

Making a winning research presentation

When you attend a bunch of science presentations, it becomes clear that the best presentations (and those that win awards at conferences) follow a set structure. Following this structure will make developing presentations easier, allowing to focus your efforts on the meaning of your research and developing stunning visuals.

Formatting a professional-looking presentation

The rules

- **Text size:**
 - No text below 24-point font. If you have figures in your presentation, be sure that the size of axis text and labels is adequate to be read from the back of the room.
 - Give yourself a reasonable cap to your text size -- I like to cap at around a 48-point font.
 - Be consistent with font sizes, for example perhaps all headings are 48-point, sub-headings are 36 point, and "paragraph text is 24 pt.
 - Limit yourself to a few different text sizes (perhaps a maximum of 4 different sizes).
- **No full sentences** -- keep text to a minimum!
- **Images:**
 - Make your images as large as possible.

- Avoid filling a slide with loads of images (give yourself a maximum of 4 per slide).
- If your slide includes multiple images, be sure that the size of the images are equivalent (unless the image size is an intentional design element)
- If your size includes multiple images of the same size, be sure that the position of the images is equivalent across any relevant axes (e.g., all images share the same horizontal or vertical position).
- Use the Format Picture dialogue and numeric values to define the size and position of images (rather than dragging with your mouse).
- White space and cropping can pose a challenge with consistent image formatting/positioning. I recommend using an external program (e.g., Inkscape (free and open source, [link ↗ \(https://inkscape.org/\)](https://inkscape.org/)), Adobe Illustrator, Gimp (free and open source, [link ↗ \(https://www.gimp.org/\)](https://www.gimp.org/)), Adobe Photoshop) to resize images prior to importing into PowerPoint. For R figures, I recommend playing with the plot theme such that the saved output is exactly as it will appear in PowerPoint. I will occasionally modify R figures in Inkscape and/or Adobe Illustrator prior to importing into a presentation.
- **Canned themes and designs:** Avoid using Microsoft PowerPoint themes or design suggestions -- these almost always give a presentation an unprofessional feel.
- **Animations:** Use animation **only** when it contributes to the meaning of the presentation.
- **Font families:**
 - Use a single font family for your entire presentation (e.g., Avenir).
 - Choose san-serif fonts (**but** if you think I'll be super judgy about "choosing" Calibri, you're totally correct).
 - Choose a font family that is available on Mac or Windows. I have a love of fonts, but have been horrified when I found a nice custom font online for my presentation and then it got translated to Calibri on the presentation computer. *Note: In class, your presentations will be on a Mac, so Mac*


users are safe but Windows users should ensure that the font they use is available on Mac.

- **Object positioning:** Be as consistent as possible with the positioning of objects (text or images). For example, if your slides include a header, use Format Picture/Position to place each header in the same location.
- **Background color:** Whenever possible, use black as the background color (or another dark color). If a slide includes images with white space (like ggPlots), use a white background such that the white space in the image blends with the background.
- **Never, never, never use clip art!**
- **Avoid using PowerPoint drawing/shape tools:** Nothing ruins a good presentation like PowerPoint drawing elements (e.g., shapes like arrows, boxes, or flow charts). They look super sloppy. Use a vector drawing program like Inkscape (free, [link ↗ \(https://inkscape.org/\)](https://inkscape.org/)) or Adobe Illustrator instead.
- **Aspect ratio:** Size your slides for modern widescreen formats (16:9)
- **Compress pictures** prior to sharing your presentation

Some extra tidbits for a crazy good presentation

- **Maintain consistency between slides:** When the subject matter of adjacent slides is similar (e.g., they have the same heading, but different content), it's a good idea to keep all shared content the same and only modify the content that has changed.
- **Generate a visual narrative:** I strongly suggest watching a Wes Anderson movie to get presentation ideas. My favorite thing about his movies (e.g., the Life Aquatic) is that he creates an underlying visual narrative that corresponds to the narrative of the movie. He uses incredible color palettes, but what is more interesting is that each of the primary characters get their own color palette, as do locations. As a Wes Anderson film progresses, the position of characters on the screen, the color palette, and the background tell a story that's as strong (and sometimes stronger than) the movie's script. With some intention (and a good degree of subtleness), you can use object placement

and colors to do the same thing in a presentation and it often yields really pro-looking results.

- **Use conceptual infographics:** Use a vector-drawing program (e.g., Inkscape, [link](https://inkscape.org/)  [\(https://inkscape.org/\)](https://inkscape.org/)) to create a diagram that provides a simplified visual explanation of a complex process.
 - **Think about white space:** The space between objects (including text) communicates a lot to the feel of a presentation. Lack of thought for white space can create a presentation that looks sloppy. For example, the distance between a text box and the elements above and below (or left and right) should be equivalent.
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An outline for a winning 5 minute research proposal presentation

Note: Aim for 5 slides total, not including the title slide, and see time suggestions below (practice to hit them!).

