Reporting Results

Research Methods for Human-Centered Computing

Reporting Results

Today's goal:

Teach how to write a research paper

Outline:

- Feedback on proposal presentations
- Writing strategies
- Section by section
- Style points

Feedback

On your proposal presentations

Feedback

Presentations were very good!

- Engaging
- Clear
- Sufficient detail

Make sure your reasoning is clear

> Motivation plays a big role in HCC research

Feedback

Don’t be afraid to expand your study

Make sure to measure everything you want to know!

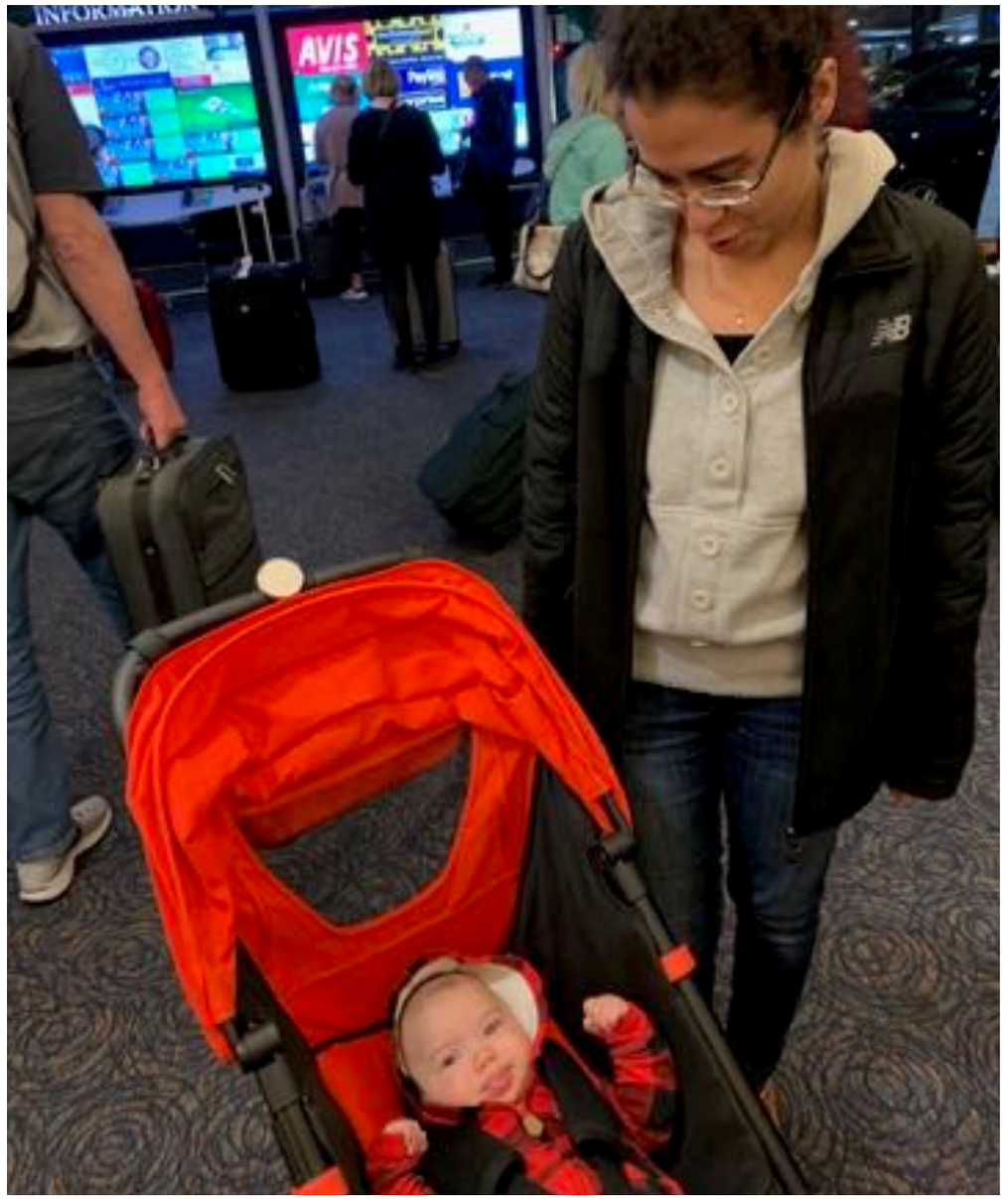
Beyond your main outcome, measure variables that explain your results

Feedback

Present your results as detailed as possible

Use graphs (even if they are fake)

Create a path model (useful to link all the manipulated and measured variables)



Feedback

Keep practicing your presentation!

