Delivering scientific presentations and posters for impact

CLIMB
Collaborative Learning and
Integrated Mentoring
in the Biosciences

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Deliver your presentations for impact

But why?

Because reviewers are considering impact

NIH criteria

Overall Impact: Reviewers will provide an overall impact/priority score to reflect their assessment of the likelihood for the project *to exert a sustained, powerful influence* on the research fields involved

NSF criteria

- **Intellectual Merit**
- **Broader Impact**

Let's start with 2 activities

In these activities, what helps and what makes it difficult to remember?

1. **Memorize as many letters as possible**

2. **Remember as much of the text as possible**

What are some challenges in scientific presentations and posters?

What are some strategic advantages in scientific presentations?

We will address:

1. Principles of Effective Communication

- challenges in communication
- ideas that "stick"
- speaking in different communication styles

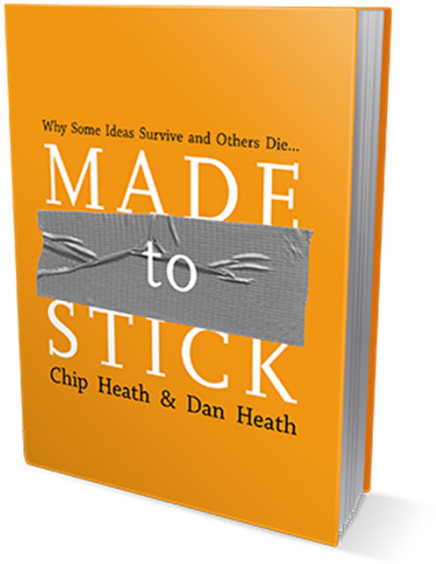
2. Some Practical Suggestions

- tips for creating slides
- good and poor examples
- sample video

Part 1:
Principles of Effective Communication

What's a "sticky" idea?

A sticky idea is understood and remembered, and has lasting impact to change people's opinions or behavior



Similar to the NIH definition for impact

The project must exert a *sustained, powerful influence*

Why is it so hard to communicate effectively? Because of The Curse of Knowledge

- **Research at Stanford with tappers and listeners**
  - tapper was given a popular song
  - listener had to guess the song
  - beforehand, tapper was asked to predict the % of songs that would be guessed correctly
  - tappers predicted: ~50%
  - actual: 3% (!)

- **The Curse: those with knowledge (tappers) are cursed with not understanding the audience's (listeners) perspective**

telling ≠ effective communication

Instead, transform your ideas to

Transform your ideas to stick

Use as many of these 6 key principles as possible:

Simple: find and share the core message

Unexpected: get their attention – surprise or twist

Concrete: help people understand – be specific

Credible: help people believe – give evidence

Emotional: help people to care – inspire

Stories: share ideas to simulate and inspire

Speak to a broad audience using the Myers-Briggs types

How do you prefer:

- to relate to people?
  - **E**xtroverts
  - **I**ntroverts
- to gather information?
  - **S**ensors
  - I**N**tuitors
- to make decisions?
  - **T**hinkers
  - **F**eelers
- to relate to the outside world?
  - **J**udgers
  - **P**erceivers

Apply a mix of communication styles

	Communication strengths	Potential problems
S-types	○ visual and audio info ○ concrete information ○ details; real experiences ○ realistic; grounded	○ dry or flat ○ random details ○ lack meaning
N-types	○ inspirational ○ stories; visionaries ○ big picture & patterns ○ significance; analogies	○ vague ○ ambiguous ○ not concrete

Communicate to inform and inspire your audience!

Part 2: Some Practical Suggestions

How do you start?

- What core messages need to "stick"?
  - prioritize your messages

- Don't just try to compress a longer talk
- Don't just "get through the material"

