Mechanics of document formatting
Comparing strategies between undergraduates and graduates

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Motivation

Research Questions:
- How do undergraduates and graduates format documents?
- Does education level affect formatting strategies?

- Few studies exist on how people edit documents.

- This will provide insights on documents edited by workers on Amazon Mechanical Turk (AMT), who will receive documents created by blind people for formatting.
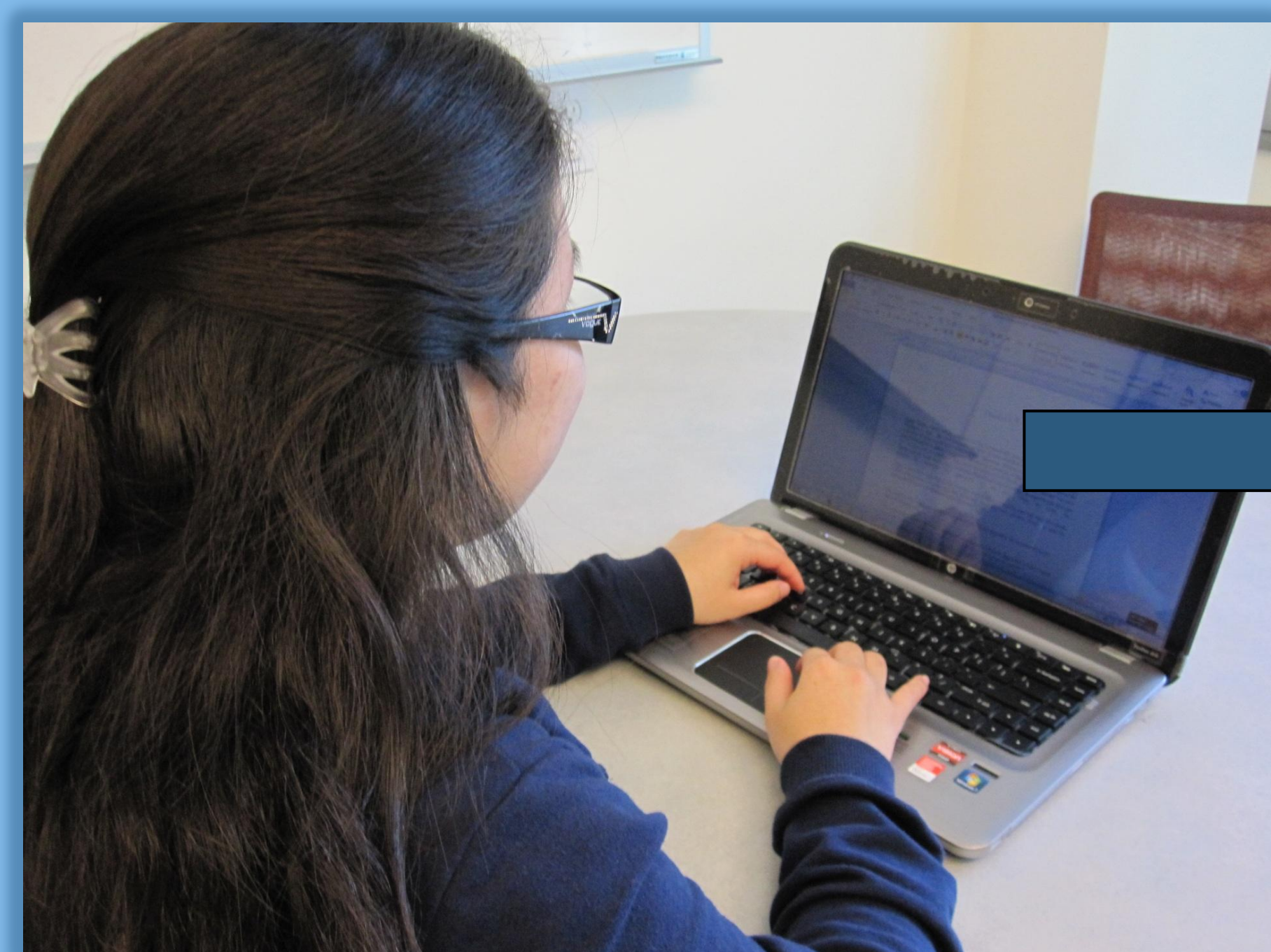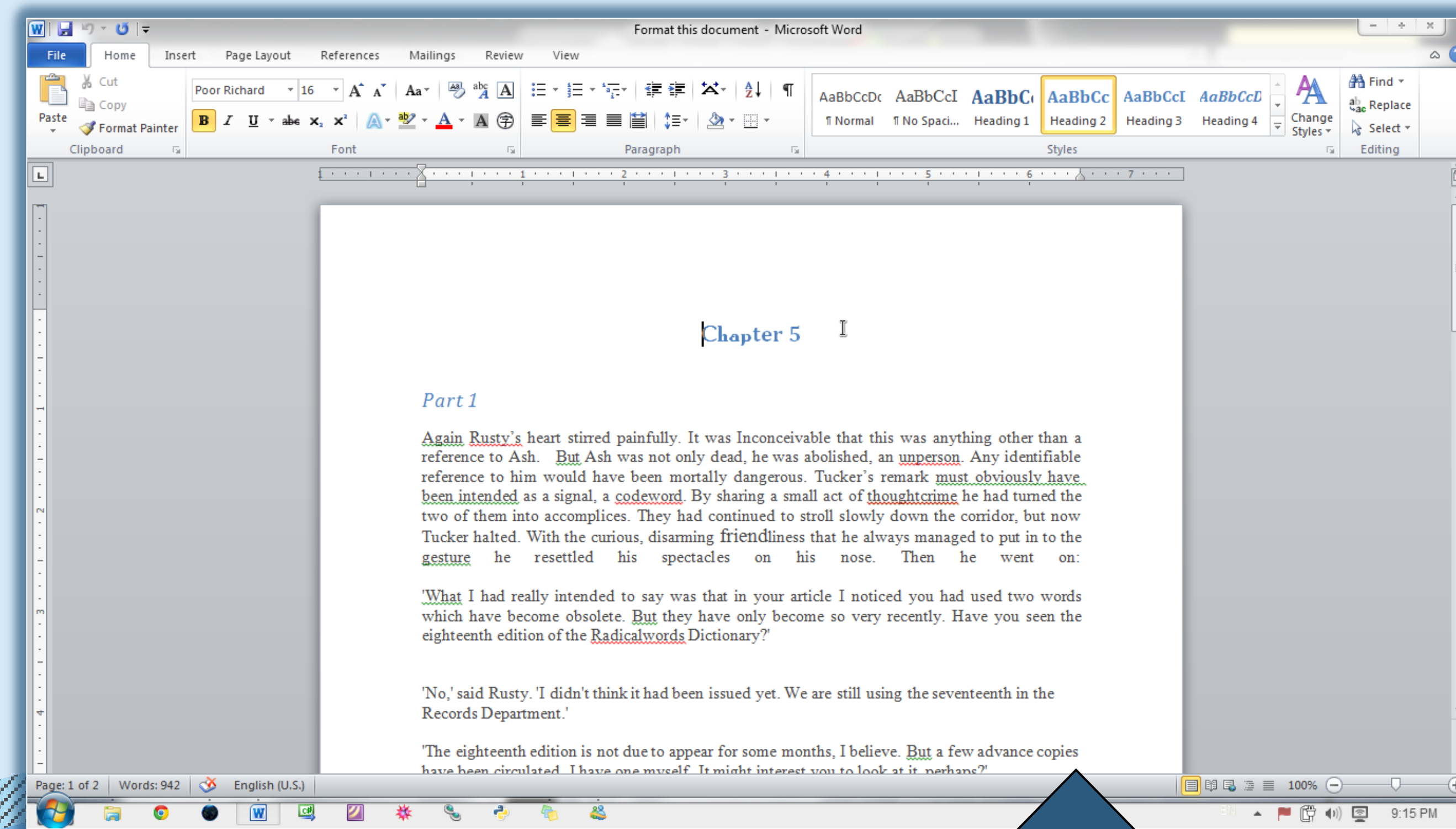

