

Mind Wandering during Lectures

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Abstract

Lectures, panel discussions, and conferences are formats for collective listening, but they have developed conventions that make perception difficult. In this drawing-based talk, I will dissect the decorum of academic presentation formats and outline how the attention of the members of the audience diverges and converges with that of the lecturer. I will compare cognitive advantages and disadvantages of various presentation tools from the present and the past. I will also suggest that once a piece of research has been reduced to a text format, it might be difficult to add other modes to it later without them being auxiliary, and that, if we don't pick our presentation tools, the tools we use might be nudging us into doing research that fits them.

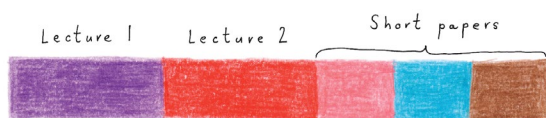
1 This is not an oral paper

In "Singing Euclid: the oral character of Greek geometry" [1], Viktor Blåsjö argues that Euclid's *Elements* wasn't written as a text but as a recording of spoken presentations—"Writing was merely the oral explanation put down on paper (or papyrus, rather)", and adds that the medium of text wasn't used yet to its full potential.

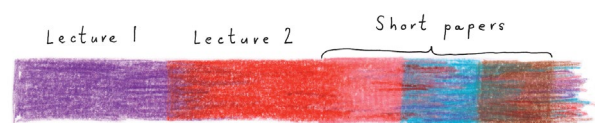
Today it's the other way around. Text became so dominant in academia that even conference presentations are called "papers" or "oral papers". The properties of text spill into talks. I've prepared my contribution to the conference as a talk, not as a paper, and I want to present it in these proceedings as such. Therefore, it is written as if it was spoken, and the images are embedded directly into sentences, since drawings and speech are like two legs that move the lecture forward.

2 Presentation conventions

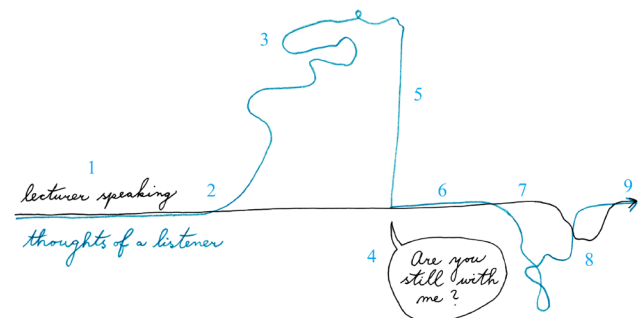
The program of conferences looks something like this



with a clear distinction between where one presentation ends and where another presentation starts. But when presentations are interesting, you keep thinking about them even when another speaker is already speaking. So, in our minds it looks more like this:



And something like this happens also during single lectures:



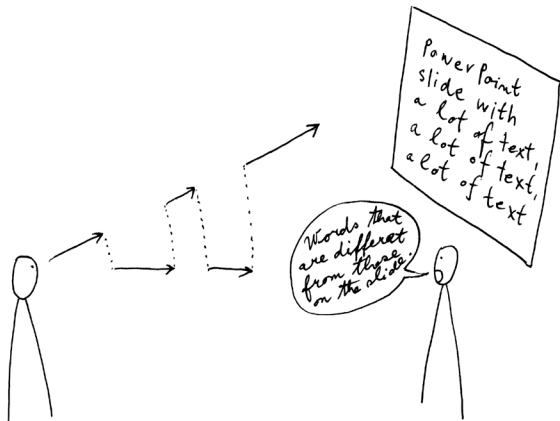
1 A lecturer is giving a lecture, so her mind is hopefully paying attention to what she is saying. A listener, at least at the beginning, is also paying attention, so they are both thinking about the same thing at the same time. But then 2 maybe the lecturer says something so interesting that it will 3 spark the imagination of the listener and their thoughts will diverge from those of the speaker. Until the speaker notices it and says 4 "Are you still with me?", which interrupts 5 the line of thoughts of the listener and brings them back to those of the speaker.