- Find out what motivations resonate with others
- Get good at defending your methods
- Learn from the feedback

Writing strategies

How to write a paper

Writing strategies

Specificity hourglass:

- Broad intro
- Generic research questions
- Specific study hypotheses
- Study setup and results
- More generic discussion
- Broad conclusion

Writing strategies

Write your paper five times!

1. Outline
2. Key sentences
3. First draft
4. Understandable draft
5. Thorough edit
6. (usually additional edits)

Outline

Outline each section

- "Organize" the paper (enhance flow, prevent duplication)
- Using "keywords", what are the main points you need to address?
- Each of these keywords will become a paragraph
- Do this together

Key sentences

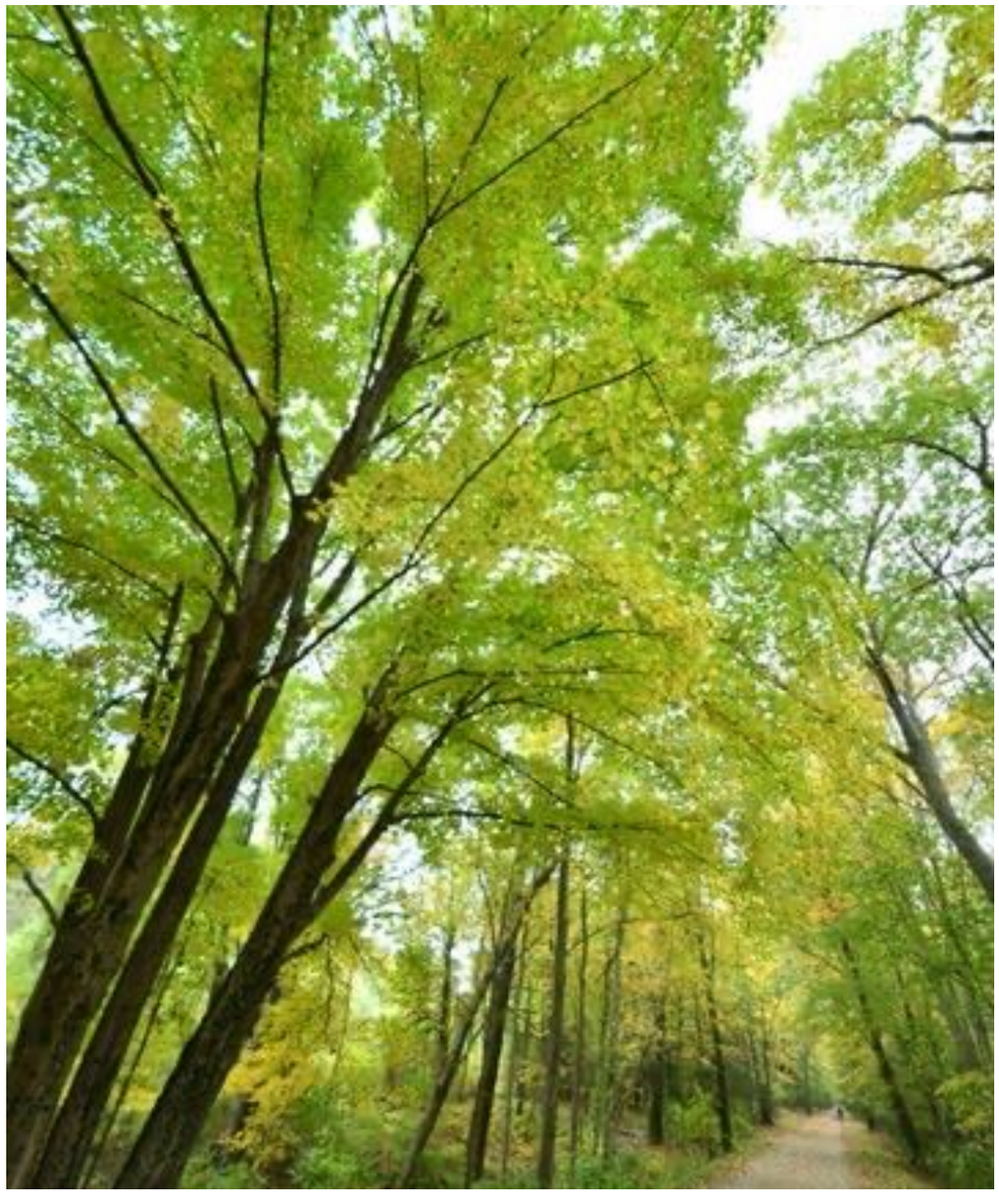
For each paragraph, write the key sentence

