Secrets to Success 🔍

Coleman lab

BEST PRACTICES

Challenges ahead

Research is hard and academia is hyper-competitive, with many talented people seeking few jobs. The farther you advance in your career, the more elite the pool becomes. And that can lead to or exacerbate **imposter syndrome**.

If you have impostor syndrome, you are hardly alone. I struggle with it too. But, whenever I have reached out to others about it, most say they do too. Much interesting research has asked about it as well.

While feeling like a fraud, to some extent, is common, severe preoccupation with how others perceive you can be destructive. So, do not let impostor syndrome stop you. Dial it down and **aim for authenticity**.

Keep engaging with people who know more than you about a topic and keep asking questions. Scholarly research is all about diverse people (many of whom have impostor syndrome) collaborating to answer questions and solve problems. We need not be smarter than others to contribute to this endeavour. We need only identify one of the myriad unanswered questions and tackle it as best we can.

A successful research career means **always seeking growth**. New skills, knowledge and talents. Meaning, kind of like pro athletes, researchers are constantly "in training". As such, it is most fulfilling if you love the process and work as much as the rewards.

A research career also demands **resilience**. All successful researchers have endured many mistakes, failures, dead ends and even disasters, not to mention rejections. You must be able to pick yourself up, dust yourself off, find the lesson within and move on.

Being productive

Work smarter, not harder. Instead of working endless hours for the sake of working, try to make every work hour count and work on the right things. Be disciplined about data collection, entry and analysis and writing (more details below).

Engage with the wider research community. Attend talks / colloquia by visiting academics, meet with them, reach out to people whose work you admire or find influential. This is networking, and it can make a career.

I believe that **question-driven is superior to system-driven research** (and thank my PhD supervisor for that lesson). For example, instead of wanting to "study bats", start with a question and then identify the best system to address it – that may or may not be bats.

Choosing a question involves considering what we can ask and answer with the available resources and which questions most interest us and the research community. Often, great questions are sparked by our observations about the world around us. Having identified a question, comb the literature to see if it is novel. The alternative, i.e., starting with literature first, can work. But it can also lead us down a rabbit hole or trick us into thinking someone else's questions are the best ones. Remember, our lab culture is adventurous – we think for ourselves.

A common pitfall in grad school is wasting time on seemingly critical tasks that do not really enhance productivity. So, **make a research plan with goals and deadlines**. First, set end goals for your programme. Then, work backward, setting more precise goals for each year and then each month. At the start of each month, list weekly goals with deadlines. To stick to deadlines, share your plan with others and write monthly reports, as mentioned (details below).

When making these 'to do' lists, **ask yourself how each item helps you** graduate or serves your career goals. Next, maybe try categorising tasks as follows and working on them in this order:
1. Important & Urgent (research goals with imminent deadlines),
2. Important but Not Urgent (research goals, e.g., writing an outline for an MS)
3. Not Important but Urgent (other urgent parts of your work)
4. Not Important and Not Urgent (will rarely get done)

Protect your mental health. Mental health or productivity? It is not a zero-sum game. Meaning, productivity is not a prerequisite to mental health and happiness, but mental health is a prerequisite to productivity.

See me if you feel you are floundering or struggling. I am invested in your success.

Monthly reports

Each month, **email me a report**.

The **subject line** should follow this example: name, month, report (e.g., Joanna, 2021 October, report).

It should have **three sections**:
1. progress on previous month's main research goals,
2. goals for the next month,
3. questions for me.

Goals should be specific (e.g., "read 15 papers on my list of 50 papers", "draft chapter 2 of thesis"), as opposed to vague (e.g., "read papers". "work on thesis") **and have deadlines**.

The **purpose** is not for me to judge you or for you to impress me, but rather to allow you to evaluate your own progress and me to see where I can help. Reports also help us prepare for in-person meetings.

Undergrads doing research for credit or pay should **also include their weekly schedule** (hours worked per week) which should match their credit hours.

Reading

Read. A lot. Project-related articles and more widely, ideally something each work day.

Think critically about readings – papers are arguments, not facts. When selecting literature to cite, be judicious (choose them based on merit) and take care to represent them accurately.

