

How to Give a Really Bad Math Talk

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There are numerous excellent papers, notes, and blog posts on the subject of giving a good math talk, such as [H, K, G, BA]. However, comprehensive advice on giving a bad math talk is much harder to come by. This paper is intended to fill that gap.

Many years of both listening to and delivering quite bad math research talks and really bad undergraduate lectures made me a true expert on the subject. In this note I want to share some of the valuable advice that I accumulated with you, who may possibly have had less experience in giving bad talks than I did.

My advice is centered around the following five key aspects of giving a talk:

- (1) Know your audience!
- (2) Blackboard or slides?
- (3) Delivery of the talk
- (4) How to start and how to finish
- (5) How to deal with questions

If, for any reason, you are actually trying to give a good math talk, you may attempt to apply the same advice in reverse. So let us begin. . . .

1. Know Your Audience!

While preparing the talk, try to find who is normally in the audience, and what they know. This information will help you deliver quite a bad talk. Some things to keep in mind:

- If there is a famous expert in your field present, aim the talk directly at them and make sure your talk is on the right level. You don't need to aim at the PhD students' level. They probably know the basics anyway,

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DOI: <https://doi.org/10.1090/noti3123>

so don't waste your time on explaining any general stuff.

- If the audience is in a slightly different field than your talk, that's a big advantage for you. They will learn a lot in a short amount of time if you go directly into the technicalities of your topic.
- If you are talking in a conference aligned with the topic of the talk, then it goes without saying that you shouldn't explain anything at all. Direct your talk at your friends and collaborators. If there are starting PhD students, or outsiders of the field present in your talk, that's not your problem, that's their problem. Making explicit and definite presuppositions about the audience ("I am sure you all have seen the definition of a catenary ring so I don't need to repeat it") may also discourage unnecessary questions. More about dealing with questions later.

2. Blackboard or Slides?

Whatever the medium is, use it well! There is no doubt that using correct techniques, some of which are described below, you can give quite a bad talk using slides or a blackboard, or even combining the two.

Blackboard talks.

- You need to use a blackboard to your advantage. For example, don't erase too often: find an empty spot in the middle of the board, and write your theorem there.
- An alternative, and sometimes a complementary strategy is to write an important theorem, and then to erase it immediately afterward. Let the audience train their memory! It works especially well if the theorem is long and technical.
- This goes without saying, and is obvious to experts of bad talks: write illegibly. For example, too small works well, or make all your letters look alike in formulas.

Slides talks.

- Even though this may be stating the obvious, let me emphasize this very important point: have as much information as possible on every slide. The talk is about information transfer, so it's your job to pack your presentation with relevant stuff.
- Similarly, have as many slides as you can. An estimate for an optimal speed in a bad talk is 30 seconds per slide, so for 60 minutes talk, you may need to prepare 120 slides.

For further creative ideas on using a blackboard or slides in math talks, see [CL].

3. Delivery of the Talk

So how do you deliver a really bad talk? Here are useful tips that many speakers rely on.

- Try not to dwell too much on important points. This way you are not wasting your or anybody else's time, and you'll let your audience decide what's important for themselves.
- Use technical jargon whenever you can. You can either use well-known (or better, obscure) definitions in the field, or heavily rely on complicated things that you have quickly defined at the beginning of the talk and everyone has already forgotten.
- Speak quietly or mumble if possible. If you can't, then at least use a monotone voice.
- Try not to make any explicit connections between parts of your talk, compare different definitions, or clarify relationships between theorems. Let people in the audience develop their own logical skills.
- Try to keep the amount of examples to a minimum. It's an absolute waste of everybody's time.
- This amplifies many of the previous points: make sure to demonstrate that you know your topic. Never talk about something which anyone can find to be too easy, or give simple examples. Talking about your technical definitions and results is the way to go!

4. How to Start and How to Finish

People will never remember everything you said, so it's important to start well and to finish well. Here are useful tips for you to keep in mind in your next talk.

Starting the talk.

- Never, and I repeat, never, start with any motivation regarding the field you work in, the general questions in this field, or big results in the last decades prior to work. They are here to hear about your recent work, not for a history lesson.
- Never give out the plan of the talk, or what kind of results you will be talking about. Keep this a mystery!

- A much better way to start is to give a very technical definition specific to your work. We are all mathematicians after all and definitions are the most important thing, right? If you have several obscure related definitions, each building on the next, that's one of the best ways to start a bad talk.

Finishing the talk.

- In my experience, the best thing to do is to go at least 10–15 minutes overtime. There are some truly creative ways of achieving this. For example, do not inquire beforehand about the intended duration of the talk, and never check the time. Show innocent and sincere surprise when you are already 10 minutes overtime and ask the chair for permission to take 5 more minutes. After that, make sure to take 10!
- Never give any summary of what you have been talking about. The surest thing to impress the audience is the ability to finish in the middle of a very technical proof. Of course, as you are running out of time—or are already overtime—you must give this proof at double speed!

5. How to Deal with Questions

A general principle is that questions from the audience are distracting you and everyone else from the main results you are trying so hard to convey. With this in mind:

- Use every opportunity to discourage questions. One of the best ways to do this is to be clear that the question that someone asked was trivial. In your response, emphasize that the answer is obvious, or hint that the question was not a very clever one. When you get good at this, you don't even need to explain what the answer to their question is.
- Try to be generally dismissive about questions. That is, never admit that the question was relevant, and get back to what you were talking about before they interrupted you as soon as possible.
- One strategy which often works to avoid unwelcome questions: don't make any pauses in your speech (here is where monotone delivery helps), so that no one can use a pause to jump in and ask you a question. If they still somehow manage to start asking, it will be much easier for you not to hear it!
- It will work even better if you keep looking at the board and never at your audience. This will also cover the situation if someone tries to raise their hand before asking the question.

If you do get a lot of sensible questions from your audience throughout the talk, it probably means that your talk is not bad enough at that point. Aim to confuse everyone so much that no one is able to come up with

a sensible question unless they are your advisor or your collaborator.

Concluding Remarks

Use this advice consistently and your talks will certainly be quite bad. This is just the tip of a bad talk iceberg. You can fully develop your ability to deliver bad talks only after a lot of practice—although some of the points above come quite naturally to some people (I have to admit, myself included). In any case, experiment and find what works for you!

In this note, I concentrated on math research talks, but the same principles apply in other settings. For example, you can use this advice, with appropriate modifications, in your undergraduate lectures, public lectures, or even in your university open day talks! For more ideas on how to give bad talks, not just in mathematics, see Patterson’s “Ten commandments” [P]. Finally, if you would like to know how to write mathematics badly, I highly recommend Serre’s excellent lecture [S], which also served as an inspiration for this paper.

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