Career Seminars for Fellows

"Public Speaking in Science"

Dana-Farber Cancer Institute

September 5, 2007

The following packet contains handouts and tipsheets on public speaking and creating oral presentations:

1. Tips on Delivery: the Use of Voice and Body in Public Speaking
2. Organizing Your Science Presentation: a General Outline
3. Preparing Notes for Speaking
4. Article: "Why Are So Many Scientific Talks So Dull? Do They Have To Be that Way?"
5. Effective Use of Visual Aids and PowerPoint
6. Effective Use of Graphs and Tables
7. Helpful Websites for Public Speaking in General and Oral Presentation in the Sciences

Rebekah Maggor, Director
Program in Speaking and Learning
Derek Bok Center , Harvard University

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Delivery: Use of Voice and Body
Engaging your Audience

Tip #1 – Connect with your Audience.

Public speaking is a dialogue or exchange between speaker and audience. Even if the audience remains mostly silent—such as during a lecture or formal presentation—it is still an exchange. Think of it like playing catch with a ball—the speaker pitches an idea or concept; the audience catches it and throws back signals in response such as nodding, taking a note, raising a hand with a question, or even looking confused or inattentive. There are three steps to throwing a ball—just as there are three crucial steps to communicating with an audience during a speech, presentation, or interview.

1. Are you ready? (make eye contact with your audience—prepare them for each pitch throughout your talk)
2. Throw the ball (pitch your idea/concept to your audience).
3. Did you get it? (Did your idea "land"? Did the audience catch it?)

- Public speaking is not about *you* it's about communicating your idea or message to your *audience*.
- Make genuine eye contact around the room all through the presentation to make sure your audience "catches" what you "throw" out.
- *Be in the room*. React to what is going on around you. Concentration is about *taking things in*, not about shutting things out.

Tip #2 – ***Breathe*!**

- Take a deep breath before you begin your presentation and make eye contact with several people in the audience. (Are they ready?)
- **Breathe** low and deep between sentences throughout your presentation or talk. If you tend to get nervous, speak too fast, or mumble—taking regular deep breaths will help you calm down, slow down, and speak clearly and distinctly.

Tip #3 - Connect with your Body.

- Remember: you speak with your entire body—not just your mouth. Stand up straight, **breathe**—energize your presence and "own the room."
- Be conscious of your body language. What signals are you sending through your gestures, stance, and tone of voice? Do you have any distracting habits? ("Signal vs. Noise")
- Do a physical or vocal warm-up or some sort of physical activity before you start your talk—it will help you deal with nerves and focus on the task at hand.
- Let your arms and hands rest in an open and available position—don't clasp them in front or behind you. If you are standing at a podium or sitting at a table let them rest on the podium or on the table. If there is no podium or table let them rest at your sides. Don't worry about planning hand gestures—if you are focused on your audience and your hands are relaxed and available when the urge for a gesture comes they will rise.

Tip #4 – "Speak the Speech"

- Present important or operative words (including terminology, names, and key phrases) clearly and generously. (This is your specialty—don't assume your audience has heard these terms before).
- Vary your pitch, rate, and volume to stress these important words and phrases
- Calibrate the volume of your voice and enunciate clearly enough to reach the people in the back of the room —the audience should be able to hear and understand you ***effortlessly***.
- Keep your vocal energy up throughout the sentence—don't "trail off" at the end of sentences.
- Instead of looking down at your paper *as* the sentence is ending, stay with your audience until the very end of the sentence and "land" your idea.

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Organizing Your Presentation

A General Presentation Outline

This talk outline is a starting point, not a rigid template. Most good speakers average two minutes per slide (not counting title and outline slides), and thus use about eight slides for a fifteen minute presentation. If you need to leave five minutes for questions within the 15 minutes—reduce your presentation to around six slides.

