1.4: Intro to Statistical Writing

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1 Why so much writing?

For the undergraduate students:

- The university requires that you take a communications intensive course beyond ENGL 2010.
- The university has determined that this course contains enough opportunities to communicate (through writing and presentations) to qualify as such a course.
  - If this course was not a CI course, some of our undergraduate statistics majors would fall short of the requirements of graduation.

For the graduates:

- Most, if not all, of you will be required to communicate your research, often in the form of a thesis, dissertation, or journal article.
- The ability to effectively communicate your efforts in these venues is absolutely vital to the success of your research.
- Despite this importance, we offer very little training in how to write effectively.

For all:

- **The ability to effectively communicate quantitative information will give you a competitive advantage in graduate school or in the workforce.**

2 General Writing Tips

Use concise, straightforward language.

- Intelligent writing doesn't require using fancy words.
- Concise writing will help retain interest in what you are saying.

(start)

> We first employed forward variable selection on our model. This told us that we should remove the variables X_2 and X_7. We acknowledge that the aforementioned method is suboptimal for use in variable selection. We then tried backwards variable selection, which told us to remove X_1, X_2, X_4, and X_{11}. Finally, we tried the stepwise variable selection approach which told us to remove X_2 and X_{11}. Because the backwards and stepwise regression both suggested the removal of X_2 and X_{11}, we decided that we would eliminate these variables from our model.

(improved)

> We tried several variable selection techniques, including forward, backwards, and stepwise selection. Each method suggested we remove different variables, but backwards and stepwise selection both recommended the removal of X_2 and X_{11}. This agreement across selection methods prompted us to remove these variables in our final model.

Use active voice whenever possible

- Active voice is more concise and gives you ownership over your results.
- Personal pronouns are OK, but use "we" instead of "I", even if you are the only author.

(start)

It was determined that the variable X_2 should be removed from the model.

(better)

We removed the variable X_2 from our model.

Make sure you provide meaning to the numerical results in the introduction and conclusion of your paper.

- Your ultimate goal is to persuade people that their is valuable information contained in the data.
- Simply presenting a table of results fails to persuade people as to why the results are important.
- Providing a "why" in your writing make readers more likely to pay attention to your analysis.

3 Using LaTeX

- LaTeX is a markup language intended for scientific writing.
- It is particularly good for including **references** and **mathematical equations**.

Writing equations:

%	Add a comment to your document (ignored when compiling the document).
$ ... $	Add an equation to the current line of text.
$$ ... $$	Put an equation on its own line.
\[... \]	Put an equation on its own line.

Referencing Equations

You can also number and label equations to include them in the text.

```
\begin{equation}
E = mc^2
\label{eq1}
\end{equation}
Reference Equation \ref{eq1} in the text.
```

$$E = mc^2 \tag{1}$$

Reference Equation 1 in the text.

The same goes for referencing figures and tables.

```
\begin{figure}[H] % H command requires 'float' package
\centering
\includegraphics[width = 0.25\textwidth]{figures/module1/usu.png}
\caption{This is the Utah State Logo}
\label{fig1}

The USU logo is included in Figure \ref{fig1}.
\end{figure}
```

Figure 1: This is the Utah State Logo

The USU logo is included in Figure 1.
The equation environment includes commands for all the greek letters as well. Check out:

`https://www.overleaf.com/learn/latex/List_of_Greek_letters_and_math_symbols`