How to Give a Scientific Talk*

All you ever wanted to know about writing or refereeing papers, and giving talks, but you never dared to ask

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*The slides for this talk are mostly by Olivier Danvy (University of Århus).

Why This Talk?

"I have reached the stage where young mathematicians and physicists sometimes ask me for advice—mainly people who want to work on quantum gravity. Here is my advice. A lot of it applies to grad students and postdocs in any branch of science who seek an academic career involving research. The stuff on giving good talks will be helpful to almost all scientists, since most give pretty bad talks."
[John Baez, "Advice for the Young Scientist"]

The Point

You have to give a talk:

- scientific (seminar, conference, retreat);
- interview (e.g., for a job);
- other (teaching, administrative meeting, lunch / dinner).

In all cases, do it well!

Why Should I Give a Good Talk?

- To do justice to your topic.
- To not waste the brain cycles of your audience.
- People who give good talks often get the good jobs and more recognition.

> "Reputation is our business." (Moshe Vardi)

Before the Talk: What to Say

Assumption: You have a message. What is it? Note: Having a paper to present is not necessarily the same as having a message!

Having identified your message, ask yourself:

- Can I explain it clearly?

- If so, how? What is my punch line? Most importantly:

  What do I want the audience to take home from the talk?

  "It is easier to state what features of a lecture the audience will always remember, and the answer is not pretty." [Gian-Carlo Rota]

My Message in a Nutshell
Four Requirements of a Good Lecture/Talk

1. Every lecture should make only one main point.
   Audience = heard of cows [Gian-Carlo Rota]

2. Never run overtime.
   Fifty minutes = one microcentury [John von Neumann].

3. Relate to your audience.
   Tip: Everyone in the audience has come to listen to your lecture with the secret hope of hearing their work mentioned.

4. Give them something to take home.

(Gian-Carlo Rota. Ten Lessons I Wish I Had Been Taught.)

Roadmap of this Talk

1. Generalities.
2. Specifics for different type of talks.
3. Slides and their (mis)use.
4. What can go wrong during a talk.
5. Handling questions or their lack.
6. Conclusion.

Before the Talk

Try to immerse yourself in what you are going to say (e.g. by giving the talk to yourself).

Right before the talk:

- Do: Be comfortably dressed; breathe deeply.

- Don't: Drink carbonated beverage!

During the Talk

Straighten up.

Face your audience.

Smile. Express that you are happy to be here.

Dare to speak slowly and loudly.

Speak for the others (not for yourself).

Accept that in the end, by giving a talk,
you express who you are.

Conducting the Talk: The Ending

- Announce the ending (e.g., with a slide entitled "Conclusion").
- Summarize the background (and thus the significance of your work).
- Summarize the achievements.
- Open perspectives (future work).
- Thank the audience!

The Timing of your Talk

Challenging slots:

- Right after lunch (especially in France, Italy and Spain).
- The morning after the conference dinner.
- The last session of the conference.

Universal solution:

- Be interested in your topic.
- Have a tonic voice.

Specifics: Giving a Very Short Talk

Setting: Very limited time (less than 10 minutes).

- You must have a very clear message. (Keyword: Elevator statement.)
- You want your audience to take home that message.
- Less is more! Eschew all techicalities.

Specifics: Giving a Conference Talk

Setting: Short and limited time (20–25 minutes).

- You want people to read your paper.
- You want those who have read your paper already to appreciate one specific thing.
- If your paper has several points you can make only one of them. (The anguish of having to choose. . .)

Specifics: Giving a Seminar

Setting: Limited, but longer time (45–60 minutes).

Recommendations:

- Be well-prepared.
- Be very clear about your goals.
- Don't hesitate to defend your positions, but don't look irritated. You are in control!

How to Deliver the Talk

Stream of consciousness with no support whatsoever. (Leave it to actors and opera singers.)

Read from a script. (Do it only for very formal occasions.)

Use a black- or white-board (common in mathematics).

Use slides (the done thing in computer science).

> Mantra: The message is more important than the medium or the messenger.

What's the Point of a Slide?

The slide is not an end in itself.

The equality

Good slides = Good talk

is not always valid. The slide supports and guides your talk.

Try to cooperate with your slides.

A Suggestion: The Comic Strip

Assemble your slides in a hand-drawn comic strip:

- It gives you an overview of your talk (in one or two pages);
- You can't write too much on each slide!

