How to give a scientific presentation

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Note

This is not a scientific presentation
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What I say is the truth
(but not everyone will agree)
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What I say is the truth
(but not everyone will agree)

This isn’t a particularly good talk
Why give a talk?

• You’re compelled to

• For practice  (eventually, you’ll be doing it a lot)

• To get a job  (an indication of teaching ability)

• To tell people stuff

• To become known

• To get people to read your papers
Basic principles

• Know your audience (don’t overestimate them)
• Take it seriously (you’re being judged)
• Keep things simple (have one or two key points)
• Tell a story
• There are lots of ways to be good (and bad)
• Know yourself (adopt another’s style at great peril)
• Go to lots of talks and pay attention
• Images over text
Multiple imputation

Genetic map:

Observed data:

Imputations:

- AA
- AB
- missing

Legend:

- AA
- AB
- missing
Multiple imputations
More basic principles

- Humor can be good
- Start with an application
- Nobody wants to hear the technicalities
- Give a good summary at the end
- Pay attention to your environment
- Don’t bullshit; admit ignorance
- Don’t go over the time limit
- The content is key
Ways to annoy me

• Spend a lot of time on a useless outline slide
• Unlabeled graphs; unreadable or meaningless labels
• Use graphs/tables straight from a paper
• Use a serif font (e.g., Times)
• Include lots of unnecessary digits
• Include raw computer output
• Read the slides verbatim
• Cover everything you’ve ever done
Outline

• Background
• New method
• Simulation results
• Application
• Conclusions/future directions
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A bad figure
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Table 5
Simulation results for using full data, CRs only, and proposed method under four missing mechanisms

<table>
<thead>
<tr>
<th>Method</th>
<th>$\beta_w$</th>
<th>$\beta_x$</th>
<th>$\beta_w$</th>
<th>$\beta_x$</th>
<th>95% CI $\beta_w$</th>
<th>95% CI $\beta_x$</th>
</tr>
</thead>
<tbody>
<tr>
<td>(M.1)</td>
<td>$P(R = 1) = 0.66$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full</td>
<td>0.01346</td>
<td>0.02229</td>
<td>0.04008</td>
<td>0.03685</td>
<td>0.955</td>
<td>0.950</td>
</tr>
<tr>
<td>Comp</td>
<td>0.03062</td>
<td>-0.003561</td>
<td>0.1149</td>
<td>0.06732</td>
<td>0.960</td>
<td>0.955</td>
</tr>
<tr>
<td>Impu</td>
<td>0.01431</td>
<td>0.021</td>
<td>0.04088</td>
<td>0.05169</td>
<td>0.980</td>
<td>0.975</td>
</tr>
<tr>
<td>(M.2)</td>
<td>logit $P(R = 1) = 2Y$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full</td>
<td>0.007908</td>
<td>-0.02116</td>
<td>0.03838</td>
<td>0.03624</td>
<td>0.975</td>
<td>0.925</td>
</tr>
<tr>
<td>Comp</td>
<td>0.01945</td>
<td>0.07096</td>
<td>0.107</td>
<td>0.06581</td>
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<tr>
<td>Impu</td>
<td>0.006966</td>
<td>0.01597</td>
<td>0.04227</td>
<td>0.05226</td>
<td>0.975</td>
<td>0.985</td>
</tr>
<tr>
<td>(M.3)</td>
<td>logit $P(R = 1) = 2X$</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Full</td>
<td>0.007908</td>
<td>-0.02116</td>
<td>0.03838</td>
<td>0.03624</td>
<td>0.975</td>
<td>0.925</td>
</tr>
<tr>
<td>Comp</td>
<td>0.01225</td>
<td>0.0589</td>
<td>0.08856</td>
<td>0.06818</td>
<td>0.980</td>
<td>0.975</td>
</tr>
<tr>
<td>Impu</td>
<td>0.009563</td>
<td>-0.04699</td>
<td>0.03865</td>
<td>0.04923</td>
<td>0.985</td>
<td>0.970</td>
</tr>
<tr>
<td>(M.4)</td>
<td>logit $P(R = 1) = X + Y$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full</td>
<td>0.01346</td>
<td>0.02229</td>
<td>0.04008</td>
<td>0.03685</td>
<td>0.955</td>
<td>0.950</td>
</tr>
<tr>
<td>Comp</td>
<td>0.02404</td>
<td>1.613</td>
<td>0.1102</td>
<td>0.08202</td>
<td>0.955</td>
<td>0.580</td>
</tr>
<tr>
<td>Impu</td>
<td>0.01814</td>
<td>0.08289</td>
<td>0.0578</td>
<td>0.06075</td>
<td>0.955</td>
<td>0.970</td>
</tr>
</tbody>
</table>

- **Bias** $= (\hat{\beta} - \beta_0)/\beta_0$.
- **Variance**
- **95% CI**

- Simulation variance.
- Confidence interval using jackknife standard error.
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> anova(aov(x ~ factor(d) * factor(sex)))

