# How to learn R?

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## Case for learning and using R

R is becoming an prevalent programming language in political science (and particularly in the world of data analysis and data science). Compared to SAS or STATA, R can be incredibly challenging if you are not familiar with its basics. After all, R has a **language** of its own, and learning a language requires time, devotion, and most importantly, constant practice. So, be patient!

Before sharing my resources (e.g., websites, books, or tools) to learn R, I want to make a case for R and R Studio. I learned STATA during my graduate education because I had to. However, I find R superior to other programs for a couple of reasons. Of course, R has its shortcomings - which I will mention here. There are numerous reasons why you should learn R. I am going to briefly list some of the reasons why R could be a more suitable programming language for you:

- It is free! STATA is pretty common in political science, but it is not free. R and R Studio, on the other hand, is free. Similarly, Python is also free. Yet, in my experience, learning R was easier, and Python use is limited in the political science field at the moment.

- If you have a question about R, there is a 99.99 % chance that you will find your answer very quickly. R has a huge online community and resources to find answers and solutions to your problems. Since it is open-source, you can also contribute to developing R by customizing its packages, developing new ones, and resolving issues. I will talk more about these communities in the Resources for R section.

- R has its command-line interface, but R Studio - open-source, third-party graphical user interface - makes learning and using R simpler. R Studio's text editor helps you write code more efficiently with features like

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code completion. Its pane view lets you script, interact with your data/program, view tables, view function documentations, and do other things in a single window. It also has power user features, like automating package development, which you will find super helpful as you become an advanced user. Also, you can use R-Studio online, which is a nice bonus.

- Using, R Markdown, you can write and create high-quality documents, reports, presentations, and dashboards in R. So, it is an all-in-one deal. Learning R Markdown is easy to use if you are familiar with LaTeX.

- You can access a variety of packages with R's depository CRAN. You can contribute to developing these packages access to their documentation and earlier versions.

- With R, you can produce high-quality plots and graphs. The popular packages like *ggplot2* allow researchers for aesthetic and visually appealing graphs that set R apart from other programming languages. Journals and publishing are more oriented towards graphs instead of tables nowadays. This creates a demand for aesthetically pleasing visuals, which R can provide. I know a lot of faculty members who switched to using R - just for visuals!

- Your skills in R are not limited to our field. R is a highly popular programming language that will allow you to find jobs in other sectors as well.[1]

These are great qualities of R, and this programming language is getting very popular in political science. Still, I have to come to terms with its several shortcomings:

- The learning curve for R is very steep! This is not a point-and-click programming language, and it requires you to learn commands and coding in detail. One needs to spend hundreds of hours to learn basics intuitively. The good news is that once you learn the basics very well, you will not waste time advancing in R.

- Think of R as your phone; it is pretty dull and not very useful without some apps. So, the base R can be handy, but nowadays, packages that you will install to your R are necessary. Besides learning base R, one needs to excel at packages like tidyverse which becomes very useful, especially for data wrangling. Still, the good news is that these packages come with cheat sheets that can help you learn stuff (and retrieve information when necessary).

- For some professionals, R packages and the R programming language can be much slower than other languages like MATLAB and Python. Still, this depends on your statistical needs. For political science, I think R is more than enough!

[1] Check here for instance, some company names that relies on using R.

# Resources for R

## Learning R in R

The best way to learn R is using R. (duh!) Rather than spending hours on courses; I would recommend the following for beginners:

- Swirl

## Online courses

Still, Swirl is limited in case you need to use different packages and perform statistical analysis. Hence, here are some courses that I did and found very useful:

- **DataCamp**: I completed Data Scientist Track with R in DataCamp. This is just one of the tracks or courses that they offer. The problem is that these tracks or courses can be costly. So, before spending a lot of money on a course, make sure that you need it, and you will commit to the classes!
- **Coursera**. I completed Statistics with R Specialization which is taught by Duke University and consists of 5 courses. Again, this is not free to get a certificate and complete all quizzes. They also have other courses in R that teaches statistics or data visualization.
- I know that there are other sources like Udemy, but I did not have a chance to look at the courses in this source. Since you will pay a substantial amount of money for these classes, make sure to pick a good one. I recommend asking people who know R when deciding on courses like this.

## Books for more hands-on experience

There are a lot of textbooks that use R as their program, or that particularly teaches R. I am familiar with the following and find it useful.

- R for Data Science: Simple, yet, an amazing book by Hadley Wickham if you want to learn R from start to finish. Wickham is the author of numerous R packages and the Chief Scientist at R Studio. You will quickly notice his impact on the community once you deep dive into packages and everything else. Since you will be reading codes of other users and communicating with them, it would be wise to be a 'student' of Wickham and get used to his style of R coding.
- ggplot2: Elegant Graphics for Data Analysis (Use R!). This book is all about creating graphics using R, written by Hadley Wickham.
- Monogan, James E., III. 2015. Political Analysis Using R. New York: Springer. This book is beneficial for political science students since the examples are a replication of existing scholarly work.

- Teacup Giraffes and Statistics is an exciting and fun way to learn basic R and statistics (e.g., distributions, correlations, and standard error).
- UCLA's IDRE is another excellent source to get to know the basics of R. This website also has data analysis examples which can be very useful if you want to recall basics.

### Not very extensive list of online resources that might help you discover R (e.g., blogs, websites, people)

As I said before, R has a massive and diverse online community. Here are some websites and resources I frequently use:

- StackOverFlow is a great community to find answers to your questions! This is my go-to address if I need something.
- Software Carpentary is another excellent source - and, not just for R but Phyton and others. You can find workshops to join and access previous lessons and materials.
- UseR! Conferences is also another event to keep an eye on to closely monitor developments about R. You can find the details and topics for the conference in here.
- R Ladies is a global organization that wants to promote gender diversity in the R community.
- People often share their screencasts for teaching R. Here is an example from Shiro Kuriwaki. He also has excellent sources for learning GitHub.
- The R Graph Gallery is a cool way to explore different kinds of plots and graphs you can make in R.
- Hadley Wickam's website for learning advanced R.
- Using R with spatial data can be challenging, but this website is the ultimate source.
- This website is for those who are interested in R with Text-as-Data.
- You can make your own websites in R! Yes, R is an excellent source for making your website or blogs. Beginners beware! Blogdown and other ways to make your website and/or blog are a bit challenging for first-time users. So, a little bit of experience in R is necessary to use *blogdown*. I prefer GitHub for making websites.
- Here is the basics of web scraping in R.
- R Markdown is a great tool to write/prepare high-quality documents or presentations. In my opinion, it is also straightforward to use if you know LaTeX.

- You can make beautiful tables using gf package that I like.
- Big Book of R is a great initiative that gathers every R-related programming book together. This is a great one-stop and the only bookmark you need about R.
- If you are a passionate user of DAGs (directed acyclic graphs), here is an excellent introduction.
- If you are planning to share your coding in your papers or presentations, Carbon is a great website for you to create and share beautiful images of your source code.