1. **Title slide** (1 slide; time: none): You don't have to say anything over this one.
2. **The umbrella** (1 slide; time: 30 seconds max): The context of your research in the broadest terms possible.
3. **Mini literature review** (1 slide; time: 1-1.5 minutes): Provide a background in what we know about system that you are researching, including what we don't know about the system.
4. **Research question, hypotheses, predictions** — 1 slide; time: 1-2 minutes): Here is where you provide your research question about the answer to your question (qualitative hypothesis or hypotheses), and predictions.
5. **Proposed methods/test** (1 slide; time: 1 minute): Describe your study area, the data you will use to address your question, how you will test your predictions.
6. **Conclusion** (1 slide, time: 30 seconds max): Describe why this study is important, linking back to the umbrella statement (e.g., "... this study will help

us solve the problem of ...") and call for questions.

An outline for a winning 12-15 minute research presentation

Note: Aim for roughly 15 slides total, not including the title slide.

I. Introduction

1. **Title slide** (1 slide): You don't have to say anything over this one.
2. **The set-up** (1 slide; time: 30 seconds max): One or two sentences - say something intriguing to pull in your audience. Have a listen to the start of a few TED Talks (though I find TED Talks annoying). They almost always do this, following by a short pause to let the weight of their statement sink in. Do avoid resorting to cliches and straying from the topic of your research. This should be one slide, a picture without text is often a good choice for this one.
3. **The umbrella** (1 slide; time: 30 seconds max): Following your exciting statement above, provide the context of your research in the broadest terms possible.
4. **Mini literature review** (1-2 slides; time: 1-2 minutes): Without yet giving away your research question, provide a background in what we know about system that you are researching.
5. **Holes** (1 slide; time: 0.5-1.0 minutes): What don't we know about the system that you are researching? Specifically, what don't we know that you intend to address with your research?
6. **QHPT** (1-2 slides; time: 1-2 minutes): Here is where you provide your research question (a nice transition from "Holes" above!), your best guess(es) about the answer to your question (qualitative hypothesis or hypotheses), predictions (i.e., expected patterns if the hypothesis is true — you should be able to plot these and such plots would be a great accompaniment for these slides).

II. Methods

1. **Study area and site selection** (1 slide; time: 1-2 minutes): Describe the region that you are focusing on, paying special attention to why it is appropriate for addressing your research question. This region represents the extent of your full study — for example, if you are sampling from multiple cities distributed across the conterminous US, the study area is the entire conterminous US. If you are sampling a subset of locations in your study area, describe how you chose the subsets and how these subsets are appropriate for your QHPT. Conversely, perhaps you are sampling contiguous polygons across your study extent (e.g., census tracts in Washington DC) — if this is the case, describe how those polygon boundaries were determined and why these boundaries are appropriate for investigating your QHPT.
2. **Data acquisition, description, and processing** (1 slide; time: 1-2 minutes): Describe where you got your data, key features of the data, and highlight the processing you conducted to get it ready to address your question. Your description of the data should include the number of features (e.g., number of polygons or points if a shapefile or pixels in a raster), CRS, and spatial scale (resolution and extent) for each file used. Your description of processing should avoid mundane tasks (e.g., “I then used pivot_wider to change the data from long to wide form ...”) — instead focus on big picture processing steps and steps that are unique to your work or important for the narrative of your talk.
3. **Statistical tests** (1 slide; time: 0.5-1.0 minutes): Because we will barely touch on statistics, these can take the form of summary statistics, data visualization, or formal statistical analyses. These are the tests of your predictions. Here, you describe how you carried them out and what to watch for when interpreting your output.

III. Results and Discussion

1. General overview (1 slide; time: 0.5-1.0 minutes): Just some summary statistics and/or perhaps a summary plot (e.g., histogram).
2. “Statistical” results & discussion (1-2 slides; time: 1-2 minutes): Here’s where you describe the outcome of your tests. Link it back to your predictions and

hypothesis, describing what each result means in the context of your QHPT. Be sure to include caveats — regardless of whether your findings yielded supportive evidence for your qualitative hypothesis, what could have been done differently? What are the weaknesses in your study design?

3. Link your results back to your research question and holes (1 slide; time: 1-2 minutes): How do your findings inform your research question? Have they filled in any of the holes that you described in your intro?
4. The to-do list (1 slide; time: 1-2 minutes): What are the next steps you should take to address your question and fill holes? If you described your caveats well above, this should be easy.
5. Conclusions (1 slide; time: 0.5-1.0 minutes): Place your research back into the context of the umbrella statement that started out your talk. This can also be used to request questions from the audience.