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## Advice for early-stage Ph.D. students

I know this sounds presumptuous, but if you just started a Ph.D. program, especially in science or engineering, **bookmark this page and read it again once every month.** You won't internalize much of it at the beginning, but more and more parts will start resonating with you as you gradually progress through your Ph.D. journey.

*[First created in 2013 and updated throughout the years whenever I feel like adding something new. Warning: these notes are very very very messy, disorganized, and hastily-written at times since I just wanted to dump info into here without worrying too much about organization..]*

(and yes, i did just misspell organization since I was typing in such a rush!)

### AI-GENERATED SUMMARY OF THIS LONG ARTICLE (AUG 2023)

Just for fun, in Aug 2023 I fed the entire contents of this article into the [Claude 2](#) AI tool, which is capable of taking an entire book's worth of text as input. I then told it to summarize my main points in both a regular tone and then using a more 'provocative' tone. Here's the summary it produced, which is pretty good (although it won't cover any new content I write after Aug 2023)!

[Everything below in this section was written by the Claude 2 AI tool, not by me! So I don't necessarily endorse everything it synthesized ... read the full article for more nuanced details.]

1. **Focus on research, not classes:** The article stresses that class grades and performance don't matter for Ph.D. students - just do enough work to pass your classes. Classes are not how you will be evaluated. Instead, prioritize making progress on your research above all else. Don't use extra time spent on classwork as a way to procrastinate on research.
  - Provocative version: Screw getting good grades! Just hustle enough to pass your classes then get the hell out of there. Your crusty old dissertation committee won't care one bit about your stellar GPA when they're deciding whether to award you a Ph.D.
2. **Manage uncertainty and isolation:** Research can often feel uncertain, with no clear path forward. It can also feel isolating, like you're the only one struggling. The article advises that these feelings are normal. Seek out peer support groups and avoid negative people. Regularly discuss progress with advisors and mentors to get feedback and reduce uncertainty.
  - Provocative: Research can feel lonely and terrifying, like you're the only one lost in a dark forest. But news flash: all your peers are wandering just as aimlessly! So stop moping alone and go make some friends.
3. **Develop research taste:** Early on, read high-quality papers in your field to absorb conventions in methodology, writing, and presentation style. Assist senior students with their projects to learn in an apprenticeship model. Grind

through your own early work before it will be good enough for publication. Taste develops through large volumes of work.

- Provocative: Your first attempts at research will suck badly. But grind through the junk until you can crank out stuff that doesn't totally stink. Qty over quality. Volume over perfection.
4. **Keep moving forward:** The key is to make some amount of progress every single day. If you ever get stuck for more than a few days, immediately seek help from your advisor or others; don't stay silent out of fear. Avoid procrastination traps and activities that feel rewarding but don't advance your research skills.
    - Provocative: Every single day, move your research forward at least an inch. Chain together enough inches and before you know it, you'll have crossed the research marathon finish line. Never break the chain!
  5. **Ask for help when needed:** Don't be afraid to ask busy advisors or professors for help. If you demonstrate care, effort, and initiative in improving, they will want to help you. Come prepared with specific questions when meeting with them. Managing up is about getting what you need from superiors.
    - Provocative: Scared to ask your scary advisor for help? Well too bad, buttercup! If you want to make it in this world, you need to speak up. Managing up is mandatory, not optional. Time to put on your big kid pants.
  6. **Create accountability:** Unlike industry jobs, research lacks concrete day-to-day accountability. Tie your success to others (e.g. contribute to advisor's work, get users for your software) to create external motivation. Make deadlines for yourself (talks, paper submissions).
    - Provocative: Accountability? In academia? HA! Since nobody will force you to make progress, you need to create your own darn accountability. Treat yo self like the employee from hell who needs daily whipping to get things done.
  7. **Focus on research contact hours:** The time spent deeply focused on core research tasks builds tacit knowledge and skills, even if it feels trivial. This also keeps your mind immersed in the problems. Measure contact hours as a metric for success, not just paper publications.
    - Provocative: You could read every textbook ever written about swimming and still drown the first time you jump in the pool. Same goes for research - you need depth-first contact hours in the trenches to build real skills.
  8. **Reflect often with advisor:** Bring concrete artifacts (writing samples, data, diagrams, code, etc.) to discuss in regular meetings with your advisor. This focuses conversations on giving/getting specific feedback rather than just status updates.
    - Provocative: Your advisor meetings will suck if you just sit there blinking vacantly when asked "How's it going?" Bring some materials to ground the conversation in concrete reality.
  9. **Manage your advisor:** Advisors are busy and need reminding. Make clear requests of them for what you need. Frame questions as choices to make rather than open-ended. "Managing up" is gaining skills to work effectively with superiors.
    - Provocative: Your advisor is hella busy. So you need to become a professional cat herder and get what you need from them. Remind them constantly to get where you wanna go.

