

STA130 Winter 2020

(Materials used in this presentation are provided by the U of T Statistical Sciences Department.

This presentation was prepared by Vivian Ngo.)

[Github.com/vivianngo97/STA130-Winter-2020](https://github.com/vivianngo97/STA130-Winter-2020)

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Agenda

- Vocabulary
- Group discussion
- Writing examples
- Writing exercise

Vocabulary

- Mean, average
- Median
- Standard deviation
- Variance
- Boxplot
- Interquartile range
- Quartile
- Data frame
- Summary table/statistics
- Types of variables: e.g. character, numeric, logical
- Outlier
- R object
- Vector
- Proportion

Ice breaker!



Group Discussion

- When to use **boxplots**?
- Examples of when to use boxplots?

Group Discussion

- When to use **boxplots?**
- Examples of when to use boxplots?
 - Amount of rainfall
 - Heights of students
 - Amount of air pollution
 - Temperature

Group Discussion

- *For Question 1, you used both **histograms** and **boxplots** to visualize your data. Which features were easier/harder to observe from each of the visualizations? In what situations may you want to choose a boxplot over a histogram, or vice versa? Explain.*
- *Based on your plot in Question 2d, can you determine if the same number of rainfall observations were recorded each decade? Why or why not?*
- *Why might it be useful to provide a summary table? (You made one in Question 2h)*

Writing example

An Assessment of Oral Health on the Pine Ridge Indian Reservation. (Gallegos, JR et al.)
Modified for this course

We assessed the oral health of a group of local Indigenous people living in the Pine Ridge Indian Reservation.	Purpose
Based on a sample of 292 adults and children, screening personnel counted the number of decayed teeth, total teeth, and dental cavities (both filled and unfilled).	Methods. Very simple because not statistics based. You should include more detail here.
On average, each individual had 4 decayed teeth. Half of adults had 27 or fewer teeth and 26% had an unfilled cavity. Further, 75% of children (<5 years of age) had an unfilled cavity.	Results. Notice how only things critical to their purpose and methods are included. Very concise!
Amongst the people of Pine Ridge, our study documented a high prevalence of cavities, numerous people with missing teeth, and many unmet dental needs, particularly among children. Future studies of oral health related behaviors, and access to oral health care are needed to explain the dental, periodontal, and soft tissue problems that adversely affect the people of the Pine Ridge Indian Reservation.	Conclusion (and recommendation)

Writing example

- *Participants were 477 male, first year students at a liberal arts college. In the week before the start of classes, participants were given two surveys: one of expected college engagement, and the second of video game usage, including a measure of video game addiction. Results suggested that video game addiction is (a) negatively correlated with expected college engagement, (b) negatively correlated with college grade point average (GPA), even when controlling for high school GPA, and (c) negatively correlated with drug and alcohol violations that occurred during the first year in college.*
- More examples with explanations for what makes them effective/ poor can be found here: <https://www.kibin.com/essay-writing-blog/10-good-abstract-examples/>

Writing example

- **When communicating your work, it's important to include 4 critical items:**
 - The purpose. What is it that you're studying? Why should we care about the analytical work you've done?
 - A summary of the methods you used. What did you do? Why did you do it this way?
 - A summary of the results. We don't need to know everything you found – only the most critical things relating to your purpose! Remember, sometimes less is more!
 - A conclusion. What is your take away message? Remember, a conclusion is not the place to present new findings.
- *Most importantly, your “story” should be clear, concise, cohesive, and complete! Like a real story, it should have a clear beginning, middle and end.*
 - Complete — cover the important parts of the project, study, or analysis
 - Concise — contain no excess wordiness or unnecessary information
 - Clear — readable, well organized, and not too jargon-laden
 - Cohesive — flows smoothly between the parts

Writing Activity

- Imagine you've been hired as a statistical consultant for CP24, a local news station. They've asked you to put together a short **report based on your recent research regarding historical temperatures and rainfall in Australia (practice problem questions 1 and 2)**. Your boss has asked you to deliver a short, written summary of your most interesting research findings. They want this by the end of the day because they'd like to include them in the 6pm news report. It's already 3:30 pm and it's a Friday!
- Remember, the newsroom is a busy place. They only want the most important information and they don't want to read more than half a page of text. Use visuals to help get key points across, if you can. The news team has only limited statistical background, so make sure everything is clear and makes sense! Remember to start with the purpose – the team is busy with so many news stories and they may have forgotten exactly what your research was about! Also make sure to include a complete, but concise, summary of the methods, key results, and a conclusion.
- Remember, you're the statistics expert and the team are counting on *you* to summarize this research!