these key points, build the talk around them.

Avoid trying to present too much content, which either ends up rushing the presentation or forcing you to speak too long. Scrutinize the necessity of

*I maintain the focus of the audience on my talk by my visualization techniques, by varying my voice, by moving around, by using hand gestures, by inserting one-liners (which actually are devices used to gauge attention, as well as entertainment), and by involving the audience (making them give me feedback, asking them to guess, to vote on alternatives I give them).  
—Robert Fovell, University of California Los Angeles*

### LEARNING A LESSON—THE HARD WAY

I was once asked to give a talk about snow to a local ski club. I took my hour-long scientific presentation on snow microphysics and reworked it for a nonscientific audience. The result was a Titanic disaster, and when I realized I was sinking, all I could do was rearrange the deck chairs. By the time my talk was over, the audience had mentally checked out early and had become amused by this nerdy scientist talking over their heads.

Why did I fail? I failed to consider the audience, a group of nonspecialists who did not want to know about the details of the Bergeron–Findeisen effect (surprising, I know). I failed to focus my message—“The vertical profile of the atmosphere determines the type of snow that falls and how good the skiing will be.” I failed to build a new talk from scratch around this point, only employing graphics from my prior scientific talk in hand. And, importantly, I failed to add some levity to the talk, given that this was a club that liked to have fun.

every slide. Does it add to the content of the talk, or are you keeping it because you cannot bear to remove such a nice-looking slide?

### **24.3 KNOW WHY YOU ARE GIVING THE TALK**

As with writing a manuscript, having a clear definition for the goals of your talk *before* composing the talk is essential. Why are you giving this talk? Why were you selected and not someone else? Was it invited? What is the topic? Are you trying to persuade forecasters to adopt your methods? Or, were you looking for your laboratory to pay for your trip to this Hawaiian conference?

What is the reason for the talk? You may want to inform, persuade, confront, inspire, educate, or some combination of these. Different types of talks require different approaches. Whatever the purpose, speak to the occasion. If the occasion is to honor a venerated scientist, make sure you say something about how the honoree inspired you. If you were invited to train forecasters, make sure you give them usable information to be better forecasters. When strong action is required to shake up or inspire an organization, Prof. Cliff Mass of the University of Washington, a master of such presentations, advocates, “Never go ad hominem or personal.” Instead, he argues that a stronger, more insistent, and serious tone is needed than with a traditional scientific presentation.

For meetings, find out more about your position in the schedule. If you have been invited to give a presentation and are opening the session, your remarks can be more introductory and forward-looking, with a tip of the hat to the people that follow you. If you are the last speaker in a series, try wrapping up the comments and building connections among the various speakers that preceded you. You may even wish to contact the other speakers before the meeting to ensure that everyone’s messages are complementary rather than redundant.

*Are the slides for you or the audience?” —Terri Sjodin, youtube.com*

### **24.4 ADDRESS YOUR AUDIENCE**

Ask yourself, “What does this audience want from me? And, why is it important?” Then, figure out how to connect with them. Respect your audience. Do not show contempt or disregard for them by not understanding their needs. They took the time listen to you, so make sure their time was well spent. Remember that you are trying to impress them.

As with papers, your audience will determine your presentation style and content. If you are presenting to an audience of nonspecialists, you need to alter the standard scientific presentation you would give to your colleagues or peers. What background information do you need to present? What jargon do you need to define or eliminate?

Do not overshoot or undershoot your audience. At the NOAA/National Severe Storms Laboratory, we would have the occasional visit from an administrator from NOAA headquarters who would tell us about all the great NOAA initiatives that were going on, often things that we already knew were happening because they were *our* projects. In another situation, we had a speaker come to the lab and give a presentation about climate change, talking to us as if we were high-school students. If you do not know your audience, do your best to find out from the conference organizer or the sponsor of your visit before you arrive.

If you suspect that the audience might have a strong negative reaction to your presentation, avoid biasing them against your material too early in the talk. Present noncontroversial material early, then systematically reveal the discrepancies with the current thinking until they have no choice but to agree with your overwhelming evidence.

#### **24.5 DELIVER THE CONTENT AT THE RIGHT BAUD RATE**

The human brain has a high capacity to process information. Unfortunately, to connect the speaker's brain to the brains of the audience members requires communication through a narrow channel that delivers information both verbally and visually. The baud rate of this information channel needs to be carefully managed. If the speaker transmits more information than the narrow information channel can accept, the audience will not receive the information. On the other hand, a speaker with a small baud rate underutilizes the information channel, and the audience members' brains idle and start to daydream.

Planning an effective talk must take into account the volume and rate of information that the channel can support, which will be a function of the education level of the audience, the level of material being presented, the content and quality of the presentation and presenter, how fast the presenter speaks and displays information, and how distracted the audience is. Furthermore, your audience will be applying filters related to their own backgrounds, experiences, and values. Some of your messages may be understood quite clearly, others may not be. Incorporating that knowledge into the design of your presentations will ensure more reliability in transmitting information.