Analysis of Variance Table

Response: x

<table>
<thead>
<tr>
<th></th>
<th>Df</th>
<th>Sum Sq</th>
<th>Mean Sq</th>
<th>F value</th>
<th>Pr(&gt;F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>factor(d)</td>
<td>4</td>
<td>203.661</td>
<td>50.915</td>
<td>49.3485</td>
<td>&lt;2e-16 ***</td>
</tr>
<tr>
<td>factor(sex)</td>
<td>1</td>
<td>2.199</td>
<td>2.199</td>
<td>2.1317</td>
<td>0.1478</td>
</tr>
<tr>
<td>factor(d):factor(sex)</td>
<td>4</td>
<td>1.923</td>
<td>0.481</td>
<td>0.4660</td>
<td>0.7605</td>
</tr>
<tr>
<td>Residuals</td>
<td>90</td>
<td>92.858</td>
<td>1.032</td>
<td></td>
<td></td>
</tr>
</tbody>
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Signif. codes:  0 ’***’ 0.001 ’**’ 0.01 ’*’ 0.05 ’.’ 0.1 ’ ’ 1
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More ways to annoy me

• Skip the motivation
• Mumble
• Spend a lot of time discussing simulations
• Focus on your computer rather than the audience
• Use a noisy background
• Use a canned Powerpoint background
• Include your institution’s logo on every slide
• Include other useless stuff on every slide
Yet more ways to annoy me

• Use gratuitous animations
• Flash your laser pointer around constantly
• Make extensive references to others’ work
• Write full paragraphs
• Spend a lot of time on technical details
• Use complicated notation that’s hard to remember
• Have lots of typos
• Reveal just a bit at a time
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Preparing the presentation

- What is the take-home message?
- What figures do you want to show?
- What background needs to be covered?
- Want a logical unfolding of the information
- Think carefully about the transitions
• Be consistent  (colors, labels, layout)

• Polished, but not overly so

• Think carefully about colors  (projector vs computer; color blindness)

• Use care regarding graphic type  (jpeg/png vs pdf/ps)

• Design figures specifically for the talk

• Add more illustrations

• Know your slides  (don’t let them surprise you)
The text-free talk

• Can you do it with only pictures?
• Wordy slides seem more for the speaker than the audience
• Consider index cards (but don’t drop them)
Practice

- Practice by giving talks  (take every opportunity)
- Don’t let practice kill your enthusiasm
- Think it through carefully  (imagine what the audience is thinking)
- Focus on the transitions and the tricky bits
- Do you know how long it will take?
- “10 practice runs for one presentation”  (Yikes!)
- Know what you need
- I usually have a good idea for my “opening”
- Videotape?  (Not me!)
Delivery

• How to dress? (reflects your respect for the audience)
• Exude enthusiasm and confidence
• Move around
• Look at the screen, with the audience
• Explain fully or not at all
• Don’t apologize
• Avoid getting yourself stuck; feel free to stop and summarize
• Relax; slow down; occasional silence is okay
• You want the audience to care and understand
Nervousness

- Expect to be nervous *(always)*
- Be prepared
- Know your audience
- Have something to drink on hand
- It’s probably not noticeable
- Use two hands with the laser pointer
- It’s okay to screw up now and then *(I think)*
- It’s easier when you *care* about what you’re talking about
The 10 or 15 min talk

• Think: what is the goal?
• Explain the problem, sketch the solution, give a few results
• 5 – 15 slides
• Simplify, simplify, simplify
• If possible, choose the topic to fit the time limit
PDF vs Powerpoint

● Powerpoint can have terrible graph/font problems

● PDF (almost) always looks as expected
  – PDF can have font problems, too
  – technically you need to “embed” any non-standard fonts
  – but problems are rare.

● Powerpoint makes sharing slides easier

● Powerpoint can be easier to create

● Powerpoint: easier to have color and black/white versions

● Powerpoint’s defaults are terrible
Q & A

• Listen
• Repeat the question
• Be gracious
• Admit ignorance
• “I’ll have to give that some thought…”
• “I’m glad for the suggestion…”
• “I’ve thought about that, but haven’t yet found a solution…”
• Don’t say, “That’s a great question!” for every question
Final thoughts

• You should be able to give a talk on your current work at a moment’s notice

• Simulation results are almost always dreadfully boring

• Not every piece of work makes a good talk

• I always empty my pockets, just in case

• I like to have an index card with slide numbers

• Know your computer; adjust the screen/energy saver times
• M Alley (2002) The craft of scientific presentations: Critical steps to succeed and critical errors to avoid. Springer (Lots of fun stories about famous scientists)


• PB Medawar (1979) Advice to a young scientist. BasicBooks


• PJ Feibelman (1993) A PhD is not enough! Addison Wesley