Human Error, GenderMag & How to Give a Talk (next week)

Stephen Gilbert & Amanda Newendorp

HCI
Session 3
Human Error

Some slides from Sarah Wiseman, Sandy Gould | University College London
Proportion of system failures based on human error

- 90% Air traffic control
- 85% Cars
- 70% US nuclear power plants
- 65% Jet cargo transport
- 31% Petrochemical plants
- 19% Petroleum industry

Instead of on:
- Bad design
- Maintenance issues
- Management issues
Error: intention is key
Probabilistic Risk Assessment

\[ R = P_E \times \sum_{i} (P_i | E \times C_i) \]

\[ P(\text{consequence}) = P(\text{opportunity}) \times \]

\[ P(\text{error given opportunity}) \times \]

\[ P(\text{no correction in time given error}) \]

Related to Failure Modes and Effects Analysis (FMEA)
Challenges with probabilistic approach

Getting the probabilities for human perceiving, responding, deciding, etc.

Estimating probabilities of rare or unexpected events.

It assumes many events are independent, but they’re not.

Resilience Engineering
Communication Failure Modes

- **Info Perceived**
  - Info Trusted
  - Info useful
  - Opportunity to use
  - Action Taken

- **Info Missed**
  - Info Rejected
  - Info not useful
  - No opportunity
  - No action

Types of Errors

Human Error

Slips
Right plan. Wrong execution.

Mistakes
Wrong plan. Right execution.

I should take my umbrella tomorrow. (Doh! I forgot!)

The grocery is right next to the gas station. I’ll do shopping first.
Post-Completion Errors

Forgetting the final subgoal of a task because primary goal is reached.


Design Implications

Remove possibility for post-completion errors.
If not feasible...

Provide very strong cues:
  Explicit
  Timely
  Visually salient
Design Implications 2: Resilience

Aid recovery
Make actions reversible
Make results of each action noticeable within 150 ms.

Bonnie John on Cancel
http://www.youtube.com/watch?v=gxiA4JTS9P8&t=0m26s
Examples: Name that error

Pizza complaint
http://youtu.be/pkAeNcNJVjA

Chaos buttons, human error and healthcare

Morning 1
http://www.youtube.com/watch?v=ifjDWKMNIlk&t=1m54s

Morning 2
http://www.youtube.com/watch?v=ifjDWKMNIlk&t=3m12s

Dominic Furniss
University College London
Individual Differences

States and traits that make people perceive or perform differently.
GenderMag: Could software be sexist?

Dr. Margaret Burnett
GenderMag.org
https://youtu.be/txp4Cl3JGbc
GenderMag Method

What happens if most of the programmers, designers, and managers are men, but half of the users are women?

Can we make more inclusive software without relying on stereotypes?
Bad “inclusive” design
Good inclusive design

Redesigned backpack to fit women better

Can we do the same thing in HCI?

The Women-Specific FlexVent™ Suspension System, Certified By The American Chiropractic Association, Has Articulated Shoulder Straps, A Rounded Back Panel, Comfortable Stitch Lines And Soft-Touch Chemise Fabric
GenderMag cognitive facets

1. Risk aversion
2. Motivations
3. Computer self-efficacy
4. Information processing style
5. Learning by tinkering vs. process

Gender-based **trends** for how these facets manifest
Personas to represent facets

Tim (Timothy/Timara)

Abi (Abigail/Abishek)

Pat (Patrick/Patricia)
Abi persona

1. Risk-aversion: high
2. Motivation: uses technology to accomplish the task
3. Information processing style: comprehensive
4. Computer self-efficacy: low
5. Tinkering: avoids it

Abi (Abigail/Abishek)
GenderMag Method

1. Pick a persona, e.g., Abi

Abi (Abigail/Abishek)
GenderMag Method

2. Give her a goal

“Use the new EcoHome app to change your thermostat setting to 75°F”
GenderMag Method

3. Ask developer for subgoal: “What were you hoping Abi would want to do first?”

*Abi should go to the page to adjust the temperature.*

Will Abi have that subgoal? (yes, no, maybe)
GenderMag Method

4. Assume Abi has that subgoal. Ask developer what action Abi should take?

*Abi should touch the circle that says 78°F to go to the temperature page.*

Will Abi take that action? (yes, no, maybe)
GenderMag Method

5. If Abi takes the action, will Abi see progress to subgoal? *(yes, no, maybe)*

*If Abi touches the circle that says $78^\circ F$, will she know that she’s in the right place to adjust the temperature?*
InclusiveMag and beyond

Same method can be applied to other individual differences

• SocioeconomicMag
• SeniorMag
• ChildrenMag
• ADHDMag
GenderMag

Questions?
How to Give a Talk
You’ll be giving a talk…

Video presentation, Demo for app

Group project presentation

In Week 9 to a CUNY REU site:
- You talk to them.
- You listen to them.
Doesn’t talking come naturally?

