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Communicating Research Results Tips for Preparing and Making Oral Presentations

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It's useful to think of an oral presentation as a cross between a written report and a newspaper article. An oral presentation should give the most important information first, leaving the details for last (in case the audience is asleep by then). This format is called an "inverted (or upside down) pyramid." A presentation should tell a story, keeping in mind the journalist's check-list - "Who? What? When? Where? and Why?"

Who is your audience?

The only measure of a good presentation is the reaction of the audience. Will they manage to stay awake during your presentation? Two days later, will they remember anything you said? Will they be convinced? Find out as much as you can about your audience, think carefully about their needs and preferences, and tailor your presentation to them as precisely as you can. Are they already interested in your topic? This determines what and how much you have to say to introduce your research. What do they already know about your topic and what is their general level of scientific/technical expertise? What are their attitudes/preconceptions about your topic: will they go along with whatever you say, or will you have to convince them to change their minds? What sources do they listen to: do you quote an article from *Nature* or from the *New York Times*? What state are they likely to be in: are you the last speaker on a long day's program? Do they understand English easily?

What do you want to say?

Two rules apply: (1) Your audience determines what you say and how you say it, and (2) You shouldn't say very much. Imagine you're meeting a typical member of your audience who happens to be an old friend. You sit down over lunch to tell her about your research. An outline might look something like this:

1. My research in a nutshell. Why I did it, what I did, and what I found out... all in about six sentences.
2. Why this research? What was the problem? Why was it important? What other work has been done? If another researcher or two has done important work on your problem or your methodology, you should acknowledge them.
3. Here's what I found out.
4. And here's why it's important. Want a quick trick to detect whether you've dropped out of story-telling mode? Look for sentences in the passive voice: "The sequence of amino acids 1-7 was obtained from a partial cDNA clone." Remember: a presentation is talking, not writing. No one talks like this.

How do you prepare?

There are three key ingredients for making a good presentation: preparation, preparation, preparation.

For starters, you must know your material thoroughly, which means knowing a lot more than you actually present. Think of your presentation as the tip of an iceberg: the submerged part of the iceberg, which is the much larger part, as everything you leave out. The better you know your material, the more relaxed and confident you will feel in front of a group.

Many good speakers write their notes on 4x6" index cards. Put one line of your outline at the top of each card, and then jot down everything you want to say in that section of your talk. If you're having trouble thinking of a good beginning, start in the middle or the end, perhaps by telling about your methods or conclusions.

Now try speaking one or two sections out loud. How long did it take? For the Symposium, you will have 10 or 15 minutes to present your **research**. Here's a hint: a 15-minute presentation is equivalent to about six typed pages doubled spaced; a 10-minute presentation is equivalent to about four pages. Not very much, is it? Just the tip of the iceberg.

This is not to suggest that you should type your presentation out word for word. Rather, you should write it as notes, or cues, on those index cards, just to remind yourself of the points you want to talk about.

After practicing out loud, cross out what you didn't have time for. Leave your cards overnight and then go through them again. You'll probably think of new and better ways to get your points across, a more logical sequence for your ideas, even important points you forgot. Make a new set of cards (buy a big package, you'll probably go through a lot of sets).

Try your speech out on a teacher or friend. You're so close to your subject that you might go on and on (boring!) or leave something important out (confusing!) that another person can easily spot. Be prepared to cut, cut, cut.

Preparing your audiovisuals

You will want a maximum of one overhead per minute of your talk. For a 15-minute presentation of experimental research, your overheads might be as follows: (1) title/author, (2-3) key points (equivalent to an abstract; putting the most important information first); (4-5) background and importance of problem (introduction), (6-9) what you did (methods and materials), (10-13) what you found out (results) and (14-15) importance of your findings (discussion).

To give your presentation a polished, professional look, you should prepare all your overheads in the same style: same type fonts, same spacing, same use of color. Text should be at least 28 points in size (one-half cm high). Titles should be larger. Follow the 6 x 6 rule: a maximum of six lines per overhead and six words per line. Think in terms of a title followed by a bulleted list. Use short, active phrases only, not complete sentences -the complete story is what you say, the overhead is just for emphasis.

Each chart should make one simple point. You may use line charts for continuous data (such as time-series), but bar charts are more dramatic. Even scatter charts can tell a dramatic story: Are all points on a curve except for two outliers? Are the points all over the chart with no pattern at all? Use a maximum of four lines per line chart (three is better), six bars per bar chart (four is better). Keep labels to the minimum necessary, and keep all your charts in two dimensions (no cute, but misleading, perspective effects).

Charts are better than tables; but, if you must use a table, the 6 x 6 rule applies. A maximum of six columns and six rows. This includes the column and row with labels, so you have five columns and five rows for data.

Now you're up there

You will feel a lot more relaxed and confident in front of your audience if you figure out the logistics of your presentation before hand. Arrive early and check the podium where you will be standing (Where should you put your speaker cards?). Check the facilities for showing your overheads (Will someone else help you? Try to practice ahead of time. Where will your overheads be stacked before they are presented...and afterwards?)

(Hint: you may need to go back to an overhead during the question period so don't just drop them in a heap when they come off the projector.) Check the microphone. (Hint: Be sure to wear clothes with a lapel or patch pocket in case the auditorium has clip-on microphones.)

When you come up to the podium to begin your speech, take your time. Take a few good, deep breaths, look out at the audience, and find some smiling, friendly faces. Look into their eyes and let their smiles encourage you. Tell them about your project as you would to a friend over lunch.

Then they ask questions

After your presentation, the audience will have 5 or 10 minutes to ask questions. This may be the most important part of your presentation, and you should prepare for the question-and-answer period just as thoroughly as you prepare for your talk.

Have some extra points ready to bring up at this time-some of the material you cut from your speech, such as problems you encountered and how you solved them, or additional items you didn't have time to mention. You may even bring up further implications from your work and ideas as to what you would like to do next. To present additional **results**, have one or two extra overheads ready to show.

Above all, take your time (remember to breathe!) and don't let the questions fluster you. If someone asks a question straight from outer space, buy yourself some time while you think of a response: "That's a very interesting question. As I understand it, you are asking... [restate their question in your own words]."

Practice making a smooth transition from their question to one of the good answers you have prepared: "I don't know the answer to your question, but a related issue that we encountered was..." or "I'm so glad you asked about the methods we used for handling our cultures because we actually tried a second nutrient system and got some rather interesting **results**. As you can see from this slide, which I didn't have time to show you during my talk..." or "That's a really good question. Perhaps we can come up with an answer in the next stage of our work."

Remember, you're not expected to know all the answers. Don't be afraid to learn something from your audience. Above all, try to convey a sense of excitement about your work. If you can do this, your audience may just surprise you and stay awake.