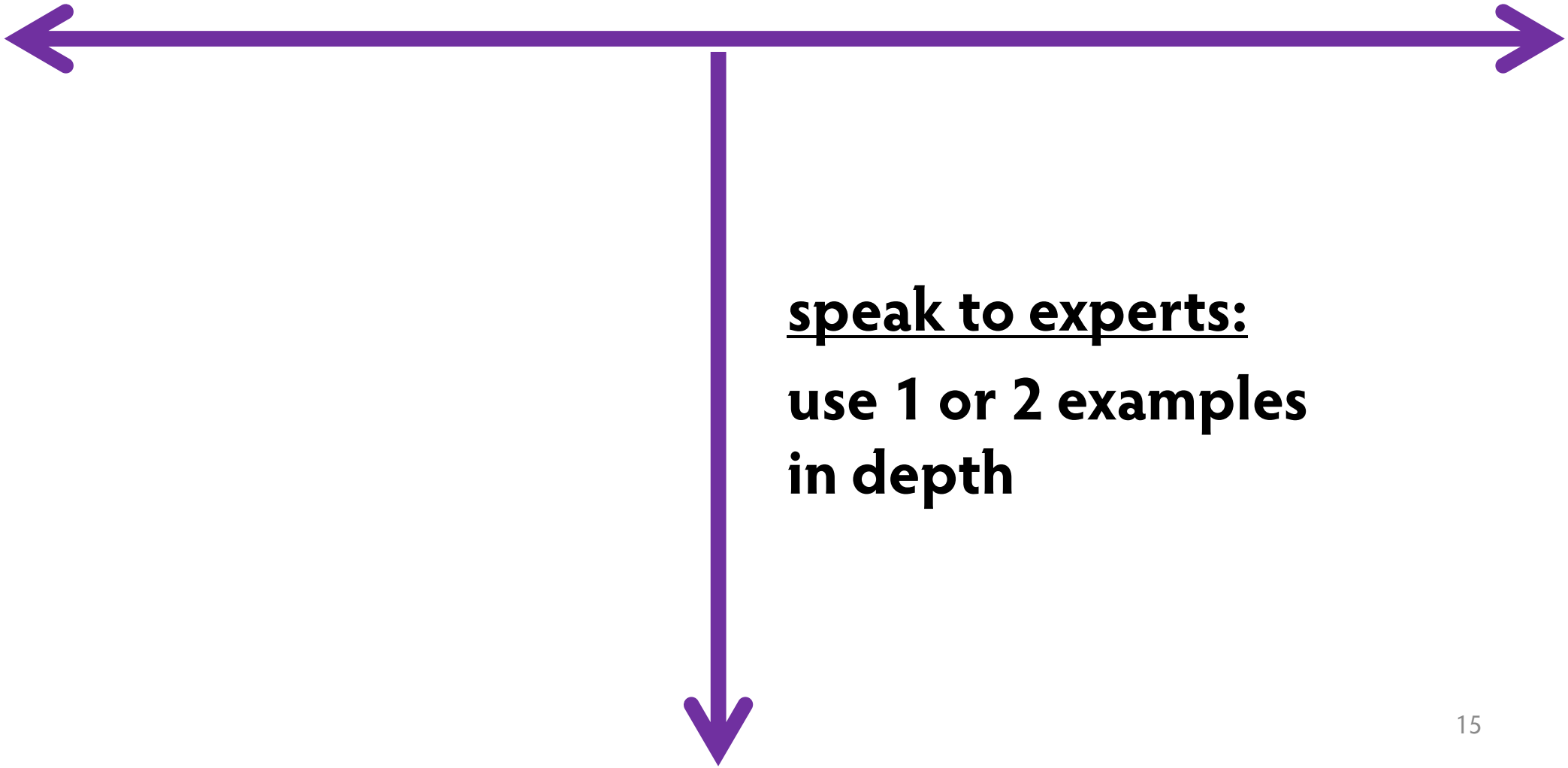
Craft a scientific story

- **the classic elements of a story are:**
  - thesis – intro characters, context, significance
  - antithesis – problem or question
  - synthesis – wrap up and conclusions

- **set your story with clear rhetorical markers**
  - context and significance
  - complication
  - question or problem
  - hypothesis or proposal

One challenge is to go broad *and* deep

speak to broad audiences: use analogies and illustrations



speak to experts:

use 1 or 2 examples in depth

Creating Slides

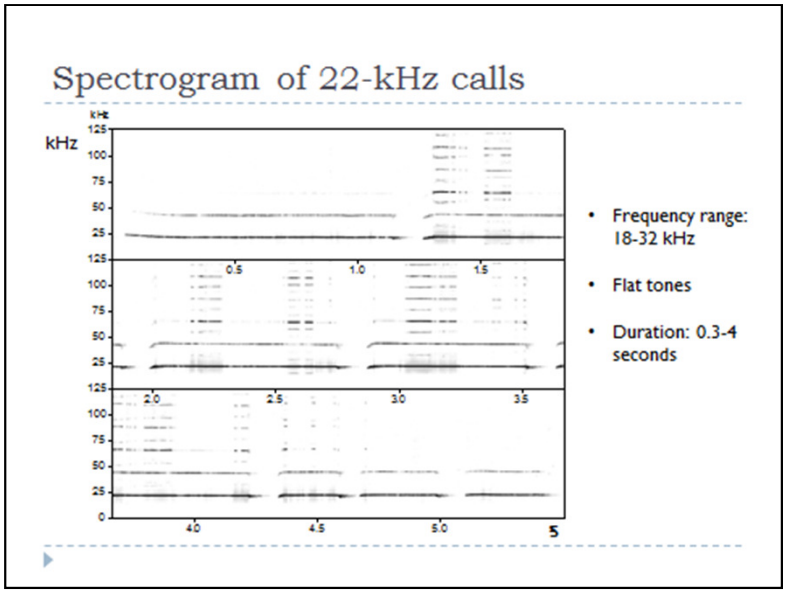
- **Plan to spend 1-2 minutes per slide**
  - 10 min talk: 6-9 slides
  - 30 min talk: 15-20 slides
  - etc

