9.71 Functional MRI of High-Level Vision
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fMRI of High-level Vision

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HOW TO GIVE A PAPER PRESENTATION

(based in part on notes from DiCarlo)

Scientific oral presentations are not simply readings of scientific manuscripts. Nevertheless, at an overall level, your scientific talk should be organized into sections that parallel the sections in the scientific paper. As in the scientific paper, the key sections are:

1) **INTRODUCTION: The rationale for the experiment (why did you do it?)**
2) **METHODS: The methods that were used (how did you do it?)**
3) **RESULTS: The results obtained (what did you find?)**
4) **DISCUSSION: An interpretation of those results (what does this mean?)**

Although not part of a standard oral presentation, you should end your talk with:
5) CRITIQUE AND GROUP DISCUSSION: Your job as presenter is to not only present the paper, but also lead class discussion of its strength & weaknesses and how this work might be extended in the future. To help focus the class discussion, end your presentation with a list of approximately three major questions/issues worthy of further discussion (see below).

1. INTRODUCTION

The first 1 or 2 slides should introduce your subject to the audience. Very briefly (you only have about 20 minutes total, including discussion) give a concise background. Explicitly state the question addressed in the paper. Start with the "big picture" and then immediately drive to how your study fits in the big picture (one or two sentences.) One option that often works well in a talk is to state your major conclusion(s) up front. That is, in a few sentences, tell the audience where you will lead them in this presentation. (e.g. "Although previous studies have found that the fusiform face area responds selectively to faces, in this talk I will show that, under certain conditions, the FFA responds almost as strongly to bodies as to faces.") Whether or not you do this, **all presentations must include a slide that comes up near the beginning of the talk (within the first 3 slides) with a title that says "The Question", in which you state as simply as possible the main question addressed in the paper.** (Sometimes there will be two or max three questions, but do not include more – if the paper addresses more than three questions it is your job to select only the most important ones.)

2. METHODS

There should be 1 or 2 methods slides that allow the audience to understand the overall "logic" and design of the experiment.. Critical here for imaging experiments is an explanation of the

stimulus and the task: **what variables were manipulated, what was compared to what, and what mental processes are the researchers trying to isolate with this comparison?** Also important here is a discussion of whether particular brain regions will be targeted in a given experiment: is this a whole-brain exploratory experiment, or an experiment designed to test a particular hypothesis about a particular region or the brain, and if so what region? Will functional localizers be used? Is this an event-related or a blocked design? Often experimental design is better explanation with diagrams than words. Also, your job as presenter is to select only the most important aspects of the experiment to explain, not to distract the listener with a barrage of less-relevant information. Do not put in details that might be appropriate in a paper (people can ask about them at the end if they are interested). For example, "7 subjects were functionally scanned at 3T while… …" NOT: "The a Siemens 3T TRIO scanner (Siemens, Erlangen, Germany) at the MGH/MIT/HMS Athinoula A. Martinos Center for Biomedical Imaging in Charlestown, MA; A Gradient Echo pulse sequence was used with a TR = 1.5 s and TE = 30 ms …"

3. RESULTS

The next slides should show the major results. If appropriate, it is nice to start with a slide showing the basic phenomenon: activation blobs, and/or time courses, **with graph axes clearly labelled.** Even though your axes are labeled, start the discussion of any data by first telling the audience what your axes are. It is fine, and usually a good thing, to reminding the audience of anything they may already know but that is relevant to understanding the data, just to help orient them (For example, "here is the fMRI response as a function of time, showing the usual peak around six seconds after stimulus onset, tailing off around twelve to fifteen seconds after the beginning of the trial."). Next, show figures that clearly illustrate the main results. All figures should be clearly labeled. When showing figures, be sure to explain the figure axes before you talk about the data (e.g., "the X axis shows time. The Y axis shows the fMRI response.").

To make these slides it is often easiest to export the images from the original paper and import them into powerpoint.

4. DISCUSSION (Conclusions)

List the conclusions in clear, easy-to-understand language. You can read them to the audience (provided there are not too many words). However, don't have a lot of text on the screen if you will be simultaneously saying something else; people cannot pay attention to both. For this course, **I virtually insist that you return to your "The Question" slide, reminding your listeners what the question was, then adding in the answer just below (perhaps under a heading "The Answer", and perhaps as a pop-up).**. Also give one or two sentences about what this likely means (your interpretation) in the big picture (i.e. come full circle back to your introduction) and perhaps some future directions.

