Creating Your 20.109 Presentation

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The Book of Lists tells us that public speaking is the #1 human fear.
Outline

- Some fundamentals of oral communication
- Structuring the journal club presentation
- Principles of effective visual support
- Delivering the presentation
Oral communication has unique constraints

- Challenge for the presenter:
  - Must communicate in “real time”

- Challenge for the audience:
  - Can’t control rate of presentation to match their comprehension
  - Can’t re-read sections

Maximize signal, minimize noise
Know your material and its message

Content is the key!

- Identify the core idea and why it matters
- Collect *more* information than you will use
- If possible, get a broader context
  - Read a review of paper
  - Read later paper by the same group
- Anticipate problem areas
- Research unfamiliar words, methods, etc.
Know your audience

• Who are they?
• What do they know?
• What might some of them **not** know?
• What do they want to know more about?
A journal club has a distinct audience and purpose

**Audience**
- Fellow researchers (peers)
- Similar (not identical) technical backgrounds
- Not experts on this particular research project

**Purpose**
- Get acquainted with research project
- Understand research in context
- Consider limitations of research
- Learn how it might apply to future projects, work in 20.109
Ask yourself...

• What is the main point I want to make to my audience?

• Why is this interesting or important?

• How do the data support my main point?

• What part of my story can I tell with the data in the allotted amount of time?
To organize the presentation, tell a story

- Engage the audience’s interest as they follow the narrative
- Show how each section relates to and builds upon the one before it
- Leave out elements that are tangential to the story

<table>
<thead>
<tr>
<th>Beginning</th>
<th>Middle</th>
<th>End</th>
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<tbody>
<tr>
<td>Introduction</td>
<td>Data</td>
<td>Summary</td>
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Preview and Review help audience discern structure

- Map out goals of the talk in advance
- Summarize at the end
- Within each section, use topic sentences and recaps
Transitions guide your audience through the logic of the scientific process

Look forward and backward to differentiate and connect ideas

- Articulate the motivation for each step of the investigation before you explain it.
- As you go, explain what questions still remain.
- Most important point of an explanation comes first.
- Use signal phrasing (“Although...” “As predicted...” “Unexpectedly...”)
Introduction establishes context and problem

- Introduce yourself and your subject
  - Slide should have title, author, journal, pub date
  - Paraphrase your title verbally; no need to recite all authors

- In one sentence, introduce the central question or problem of the experiment
  - State significance of experiment; why should we care?
  - Briefly explain necessary background

- Give audience a preview of approach to problem
Data section works to answer central question

- Forms bulk of presentation

- Drawn from Methods, Results and Discussion of paper
  - keep explanation of methods to a minimum -- only as much as needed to understand results
  - integrate discussion as you go
Summary determines what audience remembers

- **Recap**: what are the primary findings?
- **Link back**: how have you fulfilled the need established in your Introduction?
- **So what?**: or, how do these findings contribute to the field?
  - Emphasize the potential interest/utility of findings to your specific audience
  - What might be explored in future work?
Q & A is an opportunity for the audience

• Anticipate questions not covered in the presentation

• OK to bring extra slides

• OK to acknowledge gaps in expertise
  • Explain what you do know

• OK to ask questioner to clarify what they are asking
  • Listen; repeat/rephrase
Visuals exist to support your message

Or: What good are slides at all?

**Disadvantages:**
- disruptive -- pull audience's attention away from the speaker

**Advantages:**
- can convey a point quickly
- add variety and interest
- audience recall increases dramatically when the speaker uses *effective* slides

**Ask yourself:** What specific point are you trying to convey with your visual?
Direct the audience’s focus

Title all slides
• Headings should clarify the main point (conclusion to be drawn) for each slide

Use graphics liberally, keep them simple
• Average attention span per slide: 8 sec

Use clear, explanatory labels for charts and diagrams
• Make sure to label axes!
Less is More

• Limit number of slides

• Say more than you show
  • show primary points on slide; flesh out secondary points verbally

• Minimize text
  • Don’t crowd your slides with a lot of text. Especially, avoid using complete sentences -- or worse, complete paragraphs. Either the audience will become engrossed in trying to read the text, and will stop paying attention to you, or else they’ll wonder why you didn’t just give them a handout already and save yourself the trouble of reading to them.

• Avoid potentially annoying animation
  • Really.
Use color to provide interest and emphasis

- Be easy on the eyes; don’t distract from content
- Avoid low-contrast combinations
Typography should help audience read the text quickly

- Choose clear, simple fonts
- Type at least 20-24 pt
- Limit upper-case type
- Be sensitive to spacing and text alignment
Typography should help audience read the text quickly

Design should never say “Look at me.” It should always say “Look at this.”