- **Maximize the "info to ink ratio"**

$$\frac{\textbf{info}}{\textbf{ink}}$$

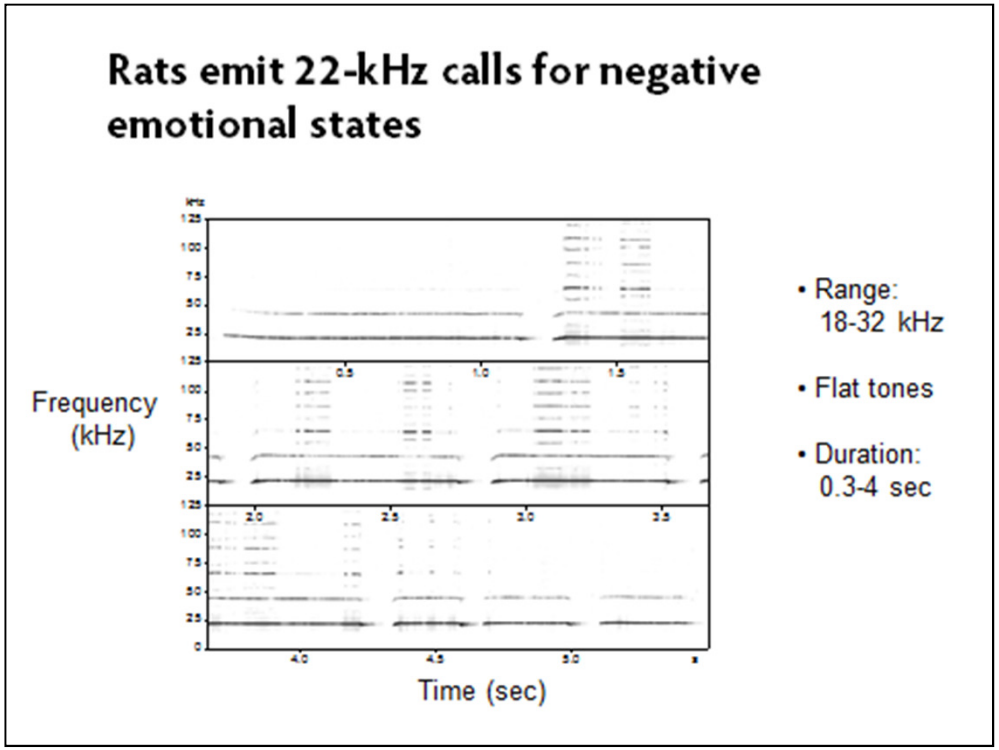
Use "message" titles

"Topic" titles only give the topic of the slide.