And then the lecture continues 6, and maybe after a while the lecture gets too boring 7 or too complex, so the listener gets lost again. And occasionally, especially when it looks like nobody is paying attention anymore, the speaker gets disconcerted and loses her attention as well 8, which is awkward and, unfortunately for the speaker, usually attracts the attention of the listeners. And, for situations like this, the artist Daniel Yovino recommends [4] to have ready a card with an emergency conclusion, which will help 9 to bring the lecture to the end.

Conferences are formats for collective listening, but they took on conventions that make listening difficult: You sit quietly for a long time without moving, looking in one direction. The program is usually very dense, so there is little time to think about what has been said. Lecturers, especially in humanities, often read aloud complicated texts that are good for reading, but not for listening. Sometimes there is no good place to put notes or a text, so the lecturer ends up holding them in hand. In some settings, you must hold a microphone in the other hand, so you end up having no hand left for gesturing.

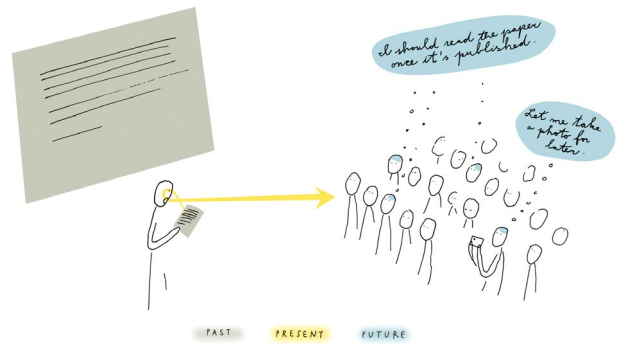


When you're presenting, it feels like you have to have a PowerPoint presentation. Slides sometimes include texts that are different from what the speaker is saying, so, as a listener, you don't know if you should keep listening to the speaker or read the text on a slide.

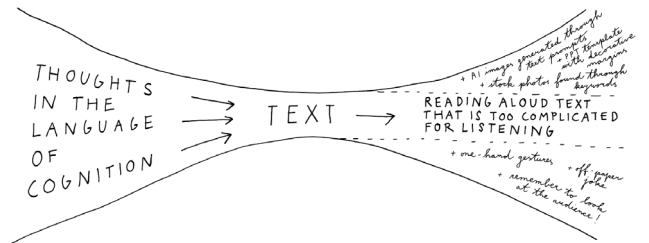


Also, lecturers tend to click through slides very quickly, as if the eyes of the listeners were photo cameras able to perceive everything within one blink.

In academia, there is a preference for text. When an image gets shown, it is rarely trusted by itself, and a verbal explanation is added. Journal articles are valued more than presentations at conferences. Lectures are live readings of future articles. Instead of being together in the present moment, the lecturer reads a text prepared in the past, while the listeners are deciding whether they will read the text when it's published.



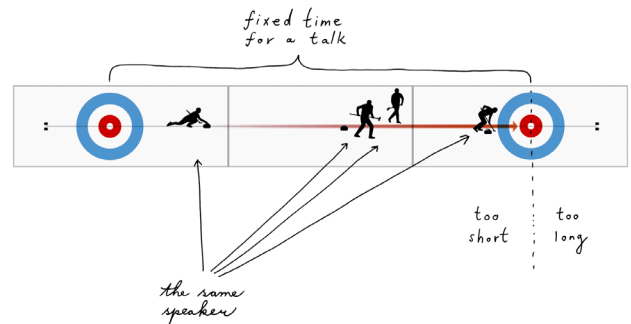
Unlike text, the lecture is a multimodal format, so besides the verbal mode, there are also intonation, gestures, images, sounds, facial expressions. But when a piece of research has been at first reduced to the verbal mode, it might be difficult to add other modes later without them being auxiliary. To convert text into a lecture, we could subsequently add:



- + images for illustrative purposes like stock photos found through keywords or AI images generated through text prompts
- + a PowerPoint template with decorative margins
- + one-hand gestures (if you have a hand left)
- + maybe an off-paper joke
- + and don't forget to look from time to time at the audience!