No.

It can be scary.

It can be boring, even soporific.
Doesn’t talking come naturally?

No.

It can be scary.

It can be boring, even soporific.
What are you trying to tell to your audience?

You’re a passionate analytical authority.

Oh, and by the way…

Your message.
Messages

Please have 1-3 messages to convey. Each could be said in 30 seconds.

Facebook Participation Increases Isolation Within Rural Communities.

Our method of usability testing using bluetooth is better than existing methods.
Non-Useful Messages

I’m running out of time.

I’m sorry…

I did this, and this, and this, and that.
Typical Talk Outline

What’s the problem? (Hook!)
What have you done about it? (big picture)
How are you different than other people?
What did you do really? (details)
How did you solve the problem?
Sample outline with slide counts

Title/author/affiliation (1 slide)
Motivation and Problem Statement (1-2)
  Why should anyone care?
Outline of talk (1)
  Suggest you have an innovative solution
Related Work (0-1)
  Cover superficially or omit; what have others tried?
Methods / Results / Major Points (4-6)
  What did you do? What happened?
  Do not superficially cover all details; cover key points well. No big data.
Conclusion (1)
Backup Slides (0-3)
Don’t delay the message

Worse
First, there was the mouse.
Then other interfaces…
I’m working on the iPhone…
My contribution is…

Better
A problem to be solved is…
My contribution is…
Why does this matter?
First there was the mouse…
Tell a story with Signposting

- What’s the problem?
- What’s the goal of this talk?
- Where are we headed next?

  Background – How does this help me?

  Example 1
  Are we there yet?

  Example 2
  Are we there yet?

  Example 3
  Are we there yet? YES!

  Summary
  Implications, Next steps, Save the world

Thank you. Questions?
Tips

From Paul Edwards’ *How to Give an Academic Talk*

(Valid even though your talk isn't "academic")

<table>
<thead>
<tr>
<th>Usually Better</th>
<th>Usually Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talk</td>
<td>Read</td>
</tr>
<tr>
<td>Stand</td>
<td>Sit</td>
</tr>
<tr>
<td>Move</td>
<td>Stand still</td>
</tr>
<tr>
<td>Vary the pitch of your voice</td>
<td>Speak in a monotone</td>
</tr>
<tr>
<td>Speak loudly, facing the audience</td>
<td>Mumble, facing downward</td>
</tr>
<tr>
<td>Make eye contact</td>
<td>Stare at your laptop</td>
</tr>
<tr>
<td>Focus on main points</td>
<td>Get lost in details</td>
</tr>
<tr>
<td>Use outlines, images, and charts</td>
<td>Have no visual aids</td>
</tr>
<tr>
<td>Finish within your time limit</td>
<td>Run overtime</td>
</tr>
<tr>
<td>Rehearse</td>
<td>Don’t practice because you’re too busy working on the slides</td>
</tr>
<tr>
<td>Summarize your main points at the beginning and end</td>
<td>Start without an overview; trail off without a conclusion</td>
</tr>
<tr>
<td>Notice your audience and respond to its needs</td>
<td>Ignore audience behavior</td>
</tr>
<tr>
<td>Emulate excellent speakers</td>
<td>Emulate your advisor, even if s/he gives lousy talks</td>
</tr>
</tbody>
</table>
Tips for your Voice

Breathe right (from gut, not chest)

When you inhale, your stomach should push out.
puh! tuh! kuh!

Loud and deep

Silence

Repeat phrases

We're going to try it now!
Tips for your Body

Dancing (stand on a plastic bag)
Speed
Where to stand
Eye contact and engagement

Messages Conveyed

Verbal
Non-Verbal

Slide inspired by Leslie Potter
Learn from Great Speakers

TED Talks (ted.com)
Ignite talks (https://www.youtube.com/@ignite)

And from bad ones
Less is more
Conscious decision

Right now,
Should they look at me or the screen?

Do my words need any visual aid?
Last tips

Use a remote control.

Avoid giving a demo live.

Don’t look at the screen (your back’s to the audience).

Don’t read your slides.

Do look at someone.
Info for CUNY presentation
Outline

1. What problem are you addressing? Why is it important?
2. What have other people done, and how is your approach different?
3. What are you doing?
4. What have you learned so far?
5. What are the challenges you've experienced? What do you wish you knew?

Logistics

Each team has 9 min to talk and 8 min for Q&A.

Each person should speak about 3 min.

Zoom, probably with Owl.
When listening to CUNY

If you’re bored, take notes, but not on your phone.

Prepare a question. Every speaker should get at least 2 questions. Post your questions in the chat if you don’t get to speak them.