

# DISSERTATION TITLE

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A dissertation submitted to the faculty at the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of xxx in the xxx.

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## **ABSTRACT**

Dissertation Author: Dissertation Title  
(Under the direction of Advisor)

this is good stuff

To someone

## **ACKNOWLEDGEMENTS**

Insert your acknowledgements here.

This should be one page maximum, and is single-spaced by default.

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## CHAPTER 1

### Introduction - Markdown and $\text{\LaTeX}$

This is a piecemeal rendition of the University of Arizona thesis class (`uathesis`) reworked to be compatible with `Rmarkdown`. The majority of the heavy lifting was already done by colleagues in the Department of Planetary Sciences at the U of A (see the `uathesis.cls` file for more information). In essence all I have done is include the proper adjustments so that it plays nicely with `knitr`. As of now (Sat Sep 10 09:17:50 2016), `knitr` and R are fully functional. That said, some other issues still remain.

#### 1.1 Issues

- Knitr captions
  - include captions from knitr call
  - include figure in LOF from knitr call

#### 1.2 Basic structure

The basic structure of the thesis package has been cleaned up significantly. There are now two folders inside the main directory: **includes** and **sections**. The **includes** folder contains most of the under the hood files that you will generally edit one time to set up the project metadata (i.e. the title, committee members, etc.), but also includes `.bib` files and figures. The **sections** folder is where the chapters of the dissertation live. Each chapter is its own `.Rmd` file. You will write you chapters in these files and compile the master document. This folder is home to the other less important (but required) sections (i.e. acknowledgments, dedications, abstracts and appendices).<sup>1</sup>

---

<sup>1</sup>All of these files are imported into the final pdf in the `master.Rmd` file via `knitr` or specific commands written for the `uathesis` class.

The underlying engine is L<sup>A</sup>T<sub>E</sub>X. To generate the dissertation pdf, compile the `master.Rmd` file in your favorite text editor.

## 1.3 Sections

You can use either markdown or L<sup>A</sup>T<sub>E</sub>X to create sections in the document (see general markdown syntax for more information). In both cases, cross-referencing figure, tables, sections, chapters, etc. can only be done if a `label{}` is created. For example, this is section 1.3. I generated that number by first labeling the section...

```
# Sections\label{sections}
```

and then by typing...

```
\ref{sections}
```

It is helpful to use this with figures and tables. Like, for Figure 1.1 and Table 2.3 below.

### 1.3.1 Subsections

You can use hashtags or the `\subsection{}` command to create a subsection.

**1.3.1.1 Subsubsections** These have been fixed. You can use `\subsubsection{}` or 3 hashtags.

#### 1.3.1.1.1 Subsubsubsections

If you really need to go this deep, I suggest using the `\paragraph{}` command.

## 1.4 Math Example

Equations can be rendered beautifully by using the `equation` environment.

$$y = mx + b \tag{1.1}$$

But, old school math works too!

$$y = \beta_0 + \beta_1 + x_1 + \epsilon$$

But putting it inside the `equation` environment will number it (as in the first example), and has the added advantage of centering automatically as well.