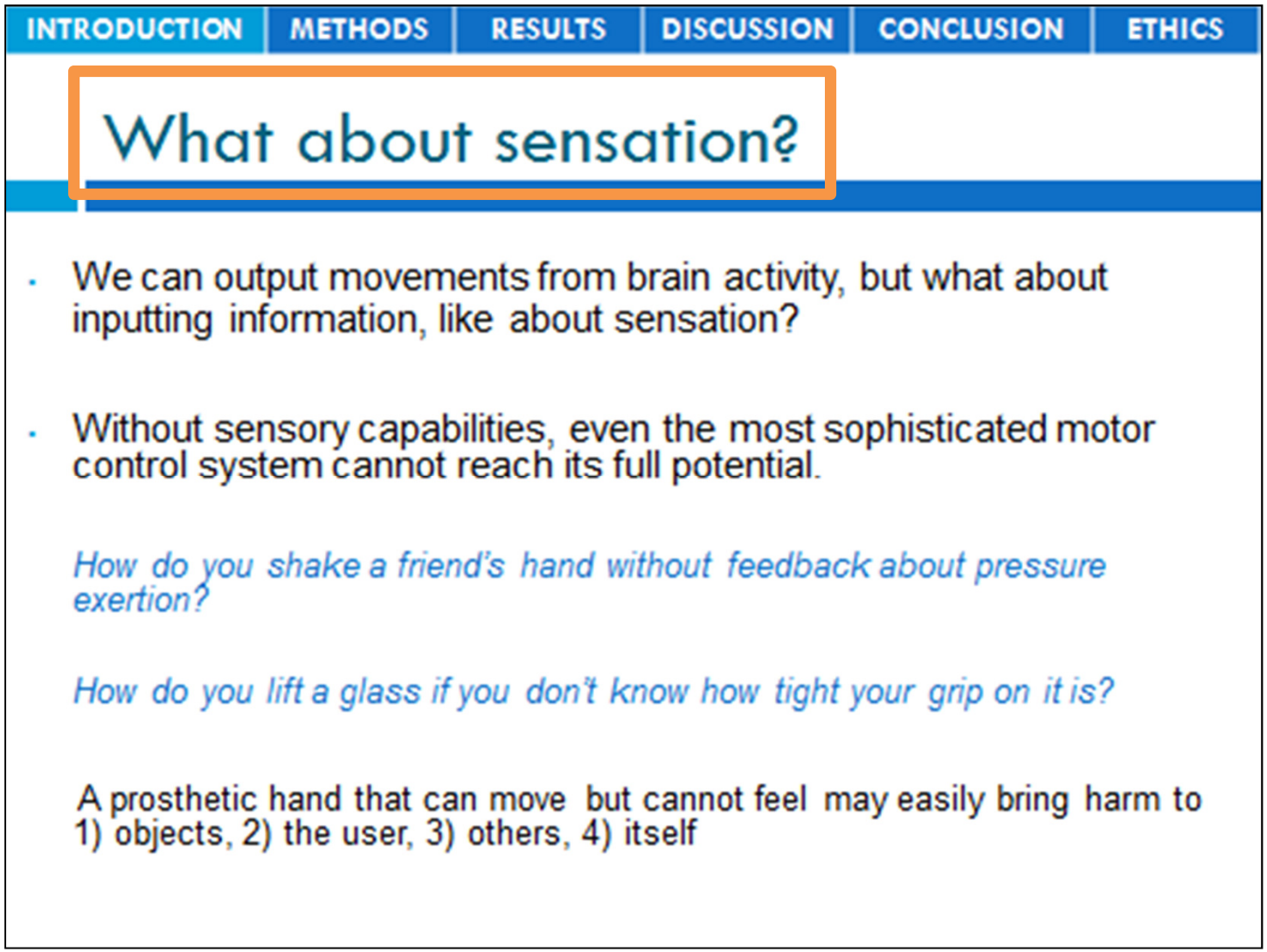


"Message" titles deliver your whole message.

Studies show more people remember content in message titles.



Or use "question" titles



Also, good use of outline

Convert bullet lists into word tables

(if possible)

bullet lists

#1: How do you prefer to relate to people?

- Extroverts:
  - gain energy by interacting with many other people
  - are sociable and outgoing
  - generally have multiple friendships
  - talk easily about themselves; are expressive
  - think out loud
  - generally prefer to initiate
- When working with an extrovert:
  - be social and respond to their expressiveness
  - give them feedback – verbal and nonverbal
  - allow them to think out loud; be a sounding board
  - talk with them in person
- Under stress, extroverts:
  - react with increased activity
  - can be impatient during lengthy, solitary activities

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word tables

#1: How do you prefer to relate to people?

Extroverts:	• gain energy by interacting with many other people • are sociable and outgoing • generally have multiple friendships • talk easily about themselves; are expressive • think out loud • generally prefer to initiate
When working with an extrovert:	• be social and respond to their expressiveness • give them feedback – verbal and nonverbal • allow them to think out loud; be a sounding board • talk with them in person
Under stress, extroverts:	• react with increased activity • can be impatient during lengthy, solitary activities