Use bibliographic software. Pro tip: each time you get an article relevant to your project, create a record in your software (I use Endnote). Save the article as a pdf (if it is not open access) and link it to that record. Learn and use cite-while-you-write functionality. Trust me when I say this learning curve now will pay off big-time later. If you want to use Endnote but do not know how, I will teach you. That said, CUNY does not subscribe to it, so this is a cost you will bear on your own if you choose it.

Read scholarly articles actively. This takes a lot of concentration, especially when you are new at it. It **involves several practices**. Here are four key ones.

1 Verbalising or writing information down. What is the argument? What is the evidence for it? What question do the data address? What is the method? What is the statistical result? What does each figure portray?

2 Whenever you do not understand something, do not just keep going. Stop and look up new terminology.

3 Do not assume that authors have correctly placed their findings in context, i.e., interpreted prior research properly. Meaning, seek the original source and see for yourself.

4 Identify any problems or limitations that you see and think about how the research could have been done better. Similarly, think of future directions.

Data collection & analysis

Learn and use R. Not because I use it, but because I want you to be better prepared for the research landscape than I was at the end of my PhD (before R became popular). It is popular because it is so flexible and free. But accept that I am an R novice (at least in 2022) and not the world's greatest statistician (just being honest).

I can give you guidance on experimental design and data analysis but will not know all analytical techniques or be able to scrutinise (and fix) your R scripts. In fact, I aim to learn new statistical methods and gain confidence using R from you. And because this lab is a nonjudgmental space where we form mutually beneficial relationships, I hope teaching me new things will be a source of pride for you.

For social-science research, you may opt to use other software, such as SPSS (which I know fairly well and CUNY subscribes to) or specialised Q-method packages. But you really can use R to do all these analyses too.

Annotate R scripts so others can easily (1) see what you did and learn from it, (2) quickly ID mistakes and (3) use the script to repeat / revise an analysis.

That said, you may find **other software helps you produce better looking figures or spiff up charts made in R**. I save R charts as pdfs and use Adobe Illustrator to make them beautiful. Of course, that requires familiarity with Illustrator, which has a steep learning curve. When I am not too busy, I can help you with this because I am quite fast with the software.

As mentioned, always **back up your data to the cloud** (if possible) **and on at least one hard drive**. Raw data come in two formats: the raw material (e.g., biological samples, spectrograms, recorded interviews) and data entered in a spreadsheet. All data must be retained and, for human-subject research, in a way that respects protocols laid out in ethics approvals.

Often, the **best way to organise data is in tidy format** (observations in rows; variables in columns). In Excel, **avoid "secret" systems** (e.g., highlighting, colours) to encode info (at least not without an explicit and immediately visible explanatory guide). **Label all columns with** instantly **understandable variable names**. **Create an accompanying sheet** explaining what each variable means and with a key to your "system", if any. **Save raw data as an Excel file with an informative filename and never modify it**, so the date created and date modified match, proving that no one tampered with your raw data. **Never change values in your raw data**, even if you find errors. Instead create new versions. More tips in this terrific paper (click here).

Writing

Writing promotes systematic thought and reasoned arguments, while helping us work more efficiently (e.g., avoid meetings for meetings sake, not wait to meet before making decisions). Writing can reduce the influence of the loudest voice in the room. It can help break down silos, lead to quicker resolution of conflicts and better cooperation to achieve goals (even when others' goals are not directly tied to ours).

As such, **our lab culture highly values and prioritises writing**, sometimes even over talking. Besides the above-mentioned monthly reports, manifestations and best practices follow.

We **recognise our obligation, as researchers,** to **disseminate our work and knowledge**.

We **write out issues and proposals in depth** to drive clarity of thought.

At least **write something for your projects weekly** – this can be a review of a paper, R code, description of methods, ideas, chapter outline, vision for a poster, proposal, etc.

Understand the main purpose of a paper: to disseminate our work, not pad authors' CVs. So, **aim for plain, concise writing** that clearly communicates our message. This is even more crucial in non-scholarly (e.g., popular) writing.