- The main takeaway of the paragraph
- The rest of the paragraph will be in service of this key sentence
- Write them carefully!
- Do this together

First draft

Write the paragraph around each key sentence

- Connecting sentences, clarifications, arguments, examples
- Must be in support of the key sentence!
- Key sentence is usually at the beginning or end
- You can do this in parallel



First draft

Academic paper writing:

Argument, argument, argument, therefore conclusion (key sentence)

Grant/industry writing:

Statement (key sentence) supporting argument, argument, argument

“Reader” edit

Re-write the paragraph, keeping the reader in mind; for each sentence:

Do they understand it?

Is it relevant (to the key sentence)?

Does it connect (are there gaps, is it out of order)?

Is it convincing?

You can do this in parallel

Thorough edit

Review and edit each other's sections, keeping in mind:

- Do I understand it?
- Do I find it relevant (to the key sentence)?
- Does it connect for me?
- Do I find it convincing?
- Best if done in the same room (so you can discuss)

Additional edits

Have an external reader review the paper

- Fellow students, advisor
- Give specific instructions

Flag points of contention

- Discuss them to find a solution
- If you can't agree: ask a third person

Paper sections

How to write each section of your paper

Paper sections

Title and abstract

Intro

Related work, hypotheses

Methods, results

Discussion, limitations and future work

Conclusion

Intro

Set the scene: Why is your work important?

- Some statistics
- Research questions (why these and not others?)
- How you plan to answer them
- Main takeaway/ contributions/signposting

Intro

At the end of the intro:

A reader must be able to know if they want to read the rest

A reviewer must be on board with your ideas

Don’t overclaim your scope, don’t underclaim either; keep it on topic

Hypotheses

Where do the hypotheses go? Several options:

- In the intro (below the research questions)
- In the related work (following from existing evidence)
- At the end of related work/beginning of methods (start of study)

Methods

Start with an overview of your study (what and why)

Subsections for:

- Participants (demographics and recruitment)
- System (importance/ detail depends on the study a bit)

Methods

Subsections for (continued):

- Procedure (step-by-step description of what the participant does in the study)
- Manipulations (independent variables)
- Measurements (dependent variables)

Methods

A good methods section makes the paper replicable

- If space is a concern, use the appendix, or create a technical report

"Defend" your methods by citing related work using the same methods

Results

Start with descriptives and manipulation checks

- Did your manipulation work?

Then main results

Then additional results (moderators etc.)

Refer back to the hypotheses

Results

Statistics: as text or tables

Effect sizes: graphs

- Especially for interaction effects!

Causal effects: path models

- Especially when you have multiple mediators

Put the findings in common terms, but don't extrapolate

Discussion

Start by reminding the reader about your overall goal (from intro)

Then a summary of the findings

- Did you accomplish your goal?
- Keep this short: a single paragraph is enough!

Discussion

Next, you reflect on each of your research questions

- Explain how your results answer the question
- How does this answer compare to findings from related work?

Put more emphasis on the surprising answers

- Try to explain them

Discussion

Now move to implications

- This is where you can extrapolate on the results
- What are the real-world implications?

Often these are “design implications”

- Managerial or research implications are also ok

Limitations

Limitations and future work

They are often combined

Sometimes part of the discussion

Discussing limitations can mitigate potential criticisms

External reviewers can help determine these

Limitations

General structure:

- Here is a limitation
- Here is why it is actually not a limitation (or at least not a huge limitation), OR
- Here is the trade-off behind it (why we couldn't resolve it), AND
- Here's how future work can resolve this limitation

Conclusion

Go back to your motivation (from the intro)

Why did you conduct this study?

Did you make any progress?

What is the main implication of your work?

I usually end on a “future outlook”

Title and abstract

Most important parts of the paper!

99% of the time, reviewers are selected based on title and abstract only!