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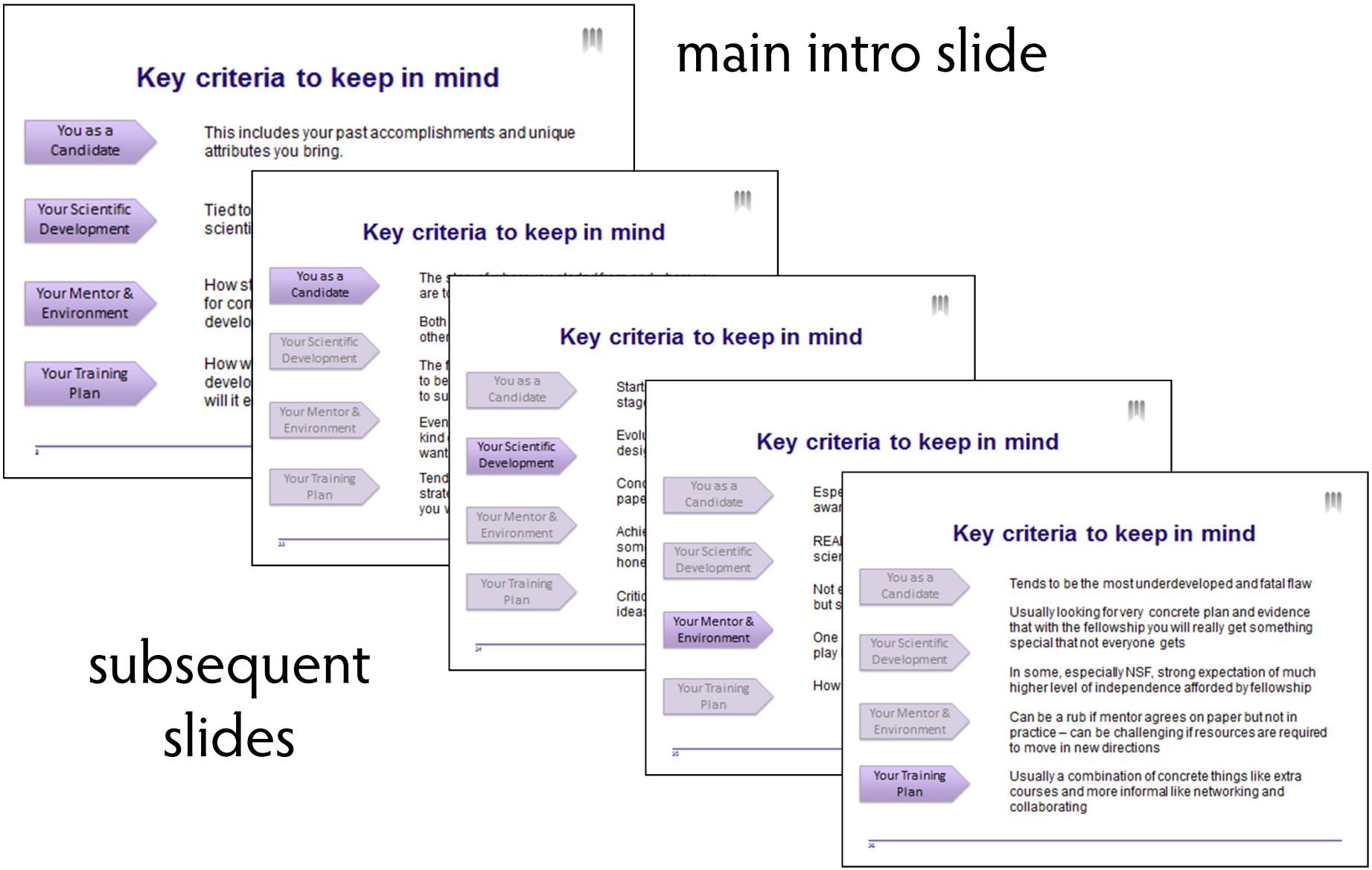
better use of space with larger fonts