- **Title/author/affiliation** (1 slide)
- **Forecast** (1 slide)
  Give gist of problem attacked and insight found (What is the ***one idea*** you want people to leave with? This is the "abstract" of an oral presentation.)
- **Outline** (1 slide)
  Give talk structure. Some speakers prefer to put this at the bottom of their title slide. (Audiences like predictability.)
- **Background**
  - **Motivation and Problem Statement** (1-2 slides)
    (Why should anyone care? Most researchers overestimate how much the audience knows about the problem they are attacking.)
  - **Related Work** (0-1 slides)
    Cover superficially or omit; refer people to your paper.
  - **Methods** (1 slide)
    Cover quickly in short talks; refer people to your paper.
- **Results** (3-5 slides)
  Present key results and key insights. This is main body of the talk. Its internal structure varies greatly as a function of the researcher's contribution. (Do not superficially cover all results; cover key result well. Do not just present numbers; interpret them to give insights. Do not put up large tables of numbers.)
- **Summary** (1 slide)
- **Future Work** (0-1 slides)
  Optionally give problems this research opens up.
- **Backup Slides** (0-3 slides)
  Optionally have a few slides ready (not counted in your talk total) to answer expected questions. (Likely question areas: ideas glossed over, shortcomings of methods or results, and future work.)

*** **PRACTICE** your presentation aloud with your PowerPoint slides so you can:

- Time your presentation and stay within the allotted time limit.
- Use your visual aids comfortably and effectively
- Make eye contact and engage with your audience
- Leave ample time for questions

Adapted from "Oral Presentation Advice from Mark D. Hill," Professor of Computer Sciences and Electrical and Computer Engineering, University of Wisconsin—Madison
http://pages.cs.wisc.edu/~markhill/conference-talk.html

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SUGGESTIONS FOR PREPARING SPEAKING NOTES

While several of these reminders might strike you as obvious, speakers often ignore them when preparing to speak.

- Use an outline format for your notes:
  An outline helps you visually recall the structure of your talk. Placing numerals and letters by the various points in your talk also helps you distinguish main points from subordinate ones. If you indent supporting points, the outline will be easier to read while you are speaking.

- Keep the outline as brief as possible:
  Too much detail on your notes encourages you to read them to your audience. When this happens, you can't maintain eye contact with your listeners and you lose any sense of engagement with your audience. (Remember the three steps in the ball-throwing exercise: 1-Are you ready? 2-Throw the ball. 3-Did you get it? Stay engaged with your audience as you throw out your ideas.)

- Place visual cues on the outline if necessary:
  A good speaking outline includes the content of the talk as well as reminders about how you wish to proceed. You might mark certain sections of notes where you wish to pause, or to speak more slowly or loudly to achieve emphasis. You might remind yourself about when to use a visual aid. Perhaps you want to pause at particular spot to ask the audience for questions.

- Make your speaking notes legible:
  Under the stress of speaking before a group, you may suddenly be unable to decipher your own writing. You'll need to be able to read your notes at a distance -- they need to be clear and large enough for you to do so easily.

- Practice speaking with the notes you have prepared:
  That's the only way to tell for sure if your notes will make sense to you at the time you'll be giving the final presentation.

Adapted from the Mary Washington College Speaking Intensive Program
http://www.umw.edu/spkc/resources/students/handouts/structure/suggestions.htm

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Program in Speaking and Learning
Derek Bok Center , Harvard University

Why Are So Many Scientific Talks So Dull? Do They Have To Be that Way?
by D. Eric Walters, Ph.D.

When you attend a conference or a seminar, what is the probability that very good science will be presented in a very dull way? Unfortunately, this happens too often.

Why are so many scientific talks so dull? There are several reasons. First, science has a very strong written tradition. You are expected to write your results in such a way that others can reproduce them. You are expected to give sufficient data to support your conclusions. If you over interpret your results, others will discover this and your reputation will suffer. Data and detail are highly valued; hype is not. Therefore, scientists tend to be cautious and monotone in presenting their results, and they are thorough in showing the data. This can lead to extremely unexciting presentations, with overly complicated graphs, tables and diagrams.

There is another reason. Most of us do not get much formal instruction in oral presentation in the course of our scientific training. It simply is not considered as important as doing the science and writing the papers. Only later do we discover that our speaking skills can have a tremendous influence on the course of our careers.

