Giving Talks

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The idea that the movie people know how to present this stuff [physics], because they are entertainment-wise and the scientists aren't is wrong. They have no experience in explaining ideas, witness all movies, and I do. I am a successful lecturer in physics for popular audiences. The real entertainment gimmick is the excitement, drama and mystery of the *subject matter*. People love to learn something, they are "entertained" enormously by being allowed to understand a little bit of something they never understood before. One must have faith in the subject and in people's interest in it. [...] The faith in the value of the subject matter must be sincere and show through clearly. All gimmicks etc. should be subservient to this. They should help in explaining and describing the subject, and not in entertaining. Entertainment will come as a byproduct.

> *Letter to Mr. Ralph Bown*
> Advisory Board in Connection with Programs on Science, March 7, 1958
> R. P. Feynman

Goals:

1. Present information.
2. Make it worthwhile for the audience (social contract theory of talks).
3. Strive to elicit the exhilarating feeling of dawning comprehension in the minds of your listeners.

Requirements:

1. There is no substitute for having done and being in the position to present great research.

Tips/comments/topics for discussion:

1. Identify the *subject matter*, the primary points you want to make, what you want to teach the audience. What do you want the audience to come away with? Think about Constant Listener. Return to these points at the end of the talk and connect with the argument you've made. At every stage, ask yourself "What is at stake?"

2. Define a clear logical line. What is *necessary and sufficient* to include? Avoid all superfluous details.

3. Introduce a central tension or drama in order to engage the audience. That is, present a problem and then go about explaining how you've solved it, or how you will solve it, or how your work sheds light on a solution. Ask yourself "What is at stake for the field?"

4. Storyboard your talk and/or write an outline. Understand the transition between each slide and how to prepare Constant Listener for that transition. Challenge yourself to outline your entire talk from memory on a sheet of paper ahead of time. Use this knowledge to foreshadow key pieces of your argument in early parts of the talk. Prepare the listener to understand. Make your talk multiply-connected.

5. Understand your work in historical context, as part of the arc or development of a subject. Read the literature and the classic works. Relate it to what you know and have done. This is important for fluency and depth, but also for your listeners to understand the importance of what you have done.

6. Practice fluency. Strive to be able to talk clearly and succinctly about all aspects of your work and all its connections to all other topics.

7. Know and understand everything on your slide. Do not put it on your slide if you're not 100% sure. Study your slides and try to anticipate questions. Telegraph questions with telepathy.

8. Work out examples and analogies for all of your major points. Work out numbers/references and have them in store in case people ask questions. Your talk needs to be deeper than what is on the slides.

9. Avoid putting figures in your talks that are taken directly from (your) papers, unless those figures are pedagogical or are exceptionally simple. If you need to show a complicated plot/diagram, build up to it. Prepare your audience to understand it. Start with basic intuition about how things should "go" as a function of x and y, and then expand by adding more lines.

10. Practice. Put in time to make a good talk. Components of fluency come with practice. Eventually work toward spontaneity, less practice.

11. Ruthlessly avoid saying something that is not necessary (just because you took a lot of time on it). Ask yourself what is *necessary* for Constant Listener to understand. Sprinkle insights and connections throughout (remember Goal 3 above).

12. Identify your tics of speech ("um," "like," "however," "of course," etc.). Do not affect thoughtfulness with these devices.

13. Dealing with questions: hear the question, understand the question, repeat/unpack the question for the audience. Don't jump ahead of the question-asker with anticipation. Think and be seen to think. Then, respond. It is OK to say you don't know, but it should sting if you know that you should know. Do not make stuff up! "Let's talk about that afterward."

14. Adjust in real time. Recognize that you've lost the audience and adjust. Use your empathic response.

15. How to deal with aggressive questioners. Ceding the moral high ground. Condescension.

16. Understand that the way the audience perceives you is not in general the way you perceive yourself. Try out new versions of your presentation self.

17. Some basic stuff: Maximize figure size. Big axes, nice labels, clear text, no blue on red, no yellow lines, well-labeled axes on plots, simple/partial sentences. Look at the audience. Realize when your bit rate is too slow/fast. Realize if you are moving too much or too little. Rough rule of thumb: ≤ 1 slide transition every 1 minute on average. Watch a video of one of your talks. If possible, look at your slides on a projector rather than your laptop screen before giving (projectors vary widely!), be mindful of the physical space (deep vs. wide rooms), clearly articulate, good/high volume throughout sentences. Never say "As we all know."