Here's a good example of word tables

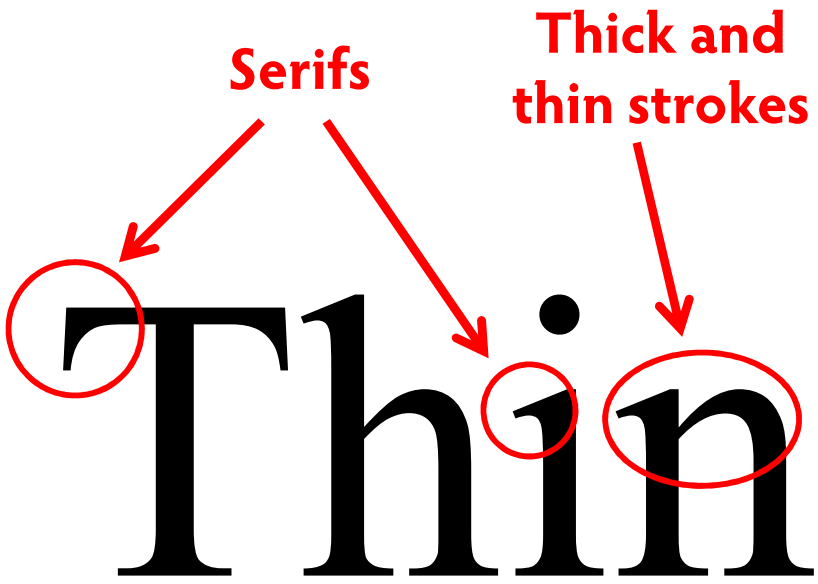


main intro slide

subsequent slides

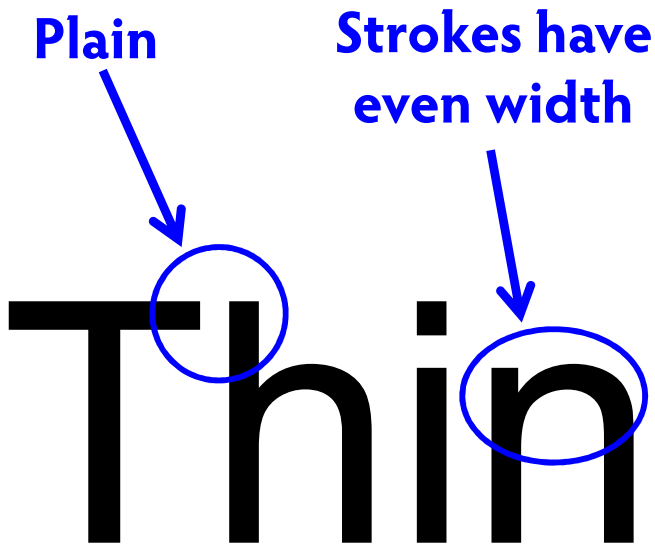
Only use sans serif fonts

Serif Font



Times New Roman

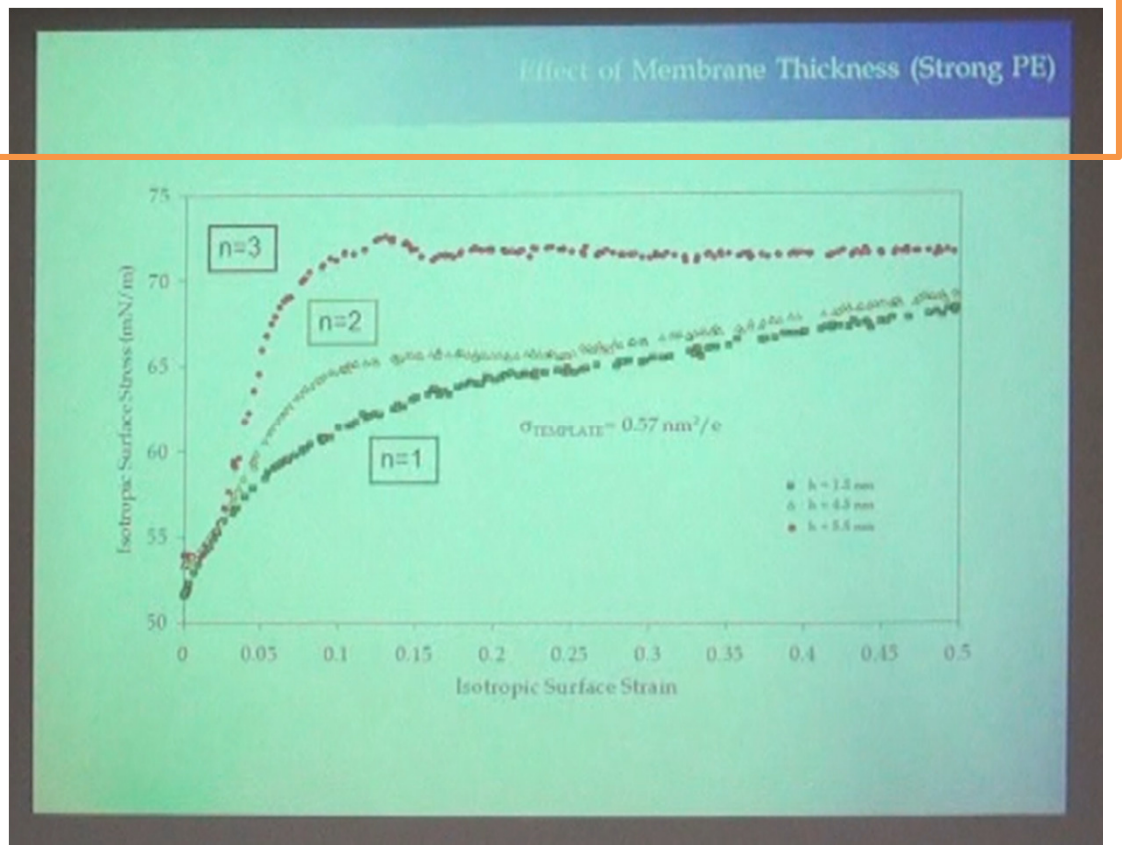
Sans Serif Font



Arial

easier to read

Avoid using color gradients



tough to read

What you see on your monitor is <u>not</u> what the audience sees on the screen.