Do they have to be that way? No, of course not. We can all improve our presentation skills. First, we must realize that oral presentations serve a role much different from our written work. Papers and books are the place to present all of the experimental procedures, details, and data. The oral presentation is the place to *tell the story* of your research. The story describes the circumstances and thought processes that led you to do the work, highlights the frustrations you and your colleagues experienced along the way, and conveys your elation when you succeeded. Most important, an oral presentation is your chance to share with others why you find your topic interesting. Be sure to share your enthusiasm with your audience. This helps the listeners to connect with what you are saying.

The oral presentation is *not* the place to tell everything you know about your subject. It is a good idea to decide in advance what will be the key message you want listeners to recall long after the talk is over. If you can state that key message in a single clear sentence, you will have a foundation on which to organize your talk. Your presentation will have a clear focus.

There are other ways to improve as well. Visual aids (slides, overheads, PowerPoint presentations, and others) are usually better if they contain a few key words in a large font than if they become a script which you read to the audience. They can read faster than you can speak. If you put the whole story on the screen, they will read rather than listen. On the other hand, if you just give them a few key words, they will *know* just enough about what you are talking about to desire to *listen* to what you have to say about it.

Practice and experience are helpful as well. Look for opportunities to speak, and enlist colleagues to give you constructive feedback about your presentations. Rehearse often if you have to give an important presentation, so that you will stay within the time limit and will feel comfortable with your talk.

# # #

Eric Walters is Professor of Biochemistry and Molecular Biology at The Chicago Medical School (www.finchcms.edu/biochem/walters.html). He and his wife Gale, a food scientist, are the authors of *Scientists Must Speak: Bringing Presentations to Life*. He has been a member of The Science Advisory Board since January 1998.

http://www.scienceboard.net/community/perspectives.46.html

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Suggestions for Using PowerPoint and Other Visual Aids

Possible visual aids include:

- The presenter: personal appearance, body language, gestures, voice, facial expressions;
- Maps;
- Graphs (Pie, Line, or Bar);
- Charts (Flow, Tree, Stream, Sequence, Pictograph, or Flip);
- Photographs and Pictures;
- Posters;
- Objects or Models;
- Overhead Projections, Slides, or PowerPoint;
- Handouts;
- Films, Videotapes, or Audio Tapes.

Planning your Visual Aids

1. Plan your talk first, **then** decide what visual aids you will need.
2. The visual aids are there to illustrate or emphasize what you say—they are **not** the main event.
3. Present **one** topic per visual aid.
4. Structuring your PowerPoint Slides:
   - ***Use a minimal amount of text, in a large clear font.***
     - Resist the temptation to use fancy/cool fonts!
     - Sans Serif fonts such as Helvetica or Ariel project most clearly
     - Use at least a 20 point font.
   - Font color should contrast sharply with background (yellow on very dark blue, black on white)
   - Be consistent with the background and avoid backgrounds that are difficult to read from.
   - Proof your slides for spelling, repeated words and grammatical mistakes. (If English is not your native language have a friend check your presentation).
5. Keep figures as simple as possible.

For each visual aid you have planned, ask these questions:

a. Why is it there?
b. What does it show?
c. Does it show this clearly, even for people in the back row?
d. Does it support the main point or key message?
e. Is there anything there which doesn't need to be there?
f. When will it be shown? When will it be removed?

Using your visual aid successfully:

- *Practice* to make sure visual aids are well-integrated into the speech.
- Plan placement of visual aids prior to the speech.
- Check to see that the electronics are running, and that you know how to operate them.
- Do not display the visual until the relevant moment. When finished remove it, or cover it.
- Do not stand directly in front of the visual, stand to the side and face the audience.
- When referring to the visual aid, point, don't leave your audience searching.
- Do not distribute materials during your speech. If you have prepared handouts, distribute them before or after you speak