-- DAVID CRAIB
Make graphics the core of your narrative

What story does this picture tell?

“As shown in Fig. 2, the loss of neuraminidase activity from the supernatant coincides with the disappearance of this 66-kDa protein. This indicates that neuraminidase activity is precipitated via the 66-kDa protein.”

Neuraminidase activity is precipitated via 66-kDa protein

Approach: Combinatorial chemistry to find peptides that bind and precipitate silver

Phage display library → Identify peptides with affinity for silver → Incubate clones and synthesized peptides with 0.1 M silver nitrate

Develop a method for spatial control of silver deposition

Develop a model for formation

Characterize nanoparticles using TEM

Look for silver nanoparticle crystallization

Iron

• An abundant metal, makes up 5.6% of earth’s crust
• Properties:
  – shaped, sharpened, welded
  – strong, durable
• Accounts for >95% of metals used
• Iron ores discovered in 1844 in Michigan’s Upper Peninsula
• Soon found other ores in upper Wisconsin and Minnesota

Kesler 1994

Iron ores make up 5.6% of the earth’s crust and account for 95% of the metals used. Iron ores can be shaped, sharpened, and welded, and they are strong and durable. The largest concentration of iron ores in North America is found in the Mesabi Range.

[www.star-bits.com]

Iron Ore Distribution

[Kesler 1994]

Alley et al., 2006
Students learning from the transformed slide scored higher on an identical test question

Q: How abundant is iron in the earth’s crust?

Iron

- An abundant metal, makes up 5.6% of earth’s crust
- Properties:
  - shaped, sharpened, welded
  - strong, durable
- Accounts for >95% of metals used
- Iron ores discovered in 1844 in Michigan’s Upper Peninsula
- Soon found other ores in upper Wisconsin and Minnesota

Iron ores make up 5.6% of the earth’s crust and account for 95% of the metals used

Iron ore distribution map

Kesler 1994

Led to 59% recall

Iron ore

Iron ore distribution map

Kesler 1994

Is strong and durable

Can be shaped, sharpened, and welded

Iron ore

Iron ore distribution map

Kesler 1994

Led to 77% recall

p<0.001

Alley et al., 2006
The secret of good delivery is rehearsal

- Practice at least 4 times
- Practice with a colleague for feedback
  - Is your content clear?
  - Do you rock, squirm, gesture too much?
  - Is there room for improvements/adjustments?
- Time yourself
- What 3 questions will your audience likely ask?
Connect with your audience

Work to build rapport

• Establish eye contact; look at people

• Convey enthusiasm; if you aren’t excited about your subject, your audience won’t be either

• Explain novel ideas/terms or references

• Use everyday language and terms

• Clarify connections that may be obvious to you but not them

A presentation is two-way communication

• Pay attention to audience reaction; modify your talk as needed
Extemporaneous speech is most suitable for informal presentations

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<tr>
<td>Reading from written text</td>
<td>Huge safety net</td>
<td>Distances speaker from audience</td>
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<tr>
<td></td>
<td></td>
<td>Little flexibility</td>
</tr>
<tr>
<td>Memorizing</td>
<td>Freedom from notes</td>
<td>Minor interruption can derail you</td>
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<tr>
<td></td>
<td>Security of knowing exactly what to say</td>
<td>Artificial/stagey</td>
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<tr>
<td></td>
<td></td>
<td>Time-intensive</td>
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<tr>
<td>Extemporizing (w/ rehearsal)</td>
<td>Best connection with audience</td>
<td>Can seem intimidating to novice speakers</td>
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<tr>
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<td>Most flexibility</td>
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Project mastery with your body language

• Make non-verbal behavior deliberate; avoid extraneous motion

• Use gestures that complement your speech’s content and are natural for you

• Stand at a 45-degree angle to the audience

• Keep weight evenly dispersed on both feet

• Don’t block the screen!
Maximize the signal in the vocal channel

**Volume**
- Project to back of room: support voice with deep breaths

**Rate**
- Speak at appropriate rate for audience comprehension
- Slow down for especially complex or important content
- Incorporate strategic pauses

**Pitch**
- Keep pitch of your voice at a natural level
- Avoid “uptalk”
Anxiety is normal, but can be overcome

• Practice and prepare
• Visualize yourself succeeding!
• Focus and center yourself
• Breathe
• Have a conversation

Now What?

- Get acquainted with research
- Organize your thoughts
- Design slides
- Practice talk
- Revise
- Deliver talk
- Meet to review video/slides
Sources


• Available to MIT community at https://web.mit.edu/course/21/21.guide/www/home.htm