5. CRITIQUE

Please end your presentation with at least two or three major things that should be discussed. These should consist of things like: was there a major confound in the study, or an alternative account of the data that the author did not discuss? Here is the place to mention anything that might be improved in the study, any additional experiments that you think might be appropriate (better?), and general theoretical issues about the topic investigated (i.e. put the study in the "big picture" of object recognition, visual attention, or whatever the topic is). Discussion from the

audience should be especially encouraged at this point, but you should be prepared to foster this by raising these issues (e.g. one slide with a list of issues).

Often there is an awkward moment at the end of a talk when you trail off, people don't know if you are finished, and no one whows whether to clap yet. You can avoid this awkward moment by pausing briefly, looking at the audience, and saying, definitively and with closure: "Thank you". That makes a nice, crisp, socially comfortable ending.

Overall tips:

- Control of time. For most conference presentations, interruptions are not allowed and questions are held until the end. Ffr this class we will take only questions of clarification during the presentations, holding discussion till the end.

- As a rule of thumb, you should have no more slides than the minutes allowed for the presentation (e.g. 15 slides for a 15 minute presentation), but less is better.

- Data reduction. **One of your most important tasks as a presenter is to figure out what NOT to present.** You could of course give people the paper and they could read it themselves. The point of a talk is to get the critical information across in much less time than it takes to read a paper. Thus, in any good talk, there will be a lot of information in the paper that is not in the talk. A big part of your job in preparing the talk is to decide what is important to understand the study. In general, less information means more clarity (up to a point).

- Establish eye contact with your audience. If they are alert and looking at you, even nodding, you know you are on track. If they are frowning then you are losing them. If you are unsure, at least for a small group, ask them: "is that clear?" (people will rarely say no, so if you don't get a lot of encouraging nods, go over it again, trying to be simpler.) In a good talk (though maybe not a conference presentation to a large audience) you should feel like you are having a conversation with your audience: even though they may not be saying anything, you are watching them all the time to see if they are with you. If you have just gone through a complicated explanation, and you are not sure your audience has tracked you, synopsize the slide with a simplified statement by saying for example "So in other words, the logic of this experiment is to compare X to Y to find the brain locus of Z."

- show enthusiasm for your topic. Both enthusiasm and boredom are contagious.

- As you put up each slide, have in mind the key points you want to make with that slide (one or two points). When you are preparing and designing the presentation, think: "Why is this slide in here?" If you cannot think of an important reason, the slide probably should not be in the presentation.

- Speak in short sentences and use easy to understand language. Avoid jargon. If you are a cognitive neuroscientist, think about how you would like a molecular biologist (i.e. a scientist who knows something about neuroscience, but is not an expert in your particular field) to present to you (and vice-versa).

- Practice, practice, practice! No one, no matter how experienced, can give a good short presentation like this without practicing it straight through at least two or three times. Once you get your talk in decent shape, practice it on your friends. If there is anything they don't understand (even if they are not course 9 majors) that is probably something you need to fix.

- With enough practice, you will find that once you are into a presentation, it will flow smoothly (you have already put the work in to create the proper slides and have thoroughly practiced presenting the key points of each slide before you even walked into the room). However, because you may be facing a large audience, you may feel more nervous than during your practice sessions (often practiced alone). Thus, the goal is simply to "get started" with the presentation. Once you are started, the nervousness will disappear as you are now "in your familiar zone" (well practiced). A very helpful tip here is to **memorize your first few sentences.** When you get up to speak, these will almost reflexively come out of your mouth and launch you into your presentation.

- If there is a possible concern about the study that you don't have time to address in the talk (but you think you might get asked about), have a slide (or a few) ready to address that point that you can put up if/when asked. It always looks good to show that you have anticipated a question.

- 95% of the work is done before you even show up to give the presentation:

- **Don't have too much information (particularly, too many WORDS)** on each slide. Use the pop-up feature of powerpoint to avoid snowing your listener with too much information when a first slide appears. The goal should be clear slides, with large fonts and minimal clutter. Avoid complex and distracting backgrounds.

- Slides are organized along the primary topics discussed above.- You have practiced the entire presentation and worked out any "rough spots". You know what slide is coming next before it pops up, so you can make a nice smooth segue from the current slide to the next one. If you have to look for a moment at a slide to remember what you want to say about it, that is bad.

- Because you have practiced so much, you are confident that the presentation is at the expected time limit, so there is no reason to rush or to become concerned with the clock. You can relax and enjoy showing off your grasp of the study and your well-polished presentation.