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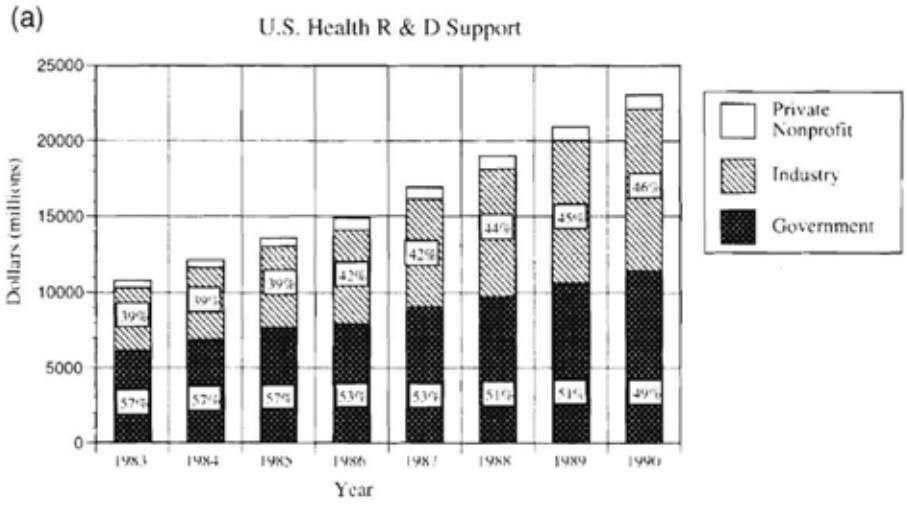
Suggestions for Using Graphs and Drawings in Your Presentation

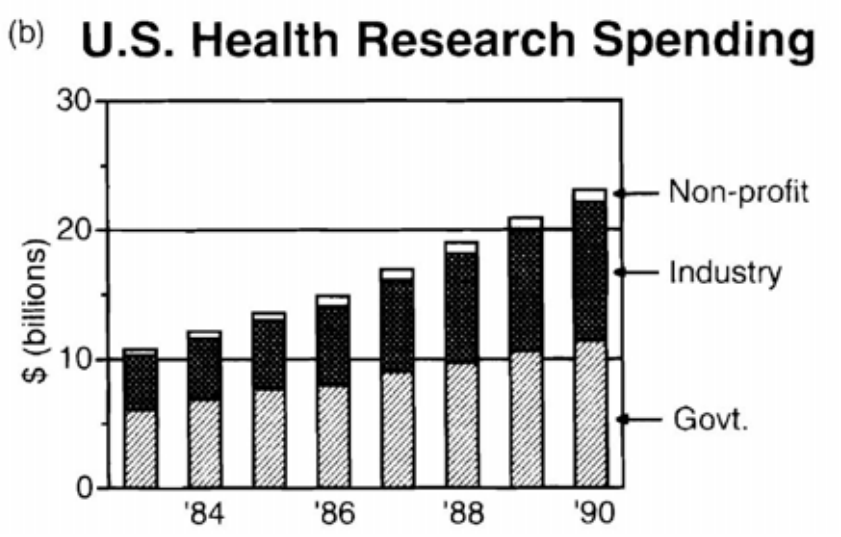
- The reason for using a graph or drawing is to *illustrate* or *clarify* something.
- Very simple, schematic drawings work well—the fewer lines the better.
- Details included on the printed page or computer screen are often too much for the visual aid
- Details important to publication may be safely omitted from the visual aid

Conveying the "big picture"



In print this graph is readable, but when it is projected onto a screen there are

- too many lines
- the numbers are too small.



This is a simplified version of the above graph

- the lines are bolder
- the legend is replaced with much larger labels.

Adapted from *Scientists Must Speak* by D. Eric Walters and Gale Climenson Walters