The oral paper has become multimodal, but it's an awkward multimodality.

Many conferences are strict about timing and this aspect of giving a lecture reminds me of curling.



They give you, let's say, 20 minutes. Now, you don't want to finish too early, because then you look like you have not much to say. But, if you pass the time limit, then they may cut you off and you won't finish your argument.

For many lecturers the given amount of time is not enough, so they search for ways to squeeze as much material as possible. One of the techniques is to write the whole lecture down, and, as the end of the lecture is approaching, read the text as fast as possible. The lecturer is satisfied that he said everything he wanted to say, but the listeners weren't able to perceive it.

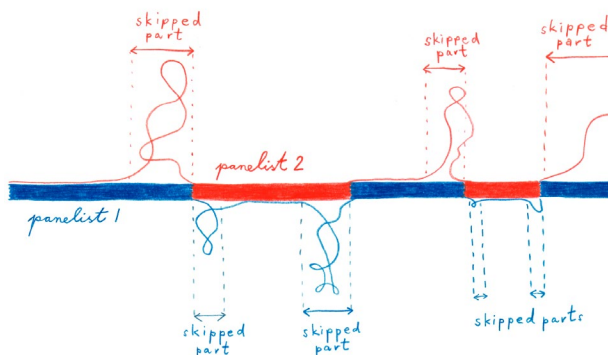
Now let's look into panel discussions. Here we have two or more people speaking one after another.



Ideally, the panelists would have time to prepare their reactions to what other panelists have said.



But silence during panel discussions is considered awkward—in art history terms, we could say that there is *horror vacui* of silence. So, panelists talk right after each other, which means that they have to prepare their reactions while the other panelists are still speaking.



This can lead to embarrassing situations when a panelist later asks about something that has been already answered.

Not paying attention is usually considered a bad thing. But there are various reasons for not paying attention. It's like when you read a book. Sometimes you zone out because you're too tired or because something important has happened during your day, so you keep thinking about it. But sometimes you stop reading because you start to ponder about what you've just read. Reading doesn't consist only of reading itself but also of thinking about what you've read.

When you are not paying attention during a lecture because you have started to think about something that you've heard or seen during the lecture, it is a good thing.

3 Time for mind wandering, fixed or flexible, in or out of touch

Now let's compare various presentation formats and tools to see if and how they provide for mind wandering, whether they allow improvisation, and if they reinforce or suppress the pointing gesture.

Outside academia, there are genres where time for mind wandering is already embedded in the format. Radio interviews (but not podcasts) are intermitted by songs after about every 10–15 minutes of speaking. Within songs, there is a refrain—a part that repeats itself, so you don't have to pay attention to it as much. Movies end with closing credits which gives you time to sit in the dark with music for several minutes and let the movie sink in. And then the Catholic church has a genre called the way of cross, where there are several stations scattered around a hill, usually little chapels, and in each station, there is one "slide" (if we would call it in conference jargon), usually in the form of a painting or a relief. Participants walk from one "slide" to the next "slide", so the time for mind wandering is connected with physical wandering.

But even within academia, before the spread of PowerPoint, there were presentation tools that provided time for mind wandering. When you used a chalkboard (also called blackboard), you had to clean it, which took quite a lot of time. And, if you did it quickly, there was another advantage to it: the board held a memory of what had been there before. The most recent notes were sharp, the older ones were fuzzy, the transition between them was slow, much slower than the transition between the slides in PowerPoint.