Additional tips for creating slides

- **Organize experiments for clear communication**
  - trials done in lab
    - trial A; trial B; trial C; trial D – last trial works
  - during a presentation
    - chronological order: A, B, C, D
    - better order: D and then A, B, C (briefly)
  - don't drag the audience through useless information

- **To minimize slides, place extra content on slides or handouts for afterwards.**

Suggestions for delivering your talk

- **If you get nervous, try memorizing your introduction.** (more tips on handout)
- **Eye contact helps to relate with your audience.**
- **Connect your spoken words with the slides.**
- **Your physical posture …**
  - affects the audience's *perception* of you
  - and your *performance* as well
- **Practice and get feedback – early and often**

Make your poster "skimmable"

Analysis of Parenchymal Texture Properties in Breast Tomosynthesis Images

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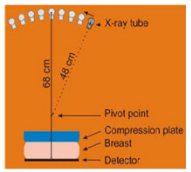
Purpose

We are studying parenchymal texture in Digital Breast Tomosynthesis (DBT) as a measure of Cancer Risk. We compare to standard Mammography[1].

Long-term goal: Test the hypothesis that DBT can provide more accurate measures of Cancer Risk.

Digital Breast Tomosynthesis (DBT)

A novel 3D x-ray imaging technique in which 3D tomographic images of the breast are reconstructed from multiple 2D x-ray source projection images[2].



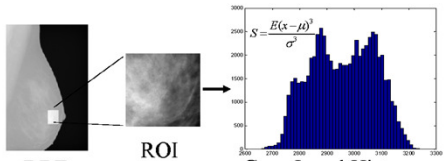
DBT geometry

DBT advantage over projection Mammography:

- Superior normal tissue and lesion visualization
- Superimposition of non-adjacent tissue is avoided

Methods: Texture Analysis

We computed the skewness S of the gray-level histogram for 256x256 retroareoral ROIs[2] in the Source Projection images acquired from 9 women.

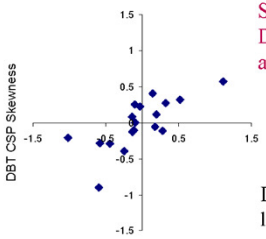


DBT ROI Gray-Level Histogram

Results: DBT comparison to Mammograms

We compared skewness from DBT Central Source Projections (CSP) and corresponding Mammograms.

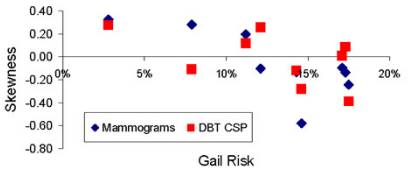
DBT ROI Mammogram ROI



Skewness values from DBT and Mammograms are correlated (ρ=0.74).

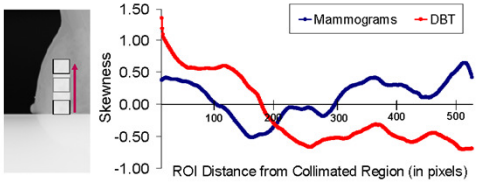
DBT ROIs appear to be less skewed (p=0.09).

DBT skewness follows similar trends as in Mammograms when plotted versus the Gail breast cancer risk values for the contralateral breasts.



Results: Effect of Scatter in DBT

At acute angles, our DBT geometry is such that the x-ray collimator is visualized[3]. We selected an ROI near the collimator and translated its position over 512 pixels.



The skewness is greater for DBT images near the collimated region due to the spatial dependence of the scatter near the boundary of the x-ray field.

Conclusions

Texture in DBT differs from Mammograms. This can be attributed to differences in image acquisition:

- Scatter effect
- Less compression force
- Lower radiation dose

We are investigating the potential of DBT to provide Cancer Risk biomarkers for tailoring individual treatment and forming preventive strategies.

Acknowledgement

This work was funded by the Agfa/RSNA Research Fellowship in Basic Radiologic Sciences FBRS0601.

