

Scientific Presentations Are Like Chocolate

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Overview

Many scientists would prefer to remain in the lab, running experiments and producing new data in our field. At some point we will each have to step outside our comfort zone and present those results to a larger audience. Why suffer through the presentation when we can shine? Each speaking opportunity gives us a chance to show our enthusiasm for our research, to develop networking opportunities, even to impress the chair of a faculty search committee sitting in the audience!

When we see someone give an outstanding presentation we often assume they are a “natural” speaker and that we could never be that good. Wrong! Speakers don’t emerge fully formed - they improve by conscious practice and directed improvement. Each of us has the ability to present with confidence at lab meetings, departmental seminars, and research conferences. Today we will discuss and practice some of the concepts that go into delivering a good presentation. Good presentations are like chocolate, highly desirable (even tasty!) when carefully crafted and packaged.

Suppose you work in research and development for a chocolate manufacturer. Your task is to design a new chocolate candy for the company. To do this successfully, you must first determine what type of chocolate the consumer desires. You then make the chocolate candy, optimizing the mix of ingredients for taste and the layering of the ingredients for substance. You then package the chocolate attractively, adding a bit of sparkle to get attention and make it appear professional and polished. Your chocolate is now ready for market!

Scientific presentations are a lot like chocolate. You must first assess your audience to determine the needs of your “customers”-the audience! How much do they know about your topic, and what is their level of technical sophistication? You then select your core question or hypothesis, which is the center of the chocolate, and surround it with a logical flow of data and clearly defined sub-questions. Now you need something to contain that hypothesis and supporting data - an organized and well-delivered presentation. This is the hard candy shell on your chocolate. Finally, you must design attractive visual aids and respond well to questions - the pleasing wrapper on your chocolate that will entice the customer to “buy in” to your product...your results and conclusions. By working through each step in the presentation process, we end with a professional “chocolate” product ready for the market.

Telling (True) Stories

As scientists we're taught to stick to the facts, rather than to tell stories. However, facts on their own are just that – facts. Collections of information, that on their own don't come together into a larger whole, one that tells us something new about the world. To convey that bigger picture, the importance of these facts, the new ideas or conclusions we can draw from these facts, we need to tell a story.

Stories are particularly important if we're giving a scientific talk to a lay audience. People respond to stories - just look at the success of Hollywood blockbusters or the latest book on the best seller list. Scientist-turned-filmmaker Randy Olson talks about scientific (and Hollywood) storytelling in his book "Don't be *Such* a Scientist", where he reminds us that even science has heroes, villains, and the occasional damsel in distress.

So, what's your story? Here are a few story forms that work well with scientific talks.

- Problem/solution: Convince your audience that there's a problem, then take them through data that points to a solution. This is a common form for seminars.
- Assumption/solution¹: A revision of problem/solution, you first simply assume that there is a problem, freeing up more time to work through the solution. This form is useful for specialist conferences (everyone at a cardiac conference knows that heart attacks kill), or for controversial topics (like climate change) where you want to move past the controversy and brainstorm solutions.
- Recaps and previews²: Brief recap of what is already known (or data you've shown before), followed by a preview of where your research is going. This is a good format for lab meetings or regular seminars where you frequently speak to the same group.
- Two-by-four from the left³: Lead your audience down a familiar path (such as an accepted hypothesis or model), then "hit" them with new data that leads things in a new direction.
- Hero/villain: Create a villain-could be a person, a disease, a problem in the field that has vexed people for years, and show how the "hero" (you, someone else, a new drug) conquers the villain. This is a great format for public talks to a lay audience.
- Character development/conflict: Is there a big conflict in your field, with groups of scientists advocating specific positions? Set up the conflict (and tell your audience about the characters), then show new data that helps settle the conflict, or steers it in a new direction. Warning: don't use names if the "characters" are in the room, unless you are very senior or you know them well enough to gauge their reactions!

¹Modified from Dr. Jennifer Schneider, Colorado School of Mines

²Based on Dr. Andy Bechtel, University of North Carolina at Chapel Hill

³Julia Parrish, University of Washington

PowerPoint Tips

How often have you heard a session chair announce, “Speakers, please load your presentation before the next session.” This statement implies that your slides *are* your presentation. In this case, you might as well just hand out a copy of your slides and everyone can go home early. In scientific presentations, PowerPoint software is a great tool to show your data, complete with time-lapse movies and sound files. But remember, you are in control of your electronic files. To quote professional speaker Ruby Newell-Legner, “PowerPoint is valuable as a tool to enhance - not replace - presentations. People don’t come to hear you speak because of a multimedia slide show; they come to hear what you have to say.” The most important thing to remember is that you control the visual aids - don’t let them control you.

Entire books have been written on the subject of designing slides, so covering it all is well beyond the scope of this handout! Here are just a few do’s and don’ts for using PowerPoint and other presentation software.