Also what makes readers decide whether to download the paper

Title and abstract

Title usually gets decided on during the writing process

> For me, often during the “key sentences” part

The abstract is usually something I do at the end

> Or at least that’s when I iterate on it

Title

Research shows that papers with shorter titles have more citations*

CHI paper titles often have the format: “Catchy tagline: What we actually studied”

Don’t try to be punny

Abstract

Summary of the paper, usually 200 words or less

Structure:

- What is the problem/gap
- Your research question or conjecture regarding this problem/gap
- What did you do (type of study, methods!, etc.)

Abstract

Structure (continued):

What were your main findings (not all of them; usually only the most relevant ones)

What is your main implication (I tend to emphasize only the most important one)

Style points

Some notes on writing style

Language use

Keep it simple!

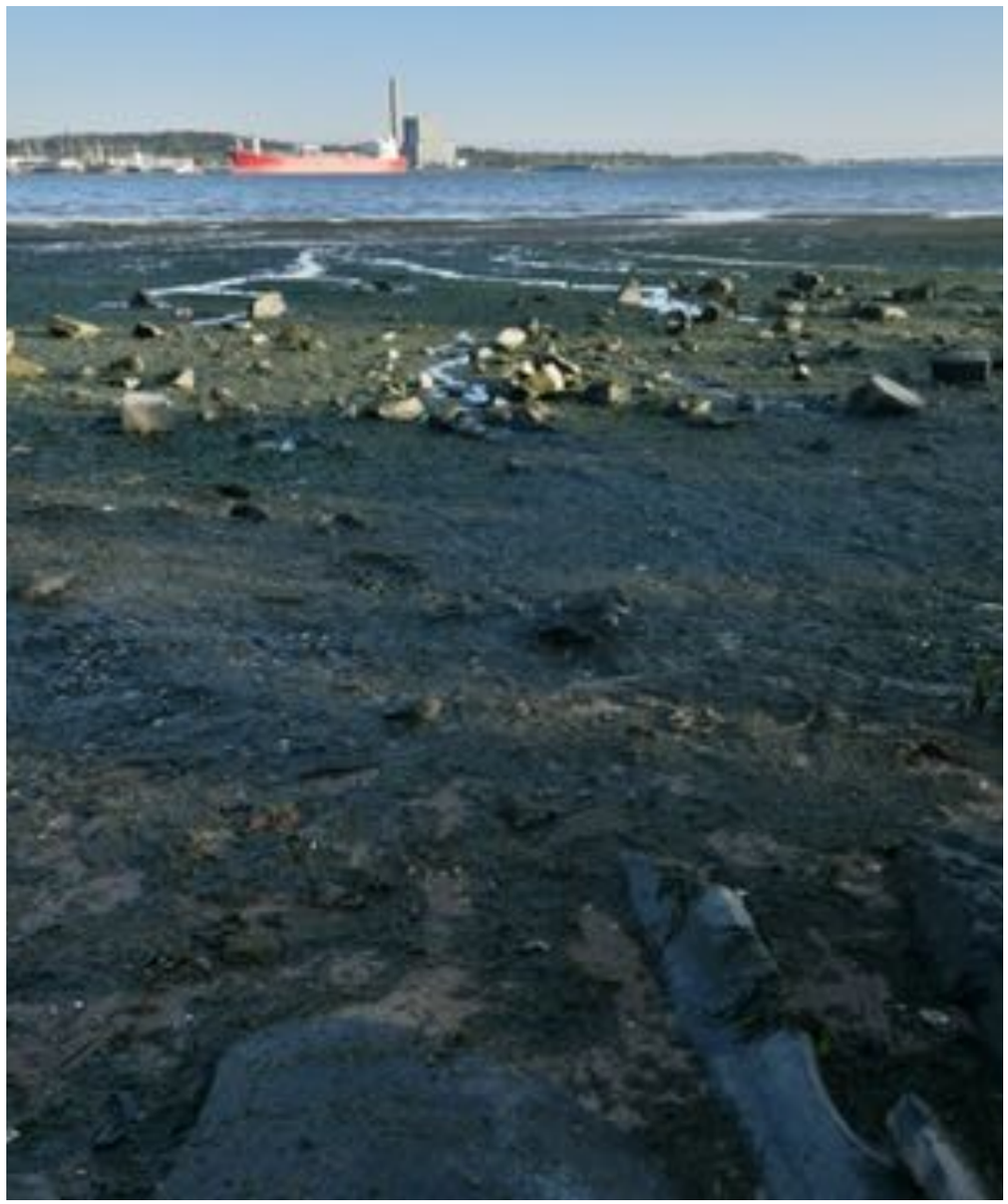
Straightforward writing is better than rhetorical flourish