#### **24.6 CREATE A SYNERGY BETWEEN YOUR WORDS AND YOUR VISUALS**

The mind processes information through all the senses. For presentations, these are generally verbal and visual. To take maximum advantage of the brain's processing capability, the speech and slides need to complement each other rather than contradict each other or be redundant. The brain cannot

*It is far better to be understood by your audience—even if you convey less information than you hoped—than to convey everything you intended and be incomprehensible.*  
—Stephen Benka (2008)

process information when it arrives both written and verbally at the same time, resulting in the following failures:

- ▶ Slides with too much text spread the audience's attention between reading and listening, so that they do neither well.
- ▶ If the text is read verbatim off the slide, then the speaker is redundant because the audience can read the slides faster than they can be said aloud.
- ▶ Having few connections (or even inconsistencies) between the speaker's words and the material on the slides confuses the audience, reducing comprehension.

Thus, the spoken word and the visual cues on the slides must be synchronized. The best approach is to favor relevant photos and graphics over text on the slides, do not read the slides verbatim, and speak articulately about the material on the slide.

## 24.7 UNDERSTAND THE DISTRACTIONS TO YOUR AUDIENCE

Your goals as a speaker are to connect with the audience, hold their attention on your topic, and help them remember it. How effectively you can do that is determined by the presentation quality, the presenter quality, and the audience quality. You can imagine that the best presentation given by the most energetic lecturer would still fail to connect if the audience were distracted, uninterested, or asleep. Although some of the factors that lessen the audience's ability to pay attention may be out of your control, others are entirely within your control (Table 24.1).

As you speak, watch your audience. Get a sense of everyone in the room, not just a few individuals. Some people will fall asleep no matter what, so do not judge your performance too harshly based on them. Does your audience seem attentive? Do they look confused? As the speaker, you must take control.

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**Table 24.1** Factors that lessen an audience member's ability to pay attention

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Boring speaker  
Topic not of interest  
Before coffee break or meal  
After a meal  
Late in the afternoon  
Laptop, e-mail, or cell phone  
Illness  
Personal issues and distractions

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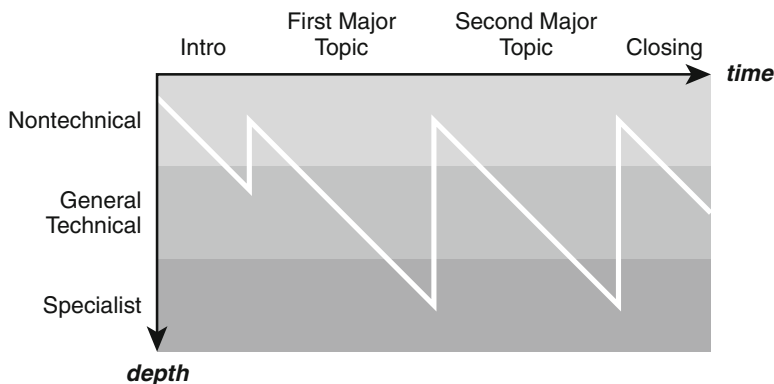
Back up and reiterate your point using a different approach. Ask a question of the audience to wake them up, to get them to actively participate in your presentation, and to get feedback on how well your message is being received.

## 24.8 ADDRESS EVERYONE WITHIN A DIVERSE AUDIENCE

Most speakers must balance two competing effects. While oral presentations require a focused message, most audiences usually have a diverse background. The speaker must therefore balance a lot of detail (narrow, but deep) with a wide perspective of the research (broad, but shallow). This lack of consideration of the depth and breadth of the presentation plagues many conference presenters who focus, for example, on describing intricacies of the data collection methods or the simulations. Unfortunately, these details may appeal to only a few people in the audience, while the majority of the audience is bored, left unappreciating the potentially interesting reasons for the study or the implications to the larger research community.

Communicating with your audience in these situations will require you to broaden your material, to make it more interesting to more people. Do not worry about speaking too long at a general level for the specialists. Most people probably would rather spend their time in a well-presented but general talk than a poorly presented but specific talk.

Broadening is not your only possible strategy when speaking to a heterogeneous audience. Speak to their diversity throughout the talk (Fig. 24.1). Start out by discussing the topic in a way that everyone can understand. As the talk progresses, dive down to depths at various points, reaching more specialized portions of the audience. At the end of a topic and especially at the end of the talk, come back out to the big picture. Connect what was just learned back to the whole audience, so even nontechnical audience members know the implications of what just happened, even if they did not understand the specifics. Repeat this cycle for as many times as you need to.



**Fig. 24.1** Timeline showing the presenter reaching multiple audiences by beginning at the surface of a topic for nontechnical audience members, diving into a subject for the specialists, and then surfacing to gather the entire audience again. (Caption and figure adapted from Fig. 2-3 in Alley 2003.)

The vertical axis of Fig. 24.1 could also represent different disciplines. For example, in a talk about the societal impacts of flash flooding, you may be speaking to an audience of meteorologists, hydrologists, and social scientists. As your presentation follows the curve of Fig. 24.1, touch upon topics that relate most closely to the meteorologists, then the hydrologists, then the social scientists. Such a cycle does not need to be repeated or be in a specific order, but by making at least some portions of your talk relevant to each segment of your audience, you can deliver a talk that your whole audience will appreciate.