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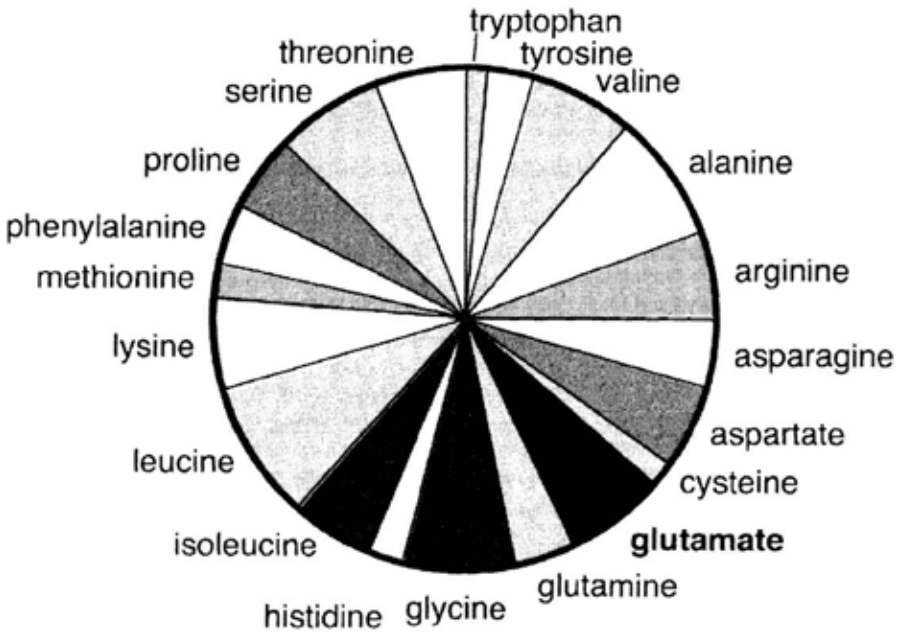
Tables versus Charts

- The below table gives us the numbers, but it takes a fair amount of time to look at the numerical data and understand what is going on.

Table 3.1 Amino acid frequency in a protein database

Amino acid	*Percentage*	*Amino acid*	*Percentage*
Alanine	8.3	Leucine	9.0
Arginine	5.7	Lysine	5.7
Asparagine	4.4	Methionine	2.4
Aspartate	5.3	Phenylalanine	3.9
Cysteine	1.7	Proline	5.1
Glutamate	6.2	Serine	6.9
Glutamine	4.0	Threonine	5.8
Glycine	7.2	Tryptophan	1.3
Histidine	2.3	Tyrosine	3.2
Isoleucine	5.2	Valine	6.6

- Graphs let you convert this numerical data into pictorial forms which can have more immediate impact.
- Pie charts, such as the one here, can quickly convey percentages or fractions of a whole subject.



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Helpful Websites

PUBLIC SPEAKING ANXIETY

- University of Wisconsin Counseling Center, Self-Help Resources
"Public Speaking Anxiety"
http://www.uwstout.edu/counsel/selfhelp/speechanxiety.html

- University of Tennessee-Martin, Counseling and Career Services
"Public Speaking Anxiety"
By Louise Katz, Ph.D.,
http://www.utm.edu/staff/ccenter/counseling/publicspeakinganxiety.html

PRACTICING PUBLIC SPEAKING

- Toastmasters International
Join a Toastmasters club in your city to practice and improve your public speaking.
http://www.toastmasters.org/about.asp

ORAL PRESENTATIONS IN THE SCIENCES

- "Effective Presentations"
An On-Line Tutorial Series through the University of Kansas Medical School
http://www.kumc.edu/SAH/OTEd/jradel/effective.html

- "How *Not* to Give a Scientific Talk"
By Michael De Robertis, Professor of Astronomy at York University
http://www.casca.ca/ecass/issues/2002-js/features/dirobertis/talk.html

- "Oral Presentation:"
Advice from Mark D. Hill, Professor of Computer Sciences and
Electrical and Computer Engineering at the University of Wisconsin-Madison.
http://pages.cs.wisc.edu/~markhill/conference-talk.html

- "Dazzle 'em with Style"
Writing and Speaking about Physics and Astronomy, Ohio State University
http://www.physics.ohio-state.edu/~wilkins/writing/Supp/dazzle.html

- Also see the Writing and Speaking Homepage, Ohio State University:
http://www.physics.ohio-state.edu/~wilkins/writing/index.html

GENERAL PUBLIC SPEAKING SKILLS

- "Designing Effective Oral Presentations"
The Rice University On-line Writing Lab
http://www.ruf.rice.edu/~riceowl/oral_presentations.htm

- "Improve your Communication Skills"
MindTools.com
http://www.mindtools.com/page8.html