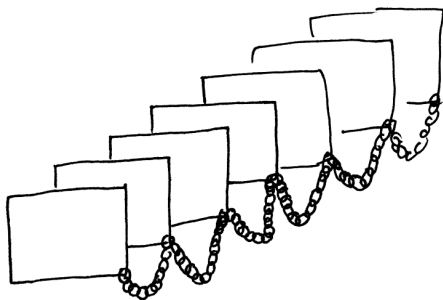
Chalkboards were replaced by whiteboards, as if they were the same thing, as if the whiteboard was an equivalent of the chalkboard. But there are significant differences when it comes to their use properties, the aesthetics, and the dynamics of the presentation. The chalk allows you to draw lines of various thickness: you can write with the end or with the side, and you can adjust the thickness by breaking the chalk. The chalk also responds to how strong you push (like the piano), so you can make a gradient. With a marker, you can only draw with its tip.

The surface of the chalkboard is a bit rough, so when you write, it invites you to pause, you can lean on it with the chalk, so your arm can rest while you decide how to continue. This also creates a bit of suspense when your audience tries to predict what's going to come next. This

is unlike writing on the whiteboard, the surface of which is slippery, so it provides no time to rest.

Writing with the chalk was slow, so you wrote only what was necessary. The chalk forced you to be concise. The computer keyboard makes typing too easy, which makes the PowerPoint slides wordy. On the contrary, drawing with chalk was easy. Drawing with the keyboard is impossible, and drawing with a mouse or a touchpad is slow and clumsy.

Before the spread of PowerPoint, lecturers used the overhead projector. Unlike in PowerPoint, where slides are bound together and, if during the lecture you decide to skip something, you have to quickly show everything that you wanted to skip,

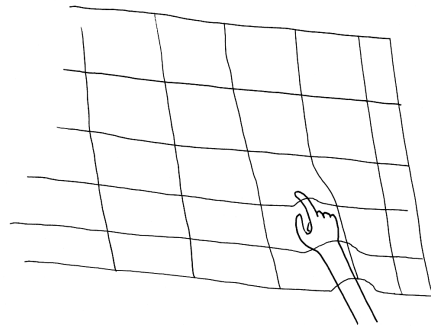


with the overhead projector you can improvise. You can add or skip slides without the audience knowing, you can draw live, and you can superpose multiple layers of transparencies, like Roger Penrose does [2] when he explains the Schrödinger's Cat thought experiment.

Also, with the overhead projector you can touch your slide, you can point your finger on it.



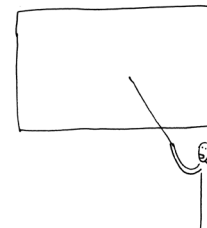
With the digital projector, you're not touching the slide. The slide is like a blanket that covers you.



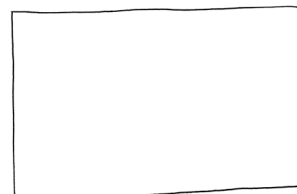
But even like that you can point only in small settings



because the bigger the speaker,



the bigger the lecture room,

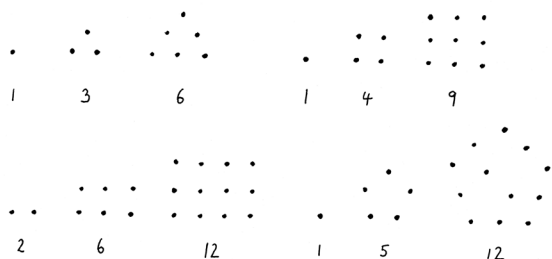


and your slides are getting out of touch.