Remove unnecessary words

E.g. in order to -> to

Avoid passive language

Active language tends to be more concise



Language use

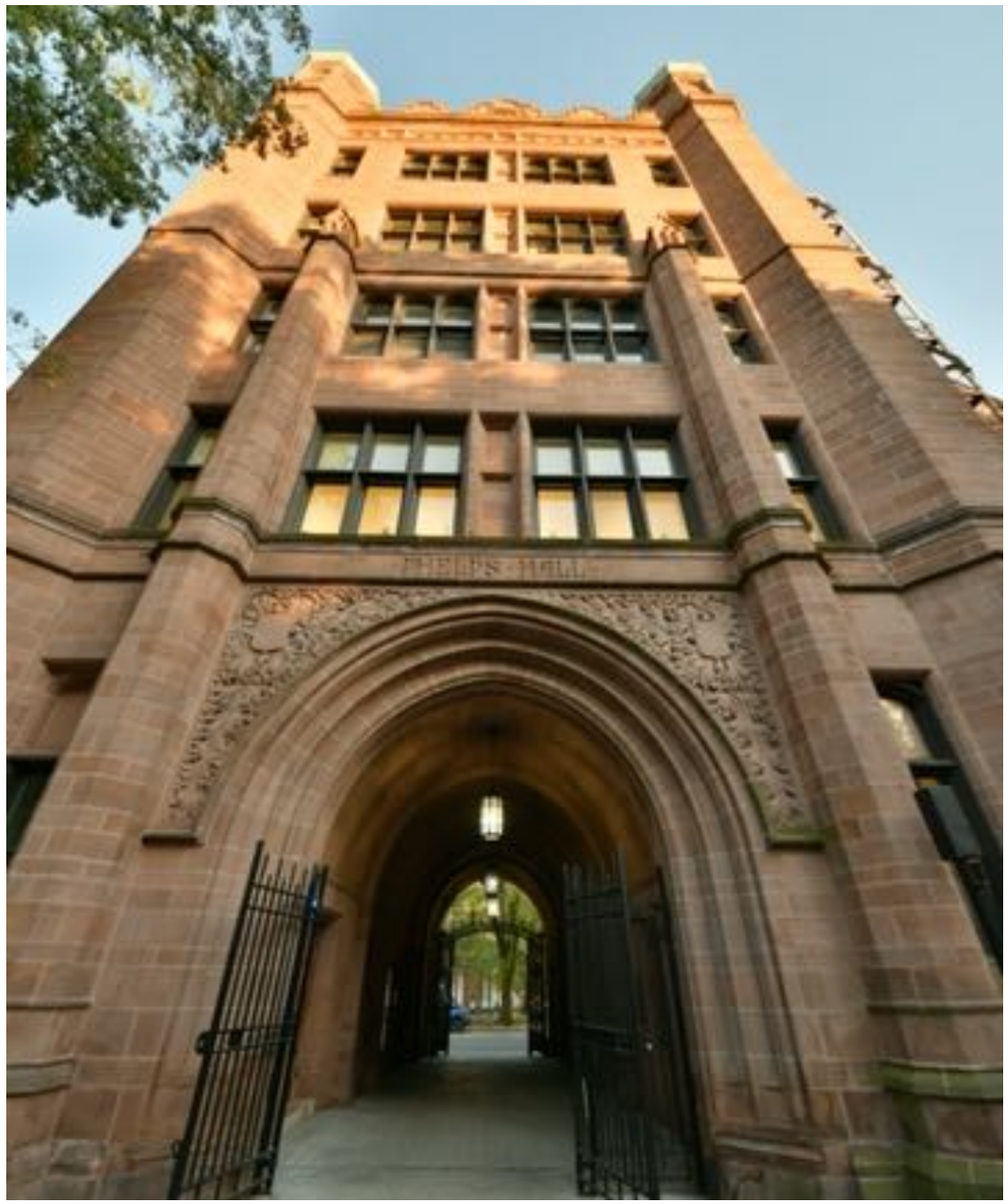
Avoid gendered language

> Most importantly, when writing about “the user” use “they/them” (or use the plural “users”)

~~Don’t~~ Do not use contractions!

