How to Present Your Data

Professional Development Webinar September 22, 2016

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Outline

CONTENT
• Goals
• Framework
• Common Pitfalls

FORMAT
• Font & Typeface
• Color
• Tables
• Optimize Graphics
• Tips for Oral Presentation
• Tips for Poster
Features of Good Presentation

• Engages the audience
• Simple delivery: “less is more”
• Has a central message
• Logical Flow
• Capitalize on images
The Challenge
Keep Earning your Audience’s Attention

Bunce et al. Journal Chemical Education 2014
Presentation ≠ Dumping Data
Presentation = Communication
Test for Central Message
Enhance Central Message

Central Message: “Need to Know”

Supportive Data (Must Keep)

Non-Essential Data (OK to Omit)

Background: “Nice to Know”

Data that disputes (also keep)
Ideal Framework

TITLE

CENTRAL MESSAGE

BACKGROUND INTRODUCTION OBJECTIVES

METHODOLOGY

RESULTS

CONCLUSION DISCUSSION
Poor Presentation

TITLE

BACKGROUND INTRODUCTION OBJECTIVES

METHODOLOGY

RESULTS

CONCLUSION DISCUSSION

CENTRAL MESSAGE?
Title: Spend time on it

• Influences reviewers & graders
• Selects audience
• Predisposes audience
• Disseminated by search engines
• Some people only read title!
Which Title Do You Prefer?

A. Impact of a stroke trial network on recruiting rates: a before and after study

B. Is a stroke trial network associated with improved recruitment rates?

C. A stroke trial network improves recruitment rates
Title Types

A. Impact of a stroke trial network on recruiting rates: a before and after study
   - DESCRIPTIVE

B. Is a stroke trial network associated with improved recruitment rates?
   - QUESTION TYPE

C. A stroke trial network improves recruitment rates
   - DECLARATIVE
Choosing Right Title

• Short and Catchy
• Descriptive type = boring (unless novel methods or RCT)
• Question type = too much suspense!
• Declarative type= best (get to the point)

http://static.guim.co.uk/sys-images/Film/Pix/pictures/2013/2/8/1360326092958/Alfred-Hitchcock-010.jpg
# Title Types & Impact

<table>
<thead>
<tr>
<th>Title Type</th>
<th>Median Downloads</th>
<th>Median Citations</th>
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</thead>
<tbody>
<tr>
<td>Descriptive</td>
<td>2,754</td>
<td>14.2</td>
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<tr>
<td>Declarative</td>
<td>2,565</td>
<td>12</td>
</tr>
<tr>
<td>Question</td>
<td>3,723</td>
<td>6</td>
</tr>
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</table>

Jamali et al. Scientometrics 2011
Background Section

What is this about? Why should I care? What was the question?

Issue
Significance
Hypothesis
Background: Pitfalls

- Too long
- Too much history
- Fails to convey relevance
- Stalls interest
Methodology

What type of study? Was it adequate? Was it done right?

Study Type Match for Question Rigorous approach
Pitfall: First Sentence

CONCEALED METHODS

• We identified all the patients diagnosed with Moya-Moya in our prevention clinic from 1996-2013 and compared it with patients seen in that same period...

DECLARATIVE

• This was a case-control study.
Predispose Audience

Controls?  
Selection Bias?  
Recall Bias?

This was a case-control study..
Pitfall: Contamination with Results

**BAD**
- We analyzed 1254 consecutive patients admitted to our stroke service...

**BETTER**
- We analyzed consecutive patients admitted to our stroke service...
- Results: 1254 patients were analyzed
Results

Graphics please!
Chronologically
No interpretation

This is what I found
This was the order
Objective
Results: Pitfalls

- Interpretation ("significant")
- Ineffective Graphics
- "I know this is a busy slide."
- Redundancy text-graphic
Conclusion

What do you make of this? How does it fit with previous knowledge?

This is my interpretation of each finding in context.
Conclusion: Flow
Conclusion: Pitfalls

- Too little interpretation
- Does not interpret the results in context
- Introducing new results
- Disorganized flow
- Ending with “more research is needed...”
Which is Easier to Read?

<table>
<thead>
<tr>
<th>TEXT 1</th>
<th>TEXT 2</th>
<th>TEXT 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE STROKE TRIALS NETWORK (NIH STROKNET) IS DESIGNED TO MAXIMIZE EFFICIENCIES TO PRIORITIZE, HARMONIZE AND STREAMLINE THE DEVELOPMENT OF HIGH-QUALITY, MULTI-SITE CLINICAL TRIALS FOCUSED ON KEY INTERVENTIONS IN STROKE PREVENTION, TREATMENT, AND RECOVERY. EARLY PHASE 1-2 EXPLORATORY AND CONFIRMATORY PHASE 3 TRIALS AS WELL AS BIOMARKER-VALIDATION STUDIES THAT ARE IMMEDIATELY PREPARATORY TO TRIALS WILL BE COORDINATED THROUGH REGIONAL COORDINATING STROKE CENTERS, THE NATIONAL CLINICAL COORDINATING CENTER, AND THE NATIONAL DATA MANAGEMENT CENTER.</td>
<td>The Stroke Trials Network (NIH StrokeNet) is designed to maximize efficiencies to prioritize, harmonize and streamline the development of high-quality, multi-site clinical trials focused on key interventions in stroke prevention, treatment, and recovery. Early phase 1-2 exploratory and confirmatory phase 3 clinical trials as well as biomarker-validation studies that are immediately preparatory to trials will be coordinated through Regional Coordinating Stroke Centers, the National Clinical Coordinating Center, and the National Data Management Center.</td>
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</tr>
</tbody>
</table>
Fonts & Typeface