Figure 1. Zoomed in view of the document to be formatted.

References

A. Kittur, E. H. Chi, and B. Suh, "Crowdsourcing user studies with Mechanical Turk," in *CHI 2008 Proceedings*, 2008, pp. 453-456.

D. G. . Evans, T. Diggle, S. H. Kurniawan, and P. Blenkhorn, "An investigation into formatting and layout errors produced by blind word-processor users and an evaluation of prototype error prevention and correction techniques," *IEEE Transactions of Neural Systems and Rehabilitation Engineering*, vol.2, no. 3, pp.257-268, Sept. 2003.

Methods

- **User Study Goal**: To investigate how undergrads and grads format documents using Microsoft Word (MS) 2010.

- **Study Procedure**:
  - Each participant was given a document with inconsistencies and asked to format it.
  - Each participant used the Think Aloud Method to explain their actions while they were recorded.

- **Data Analysis (Qualitative):**
  - Transcribed the recordings.
  - Used Open-Coding to extract themes.
  - Developed Thematic networks, which showed how themes were generalized.
  - Conducted Hierarchical Task Analysis, explaining the process of formatting a document.
  - Completed a comparative analysis for the two groups of participants.

Typical User Behavior

1. Look through document
- Determine what is most consistent.
- Get a feel of inconsistencies like font, spacing, and position of text.
- Decide on desired style.

2. How to decide on making changes
- Use context.
- See if inconsistencies were done for emphasis.
- Look at different options before deciding.

3. Steps to make changes
- Look in a top-down manner.
- Refer to step 2 to decide on how to make changes.
- Use Ribbon or keyboard to fix errors.
  - Apply to headings and then body text.

4. Check before submitting
- Follow step 3 until there are no errors left.

Figure 2. Procedure that undergrads and grads took to format their document.

Undergraduates
- Used individual MS formatting interface buttons to make changes
- Read or skimmed entire document
- Noticed more inconsistencies

Graduates
- Used format painter on Ribbon
- Focused on efficiency
- Missed less obvious inconsistencies such as word spacing and capitalization

Both
- Looked at text before editing
- Tried to make everything consistent
- Corrected in a top-down manner
- Reasoned whether inconsistencies were done for emphasis by looking at context
- Fixed inconsistencies dealing with font and position of text
- Referred to other document sections as a guideline before making changes
- Moved cursor to navigate text and to arrive at error
- Highlighted and then used Ribbon and keyboard to fix formatting
- Checked before submitting

Figure 3. Similarities and differences between the approaches taken by undergraduates and graduates.

Conclusion
- Undergraduates and graduates think alike when they format a document, but use different software interface tools and different approaches to find inconsistencies.

- Education level does not affect the way the participants corrected a document.

Next Steps
- We will use this information to develop the worker prompt for Amazon Mechanical Turk (AMT) workers related to formatting documents for blind users.

- We will investigate the reliability and cost effectiveness of AMT worker output.

Acknowledgments