$$y = \beta_0 + \beta_1 + x_1 + \epsilon \tag{1.2}$$

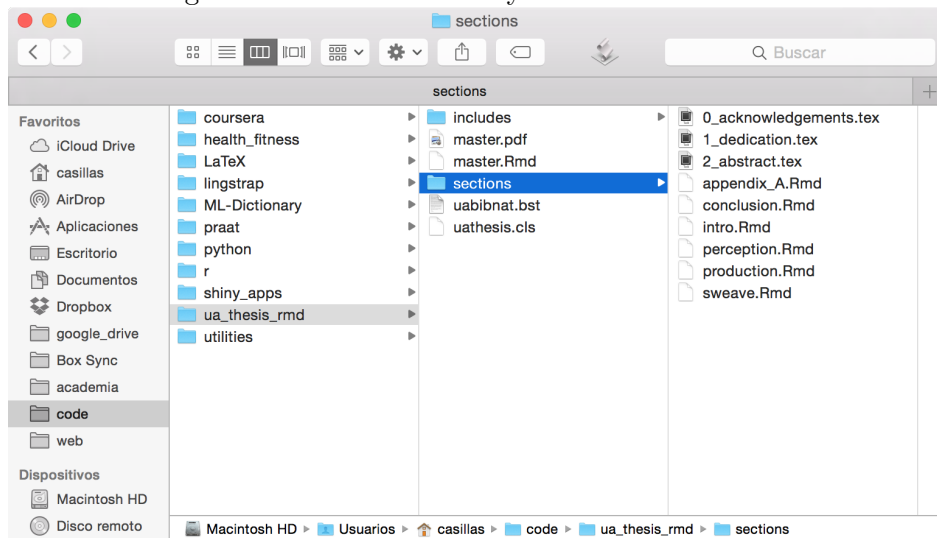
## 1.5 How to cite your references

One relevant difference from the previous iteration of this package is that it now uses `Rmarkdown/pandoc` to render citations. This is a work in progress, but for now you can reference by using the standard `[@citekey]` method. For example, citations are cool [1]. For inline citations, remove the brackets (i.e. `@articletwo`). As in [2] said many things.

## 1.6 Graphics

This took a little cajoling, but the figures are now working. They are automatically included in the list of figures and you can use the brackets in the caption to establish a different LOF caption (separate from the one you see below.).

Figure 1.1: Here is a screeny of the sections folder.



One thing to remember is that when including images the home directory is always that of the

master.Rmd document. Therefore, it is necessary to establish the path to the img file from there. Here is the code used to produce the above figure:

```
\begin{figure}[h]
  \centering
  \includegraphics[width=.75\textwidth]{./includes/figures/ex.png}
  \caption[Example figure]{Here is a screeny of the sections folder.}
  \label{fig:firstfig}
\end{figure}
```

## CHAPTER 2

### More $\LaTeX$

#### 2.1 Tables

Tables work the same way as before...

Table 2.1: Another table caption (to appear with the actual table).

Col A	Col B	Col C
1	2	3
4	5	6

They can be rendered in markdown now as well (and can include r code), but I don't recommend this combination (for now)...

Col 1	Col 2	col 3
4	plus	8
equals	12	nice!

On the next page is a sample table, placed on the page by itself. Sometimes tables can be wider than they are tall, and you may need to rotate the table by 90° to make it fit better on a page by itself. To do that you can use the `lscap` package. To use it, wrap the table commands in a `begin` and `end landscape` command and that table will be properly rotated.

Table 2.3: Sample table caption (to appear with the actual table).

Col A	Col B	Col C
1	2	3
4	5	6

Note that the `\caption` command can have a short and a long version inside a table environment, just like inside a figure environment (see 1.6).

## 2.2 TIPA

You can include IPA characters via the `TIPA` package. Here is an example:

[fɪp]-[fɪp] - Looks good.

## CHAPTER 3

### Using R

#### 3.1 Basic math

Here are some simple math examples

```
24 - 23
```

```
## [1] 1
```

```
2345 * 23
```

```
## [1] 53935
```

#### 3.2 Inline expressions

You can use inline r expressions like  $2 \text{ plus } 2 = 0$

#### 3.3 Run models

```
library(xtable); library(dplyr)
mtcars %>%
  glm(vs ~ mpg, data = ., family = "binomial") %>%
  xtable(., type = "latex") %>%
  print(comment = FALSE)
```