Do

- Favor images and figures over text
- Build up complicated slides, but without fancy animations
- Allow 1-2 minutes to explain each slide
- Use clearly contrasting colors
- Use figures and images that best represent your data
- Keep figures simple
- Clearly explain figure axes
- Make slide titles descriptive
- Turn off sleep mode and screen savers
- Use at least 24 point Sans Serif font with no effects (e.g., shadow)
- Lead in to each slide before putting it on the screen
- Pause before discussing each slide
- Use a “finisher” slide

Don’t

- Face your slides instead of your audience
- Remove a slide before your audience has a chance to read it
- Overuse the laser pointer (or point it in someone’s eyes!)
- Overwhelm your audience with multimedia gadgets
- Put too much information on a slide
- Present complicated data tables
- Put material on a slide that you will not discuss during your presentation

*Sources: “Using multimedia without losing yourself” by Ruby Newell-Legner, “The do’s and don’ts of using visual aids” by Arthur F. Grand, Ph.D., both from The Toastmaster magazine, Toastmasters International; Anholt 2006, Morgan and Whitener 2006 (see reference list).

Evaluation Guide

Use these questions to help prepare for your next presentation and to help your colleagues during practice talks.

Preparation

Was the big picture apparent?

Was the main hypothesis or question clear?

Did the speech have a strong opening?

Was the level and amount of background information appropriate for the audience?

Was the data logically organized?

Was each sub-question or hypothesis clear?

Were these questions clearly answered?

Was the conclusion strong and effective?

Delivery

How well did the speaker control nervousness?

Did the speaker make eye contact with the audience?

Was the speaker's voice audible?

Did the speaker vary his/her voice to fit the topic?

Did the speaker's body language add impact to the speech?

Slides

Were slides clearly organized?

Was the appropriate content on each slide?

Was there minimal text?

Did the speaker discuss all data shown?

Were all words and images large enough to see clearly?

General

What are the speaker's two greatest strengths?

What two areas could use the most improvement?

Presentation Checklist

In the Beginning

- Performed audience analysis
- Presentation has a clear central question or hypothesis
- All data are relevant to this hypothesis
- Opening statement grabs audience attention
- Data is presented as a cohesive story
- Conclusions are clear and vivid
- Visual aids enhance the presentation

Practice, practice, practice

- Comfortable with the material
- Notes are prepared, legible, and useful
- Presentation is within allotted time
- Date, time, and location of presentation are confirmed
- Visual aids are used smoothly
- Speaking voice is natural and audible
- Body language is natural

The Big Day

- Clothing is tucked in, zipped, and appropriate for the occasion
- Laser pointer has batteries
- Presentation is loaded on computer hard drive
- Presentation is archived on CD-ROM or flash drive
- Back-up computer and projector are available
- Screen saver and sleep mode are off
- Notes are typed and handy (if needed)
- Cell phone is off

You're ready-good luck!

Resources

Scientific Communication Resources

- Anholt, RR (2006) Dazzle 'em with Style: The Art of Oral Scientific Presentation, 2nd Ed. Elsevier Academic Press. *Personal favorite!
- Baron, N (2010) Escape from the Ivory Tower: Your Guide to Making Your Science Matter. Island Press.
- Chambers, HE (2001) Effective Communication Skills for Scientific and Technical Professionals. Perseus Publishing.
- Dean, C (2009) Am I Making Myself Clear? A Scientist's Guide to Talking to the Public. Harvard University Press.
- Kenny, P (1998) A Handbook of Public Speaking for Scientists & Engineers. Institute of Physics Publishing.
- Morgan, S and B Whitener (2006) Speaking About Science: A Manual for Creating Clear Presentations. Cambridge University Press. *Great for visual aid help
- Olson, R (2009) Don't be *Such* a Scientist: Talking Substance in an Age of Style. Island Press.

General Public Speaking Resources

- Carpenter, RH (1999) Choosing Powerful Words: Eloquence that Works. Allyn and Bacon, Needham Heights, MA.
- Filson, B (1994) Executive Speeches: Tips on How to Write and Deliver Speeches from 51 CEOs. John Wiley & Sons, Inc. New York, NY.
- Frank, MO (1986) How to Get Your Point Across in 30 Seconds or Less. Pocket Books, New York, NY.
- Gilman, AD and KE Berg (1995) Get to the Point: How to Say What You Mean and Get What You Want. Kendall/Hunt Publishing, Dubuque, IA.
- Wilder, C and J Rotondo (2002) Point, Click & Wow! A Quick Guide to Brilliant Laptop Presentations. Jossey-Bass Pfeiffer, San Francisco, CA.

Allyn and Bacon Public Speaking Website: [www.abacon.com/pubspeak/Kirby Tepper](http://www.abacon.com/pubspeak/Kirby_Tepper)
American Public Speaking Training: www.powerpublicspeaking.com/

Toastmasters Information

Toastmasters International: www.toastmasters.org
Toastmasters Chamber Club 540 (Romio's Pizza, Greenwood and 85th, Tues. 7-9 PM)
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