

# Best Practices for the Political Scientist

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  - ▶ Helps you in six months (or tomorrow)

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- ▶ Non-plain text files may be unusable 20 years from now
- ▶ Word processors (like MS Word) are stupid and inefficient
- ▶ Bonus: plain text files are usually *much* smaller than their Word/pdf counterparts

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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)

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  - ▶ 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 and $\text{\LaTeX}$ )

```
\section{Introduction to Literate Programming}
```

This is an example paragraph, written in  $\text{\LaTeX}$ .

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

I can reference the figure number by calling ref:

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

% NOTE: updating that figure with  $x^2$  doesn't change it

```
\begin{figure}
```

```
\centering
```

```
<<fig1plot, echo=FALSE>>= # Starts R code, labels it `fig1`
```

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# I use the mtcars dataset (included with R)
```

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library(ggplot2)
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ggplot(mtcars, aes(mpg, wt)) +
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  geom_point() +
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  geom_smooth(method="lm") # Adds OLS line with SEs
```

```
@ % closes R code
```

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

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

```
\end{figure}
```

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- ▶ Word's "track changes" feature. . .

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- ▶ Word's "track changes" feature...
  - ▶ This is usually used poorly
  - ▶ Requires saving a new file each time you edit

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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
```

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

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  - ▶ Using GitFlow