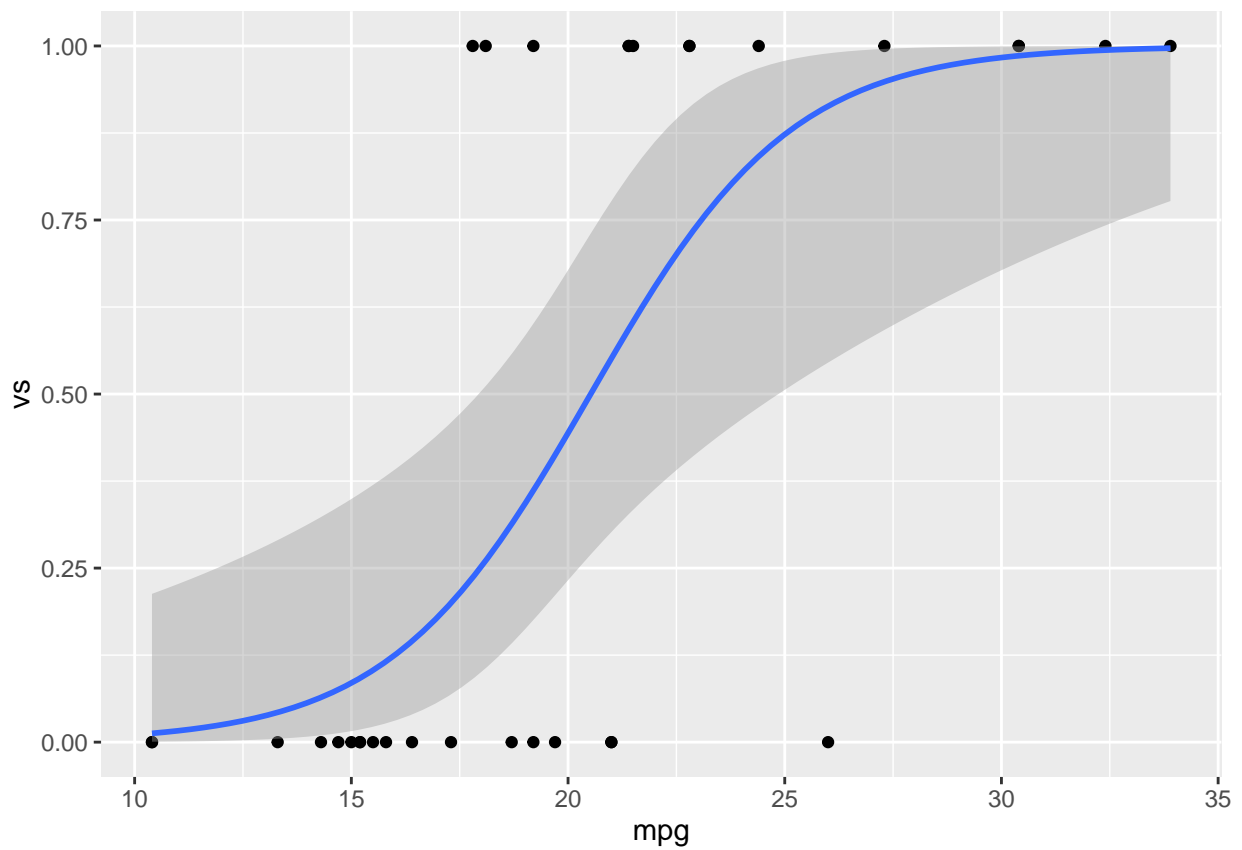
	Estimate	Std. Error	z value	Pr(> z )
(Intercept)	-8.8331	3.1623	-2.79	0.0052
mpg	0.4304	0.1584	2.72	0.0066



### 3.4 Plots

And you can generate plots directly from this file as well.

```
library(ggplot2)
ggplot(mtcars, aes(x = mpg, y = vs)) +
  geom_point() +
  geom_smooth(method = "glm", method.args=list(family="binomial"))
```



## CHAPTER 4

### Sourcing .R files

#### 4.1 Import scripts

We can use the following command to import an r script:

```
library(knitr)
read_chunk('../includes/scripts/test.R')
```