Question: How many slides per minute?

Basic Macroscopic Techniques

Have simple and informative slides.

Have a very clear overall plan.

Use a roadmap (sign posting for the cows).

Except for the plan, avoid forward references.

Writing the Slides

By hand (if your handwriting is readable).

By machine.

Active slides (with a laptop)

- Content: the slides can be adapted up to the very last minute [Good or bad?]

- Form: do not overdo anything.

Standard Mistakes

Small fonts or handwriting.

Invisible colour.

Meaning attached to colours (colour blindness is less uncommon than you think. Watch your Powerpoint backgrounds!).

Long and complete sentences.

Overcrowded slides.

Unreadable slides (abysmal handwriting, bleeding ink, scratches, dust, fingerprints. . .).

Slides written at the last moment.

Handling Your Slides: Basic Techniques

Don't talk while putting on a new slide. (Information overflow.)

Hide as little of the screen as possible (in particular, when pointing at things).

Question: How does one point at things?

Have several plan slides and annotate them in advance. (To keep your audience and you on track.)

Try to Avoid

Correcting slides on the fly.

Making self-comments.

Putting your hand on your mouth while speaking (even if it feels so good).

Hum, ah, er, mmmmmhh, etc.

What Can Go Wrong

Plan:

- Interruptions.
- Running out of slides.
- Running out of time.

Interruptions at a Conference

You can:

- answer on the spot (but don't get carried away);
- say "good point; just wait two slides";
- say "good point; I'll come back to it at the end of the talk.";
- (sledgehammer) use a secret slide.

Minor Interruption

What to do:

- Don't panic!
- Straighten out and carry on.
- Take a simple example and make your point.

You have time.

Major Interruption

What to do depends on the nature of the interruption:

- about your assumptions;
- about your point.

About your Point

E.g., already done by someone else:

- if most of the audience is non-specialist,
  - situate the nature of the interruption, and
  - delay the discussion until after the talk.
- if most of the audience is knowledgeable,
  - make your point clearly, and
  - discuss it out.

Running out of Slides

Not a disaster. Short talks are appreciated!

What to do:

- conclude unhurriedly, and summarize the main point of the talk (don't repeat the talk though);

- say "thank you; are there any questions?" .

Don't make a personal comment ("hum, I am running out of time/slides again!" or some such; it looks bad).

Running out of Time

To be avoided at all costs, but if it happens:

- Do not skip through fifty of your slides looking for the right one to put on next!
- Conclude by making your main point.
- Thank the audience.
- Above all, do not assume that you can carry on as if nothing had happened!

Right After the Talk

Plan:

- Handling questions.
- And if there are no questions?

Example Question I

Question: Wouldn't it have been simpler to do this instead of that?

Answer, version 1: The question is "Wouldn't it have been simpler to do this instead of that?" That's a very good point. No. I tried, and it's actually simpler to do that.

Answer, version 2: The question is "Wouldn't it have been simpler to do this instead of that?" That's a very good point. Perhaps. It's worth a look.

Example Question II

Question: Isn't your main theorem a corollary of Erdös's theorem?

Answer: The question is "Isn't your main theorem a corollary of Erdös's theorem?".
Good question. Which theorem do you have in mind?

Example Question III

Question: Blah blah. Blah blah blah blah blah blah blah. Blah blah. Blah blah blah blah blah blah blah blah blah?

Answer: The question I believe is "Blah blah?" . . . (and then for an appropriate answer). . .

Example Question IV

Question: More than a question, I want to make a comment. Blah blah. Blah blah blah blah blah blah blah.

Answer: Thank you very much.

If There are no Questions

Be patient, but do not wait forever—the sound of scientific silence is embarrassing.

Thank the audience once again, and let people go back to their business.

Talk shop with whoever stays on.

Why Giving a Good Talk?
Conclusion

Your reputation does not only depend on your work, but also on

- what you say,
- how you say it, and
- whom you say it to.

Advice: Cultivate the social side of science. Make yourselves seen and heard, but do not overdo it!

Conclusion

These are just general guidelines: suit them to your needs.

Do what I said, not what I did here:

- plan your talk in a top-down style;
- make only one main point;
- practice your talks carefully;
- never run overtime;
- relate to your audience; and
- give them something to take home.

The advice we give others is the advice that we ourselves need.