4 Following tools

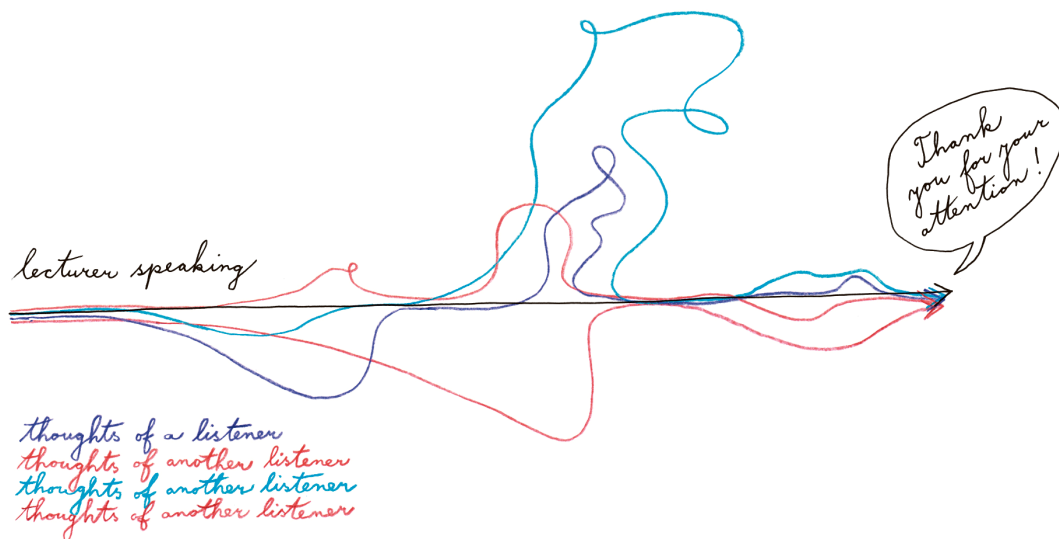
Presentation formats and tools change over time. Today we use PowerPoint and the whiteboard, 30 years ago we would use the overhead projector or the chalkboard, 200 years ago the magic lantern, and 2500 years ago we would

draw in sand, like Pythagoreans probably did.¹ Today researchers don't draw in sand, because it would feel too eccentric, and they (with the exception of Roger Penrose) don't use the overhead projector, because it would feel too retro. We tend to stick to what's currently the standard. But if Pythagoreans used PowerPoint, or even if they drew on a vertical surface like a chalkboard, they wouldn't be able to add little stones, and so they possibly wouldn't research figurate numbers.



Small stones catalyze ideas about figurate numbers better than other tools. If we don't pick our presentation tools, the tools we use might be nudging us into doing research that fits them.

So, thank you, in case you managed to pay attention, but also if you were mind-wandering.



¹ There is a nice drawing by Michal Škrovina in Milan Hejný's book *Geometria naučila člověka myslit'* (SPN, 1979) showing Pythagoreans drawing in sand. Raviel Netz in *The Shaping of Deduction in Greek Mathematics* (Cambridge University Press, 1999) argues that preparing sand for drawing would be too demanding, but the existence of ancient Greek vases from circa

References

- [1] V. Blåsjö (2020). Singing Euclid: the oral character of Greek geometry. Podcast episode and blog post. In: *Opiniated History of Mathematics* (podcast) and *Intellectual Mathematics* (blog). Posted June 21, 2020, <https://intellectualmathematics.com/blog/singing-euclid-the-oral-character-of-greek-geometry/>.
- [2] R. Penrose (2014). *Consciousness and the Laws of Physics*. Video. Filmed April 13, 2014. Posted October 2015 as "Sir Roger Penrose - Keynote Speech at Towards a Science of Consciousness 2014". <https://www.youtube.com/watch?v=dFs-N-XFkQ0&>.
- [3] M. Stanová (2025). *Mind Wandering During Lectures*. Video paper. In: *Proceedings of the 1st symposium Forum Artistic Research: listen for beginnings*. <https://doi.org/10.22501/rc.3847167>
- [4] D. Yovino (2008). *How to Live Productively Using Your Hipster PDA*. Video. Filmed November 29, 2008, at "The Art of How-To" in the Koret Education Center of SFMOMA, San Francisco. Posted May 20, 2010, by Daniel Plus Yovino on YouTube. <https://www.youtube.com/watch?v=-HqMV7XNfs4>.

450 BC where teachers and students draw with long sticks on the ground suggests otherwise (e.g. Louvre, collection number Cp 977, catalogue number G 448, tagged "scène d'école". <https://collections.louvre.fr/en/ark:/53355/cl010270297>)