#### 4.2 Call chunks

```
library(dplyr); library(lingStuff)
```

```
# Generate data

set.seed(1)
vot = rnorm(20, 15, 5)
vot = sort(vot)
phon = c(0,1,0,0,0,0,0,1,0,1,0,1,0,1,1,1,1,1,1,1)
df = as.data.frame(cbind(vot, phon))
```

```
# Fit model

glm <- glm(phon ~ vot, data = df, family = "binomial")
```

```
# Get crossover point
```

```
crossOver(glm)
```

```
## [1] 15.53595
```

. Good. Let's plot it ->

```
# Plot regression with crossover point
```

```
plot(df$vot, df$phon, xlab = "vot", ylab = "phon",  
     pch = 16, col = rgb(0, 0, 204, 102, maxColorValue = 255))  
curve(predict(glm, data.frame(vot = x), type = "resp"), add = TRUE)  
points(vot, fitted(glm), pch = 20)  
abline(v = crossOver(glm), lty = 2, lwd = 0.75)  
abline(h = 0.5, v = 0)
```

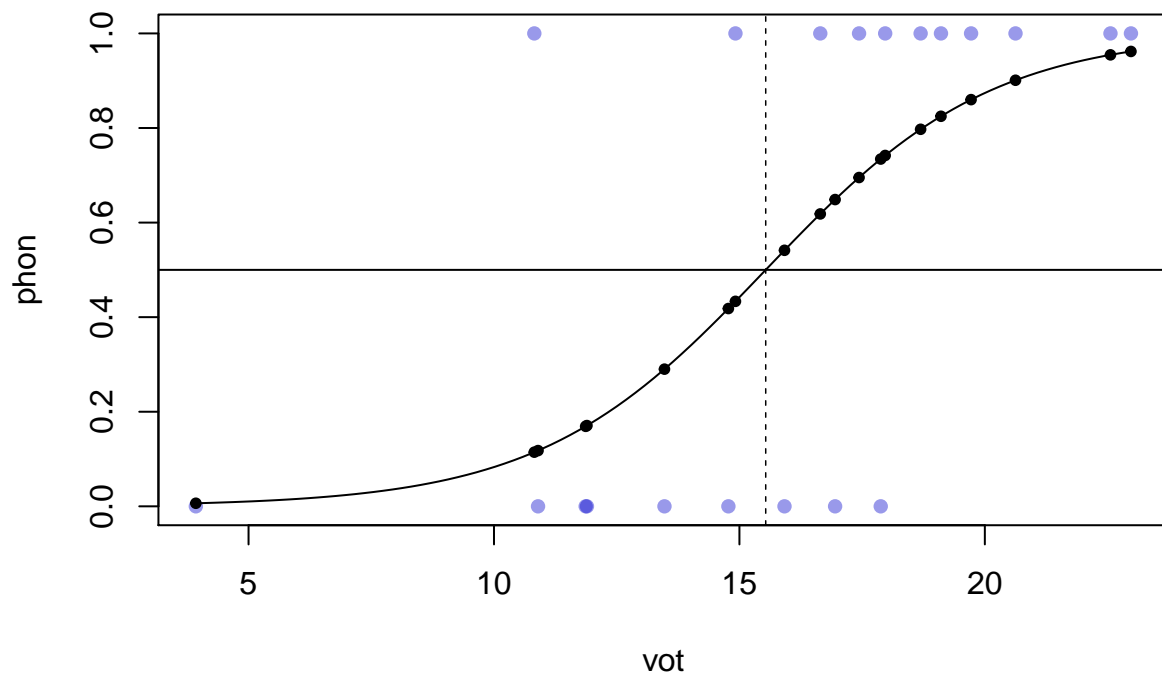


Figure 4.1: This is the caption

## APPENDIX A

### **Sample Appendix**

Stuff....

## APPENDIX B

### **Another Appendix**

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

## REFERENCES

- [1] Author F, Author S, Author T. Random article about some stuff. Random Journal 2002;666:1–20.
- [2] Author F, Author S, Author T. Some more random stuff. Random Journal 2015;675:1–20.