

Best Practices for the Political Scientist

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 - ▶ Helps you in six months (or tomorrow)

A Quick Overview...

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- ▶ 20 years later, some grad student wants to extend our work
- ▶ How did we make Figure 1?
- ▶ Non-plain text files may be unusable 20 years from now
- ▶ Word processors (like MS Word) are stupid and inefficient

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- ▶ These source files (for example, .R for R scripts or .do for Stat do-files) should be liberally commented
- ▶ Comments explain what you are doing to your future self, collaborators, and others

Comment example

```
# This code creates Fig 1
# I use the mtcars dataset (included with R)
library(ggplot2)
ggplot(mtcars, aes(mpg, wt)) +
  geom_point() +
  geom_smooth(method="lm") # Adds OLS line with SEs
ggsave("fig/fig1.pdf")
```

- Save this code snippet as fig1.R (or similar)

Literate programming and reproducible research

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- ▶ Previous example - have two files for one plot in a paper
 - ▶ The paper itself (document.tex or similar)
 - ▶ the script to create the figure (fig1.R or similar)
- ▶ What if we could combine these to have everything in one easy-to-read file?
 - ▶ This is what literate programming is all about!

Literate programming example (using knitr)

```
\begin{section}
```

This is an example paragraph, written in `\LaTeX`.

Using knitr, we can include R code in the following manner.

I can reference the figure number by calling `ref`:

Figure `\ref{fig:mpg-and-weight}`.

```
% NTS - updating that figure with squared x doesn't change
```

```
\begin{figure}
```

```
\centering
```

```
<<fig1plot>>= # Starts R code, labels it `fig1plot`
```

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  geom_smooth(method="lm") # Adds OLS line with SEs
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```
@ % closes R code
```

```
\caption{Miles per gallon and weight}
```

```
\label{fig:mpg-and-weight}
```

```
\end{figure}
```

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- ▶ This can be as simple as putting things in Dropbox, which enables you to recover previous file versions automatically
- ▶ Word's "track changes" feature...

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 - ▶ ((show example paper))

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 - ▶ I included the PDFs, which is unusual since they aren't plain text

Bonus best practice - Test your code!

- ▶ If you write your own function, it is important to test it to make sure it does what you want it to do!

```
my_mean <- function(dat){  
  the_sum <- numeric()  
  N <- length(dat)  
  for (i in 1:N){  
    if(i==1){the_sum <- dat[1]}  
    else{  
      the_sum <- the_sum * dat[i]  
    }  
  }  
  my_mean <- the_sum / N  
  my_mean  
}  
mean_of_zero <- c(-2, -1, 1, 2)  
my_mean(mean_of_zero)
```

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

For further reading - Literate data analysis

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- ▶ StatWeave
- ▶ Google “Sweave for Stata” or “reproducible research and Stata”

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