Avoid colloquial language

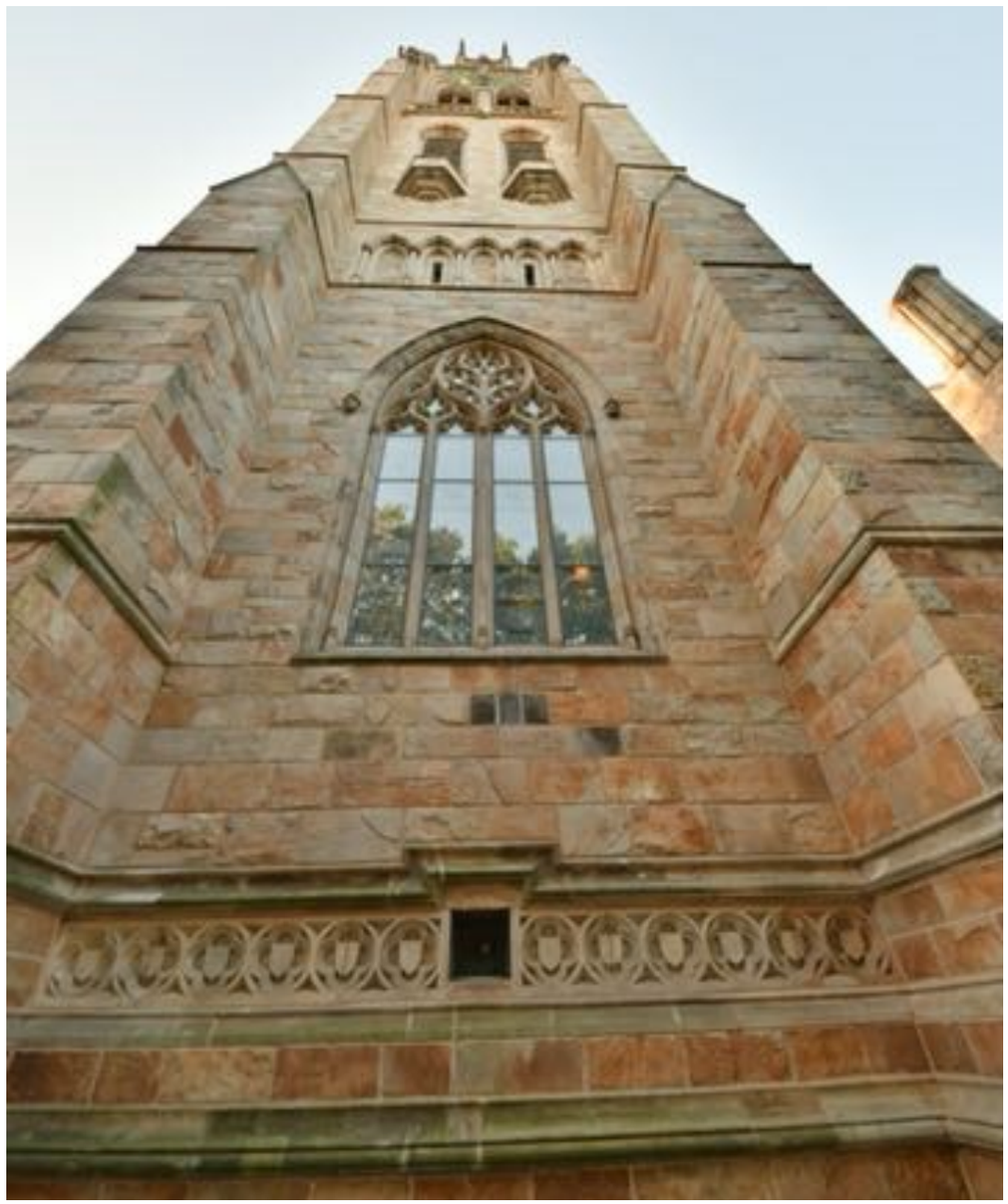
> Figure out, pretty good



Language use

Most common mistakes:

- Its vs. it's (the latter should be "it is"!)
- Users' vs. user's vs. users



Be consistent!

Consistently use the same terms

E.g. “participant” or “subject”? “System” or “program”?

Follow the provided template

Headings, captions, etc.

Citations/reference style

Past/present tense

Past tense: something you did

methods and results*

Present tense: implications

intro and discussion

Related work: either way is possible

but be consistent

Users/participants

When you talk about your study/results: participants

> Older participants were more less to disclose

When you talk about implications: users

> This suggests that older users are more concerned

Be consistent with this!

Final tip

Make sure you read Bem 2002!