References

1.Li H, et al, Academic Radiology 2005; 12:863-873
2. Niklason LT, et al., Radiology 1997; 205:399-406
3. Carton AK, et al, Physics of Medical Imaging SPIE 2006

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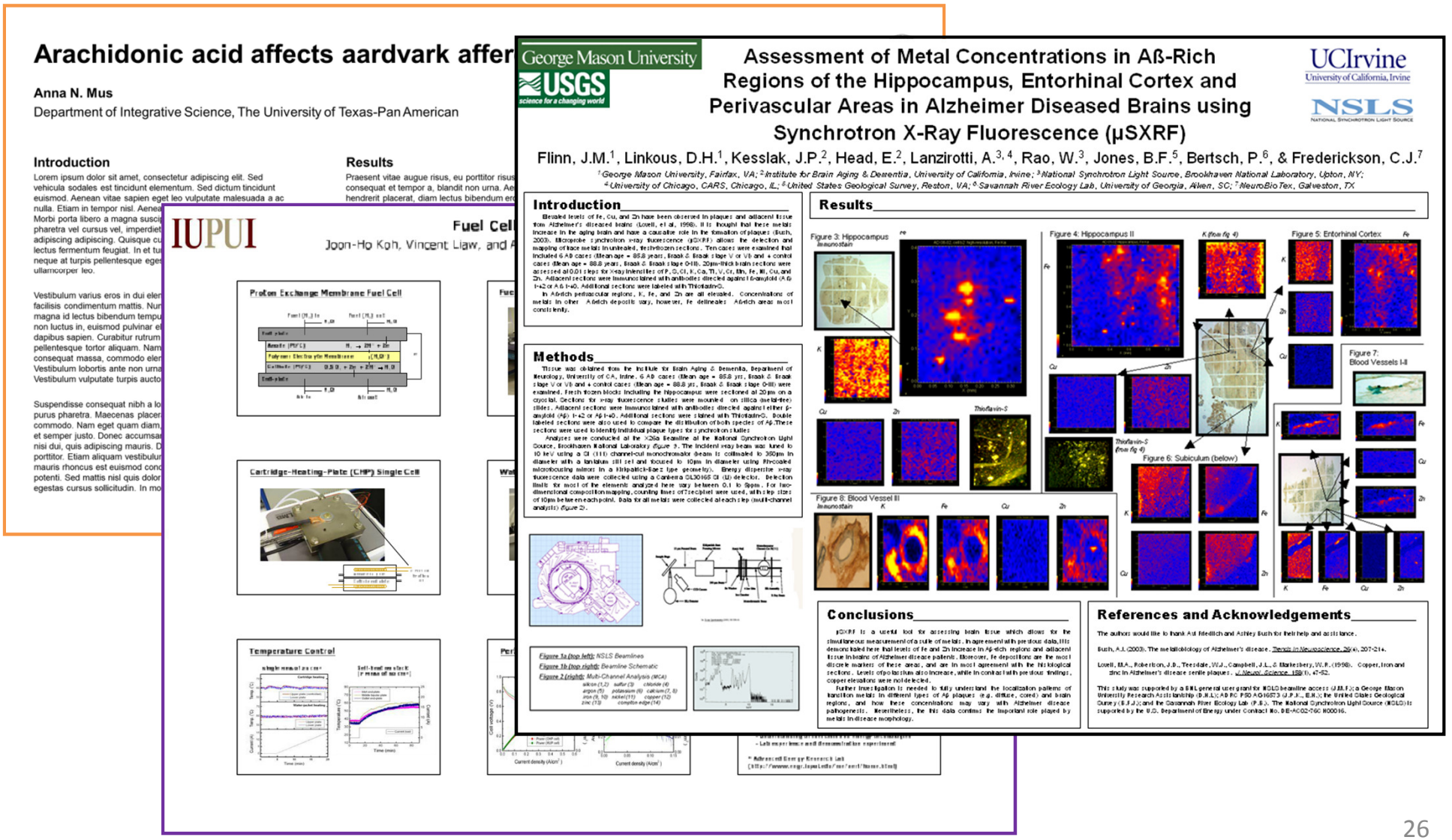
Avoid lazy conversions of papers or slides into a poster, or a "data dump"



More tips for posters

- **Engage your listener**
  - Ask about their research and interests
- **Viewers won't read paragraphs of text**
  - summarize in word tables or bullet lists
- **Annotate data with your main message**
  - explain the significance of the data
- **Take advantage of your medium**
  - **Give the big, "skimmable" picture**

Resources

- **Chip and Dan Heath's**
  Made to Stick

- *Making Oral Presentations: Dealing with Nervousness* (handout)

- Amy Cuddy's Poptech talk
  - Power Poses

Transform your ideas to