• ALL CAPITALS DECREASE SPEED BY 14%
• *Italics difficult to read*
• Use ≥22 point font for text
• Uppercase with bullets

*Durso et al Laws&Rules 2011*
Typeface Choices

**SERIF**
- Times New Roman
- Georgia
- Cambria
- Constantia

- Faster to read: Best text

**SANS-SERIF**
- Arial
- Calibri
- Tahoma
- Verdana
- Century Gothic

- Slower to read: Best headlines

Paterson and Tinker, J Appl Psych 1932
Background/Design

- Brightness crucial in the search speed
- High contrast text-to-background
- Dark text, light background better
- Yellow text, blue background optional
- Avoid red/green (8% of men deficiency)

Courtesy of Michael Wall MD
Use of Color

• Color has to code a message
• Color is superior to brightness, shape, underlining and other forms of coding
• Use to help visualize different variables
• Too many colors slows visual search

Smith 1967
Tables

- Sentence best for showing 2 values
- Tables best for small data sets
- Allows comparisons
- Gives exact values
- Usually better than a pie chart

Tufte ER. The Visual Display of Quantitative Information
Pie Chart Not Precise

PRE-MONITORING
- Atherothrombotic: 29
- Cardioembolism: 27
- Lacunar: 25
- Other: 21

POST-MONITORING
- Atherothrombotic: 25
- Cardioembolism: 31
- Lacunar: 22
- Other: 18
# Tables More Accurate

<table>
<thead>
<tr>
<th>SUBTYPE</th>
<th>PRE-MONITORING</th>
<th>POST-MONITORING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherothrombotic</td>
<td>28%</td>
<td>26%</td>
</tr>
<tr>
<td>Cardioembolic</td>
<td>26%</td>
<td>32%</td>
</tr>
<tr>
<td>Lacunar</td>
<td>25%</td>
<td>23%</td>
</tr>
<tr>
<td>Other</td>
<td>21%</td>
<td>19%</td>
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</tbody>
</table>
Features of Good Graphics

- Communicates complex data with clarity
- Encourages comparisons of data
- Keeps focus on substance
- Are efficient: short time & little ink
- Integrity: tells the truth

Tufte ER. The visual Display of Quantitative Information
Features Good Graphics (2)

- Data/Text integration
- Respect scale
- Eye friendly
- Horizontal trend

Tufte ER. The visual Display of Quantitative Information
Graphic Integrity

http://lawinthereelworld.wordpress.com/2013/04/18/justice-served-in-the-legal-comedy/
Integrity: Lack of Context

A

Pre-Intervention

P<0.01

Post-Intervention

2012

2013

Mortality 30 days

B

2008 2009 2010 2011 2012 2013

Pre-Intervention

Post-Intervention

Mortality 30 days
Integrity: Respect Discrete Data

A

B

Mean NIHSS Score

Mean NIHSS Score

Baseline  post rtPA  6h  12h  24h

Baseline  post rtPA  6h  12h  24h

NO

YES
Integrity: Limit Graphic to Data

A

B

NO

YES
Integrity: Adjusted Scale

Control

Intervention
Oral Platform

• Localized in space and time
• You have an audience
• Control sequence and rhythm
• Expect some level of interaction
Oral Platform: Delivery

- Practice, practice
- Engage Audience
- Make eye contact
- Speak clear & calm
- Convey enthusiasm
- Rhythm: 1 min/slide
Oral Platform: Format

• Few words
• Text supports speech
• Bullet statements
• Six bullets/slide
• Seven words per line
• No special effects!
Oral Presentation: don’t

• Read the slides
• Play with laser pointer
• Take a beta-blocker
• Loose your calm during questions

http://s3-ec.buzzfed.com/static/2014-05/enhanced/webdr06/27/11/enhanced-buzz-18743-1401206015-60.jpg
Tips for Posters

• Highly localized in space, spread in time
• You have to capture your audience
• Few seconds opportunity
• Control the sequence but no rhythm
• Most people don’t interact
Eye Tracking in Posters

<table>
<thead>
<tr>
<th>Proportion Time Fixating</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Title</td>
<td>4.2</td>
</tr>
<tr>
<td>Introduction</td>
<td>24.3</td>
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<tr>
<td>Methods</td>
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<tr>
<td>Figures</td>
<td>8.9</td>
</tr>
<tr>
<td>Results</td>
<td>19.9</td>
</tr>
<tr>
<td>Conclusions</td>
<td>23.2</td>
</tr>
</tbody>
</table>

Foulsham T & Kingstone, Perception 2011
Effective posters

- Visually Appealing: Get attention
- Focused: Only “need to know” text
- Bullets and LARGE FONTS
- Use plenty of white space
- 50% Graphics/pictures
- Follow meeting guidelines
Don’t in Posters

- Use logos with title
- Distracting arrangements
- Too busy
- Too little graphics
- Poster guard & stare
Summary

• Be relaxed and enthusiastic
• Have a clear central message
• Work on a good title
• Use a balanced framework
• Optimize color/text
• Plenty of excellent graphics
Questions?

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