10. **Develop resilience:** Research involves many hardships including uncertainty, isolation, procrastination, and challenges. Prepare yourself at the outset to persevere through the ups and downs of the Ph.D. journey through self-discipline and not relying solely on advisor help.
  - Provocative: Ph.D. life is a painful slog through darkness and uncertainty. The path is paved with blood, sweat, tears, rejection, and failure. So harden up, build some grit, and get ready to rumble.
11. **Avoid comparisons:** Don't compare yourself to peers who seem more successful. You don't see others' struggles. Focus on your own development. Celebrate peer accomplishments publicly. Avoid competitive or cynical mindsets.
  - Provocative: Your peers' highlight reels on social media are fake as hell. Focus on grinding your own path, not chasing others' shadows. You do you, boo.
12. **Use social media cautiously:** Be thoughtful about pros (connections, learning, community) and cons (distractions, comparison, noise, misalignment with real world). Don't neglect focused solo research time due to social media.
  - Provocative: Procrastinating and comparing yourself to others won't earn you a Ph.D. Stay focused on your research and use social media on your own terms to avoid distractions.

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#### STOP CARING ABOUT CLASSES. JUST DO WHAT YOU NEED TO PASS!

This first one is a super-cliche, but it's also super-true so I will mention it upfront: Nobody cares about how you do in your classes or your GPA during your Ph.D. years. Seriously, nobody cares. I've been involved in hiring Ph.D.s for many years, and my students and colleagues have gone onto all sorts of different jobs ... and not once has anyone ever mentioned GPA or class performance. Ever. Never.

This means that you need to stop caring about your classes and just do whatever you need to do to pass them. You often need to take some classes as part of your Ph.D. degree requirements, so failing is bad because you'll have to waste more time re-taking them. But seriously, no professor is going to be impressed with you if you excelled in their class ... if anything, they will wonder why you're procrastinating from your research by spending so much time on their class. Some of the worst Ph.D. students I've seen have been the ones who spent a ton of time on classes (yes, even on my own classes!). That's not surprising, because it was their way of procrastinating from what actually matters: making progress on their own research.

In my mind, this is the **most important mindset change that undergrads need to undergo when they start a Ph.D. program**. If you've made it this far, then you've spent 12+ years as a kid plus 4+ years in college focusing exclusively on classes. Classes were the only thing that "counted" for over 16 years of your life! And you know how to do them ... pay attention, take notes, do your homework, get help, study for exams, and repeat. And in the end all you get is an "A" grade on your transcript that nobody will ever care about now that you're pursuing a Ph.D.

If you ever find yourself prioritizing your classes over your research, then you're in real trouble. Seriously. It's VERY EASY to procrastinate on your research by sinking time into your classes because you know how to do class stuff so well ... you've done this drill for over 16 years of your life and been good at it! In contrast, research is f\*ing hard, like harder than anything else you could possibly be doing with your time right now. Spending an hour on class work makes you feel productive, comfortable, and satisfied; your brain has been trained for almost two freaking decades to find comfort in this kind of workflow. But spending that same hour on research will

likely feel TERRIBLE since you may be outright stuck, going down some dead-end path, or wondering why you're even doing what you're doing in the first place; then you'll want to crawl back to the warm comfort of class work. Resist that trap.

Allocate time every single day you're working to making some progress on your research, no matter how little (of course, take regular breaks too!). ***Only after you make some progress on your research (even a tiny bit) should you give yourself permission to do some class work.*** If you don't follow this disciplined approach, then you will spend nearly all of your time on classes and fall behind on research, which is the most surefire way to fail out of a Ph.D. program.

Yes, I know it's harsh but true. I had to say it.

[Related: If you need to be a TA in the future, spending an excessive amount of time on TA duties is another classic way to procrastinate on your research. Again, try to make some research progress every day *before* doing your required TA duties. Unfortunately some professors are notorious for overworking their TAs ... try to figure out ways to avoid TA-ing for those people if possible, since you're getting the exact same salary no matter what class you TA for.]

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## UNDERGRAD VERSUS PH.D. RESEARCH

If you're now in a Ph.D. program, you've likely had positive experiences with research as an undergraduate. Also, you've been a good student in school, scoring at the top of your class on exams and projects. And you've probably been praised throughout childhood for being a smart kid.

My first warning for all new Ph.D. students is that Ph.D.-level research will be ***much more difficult*** than undergraduate research both in terms of the technical aspects and also the emotional stresses. So do not underestimate the inevitable hardships that await you in the coming years. One common cause of failure amongst early-stage Ph.D. students is underestimating the difficulty of the process, especially the early stages. At this point, you won't fully grasp the nuances of why this process is so hard, so the only advice I have is just to prepare for immense challenges in the years ahead.

Everyone starts a Ph.D. program with an incredible amount of potential. But most students never come close to approaching their full potential for creative research achievements. And the reason is never because they're not smart or technically capable enough; everyone who gets admitted is smart enough. Rather, factors such as lack of resilience, perseverance, [metacognition](#), and self-discipline are the main contributors to failure at the Ph.D. level. Fortunately, these traits can be fostered via self-reflection and mentorship.

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## UNCERTAINTY AND ISOLATION

All researchers-in-training must constantly grapple with:

- ***uncertainty*** – You have no idea whether the hard work you are putting into your project even matters.
- ***isolation*** – Nobody around you understands or empathizes with what you are doing, since they either lack technical context or are too busy with their own creative struggles.

If you can properly manage these two emotions and make consistent forward progress every single day, get private feedback from a mentor every week or two,

and get external feedback from paper submissions a few times per year, then you can successfully finish your Ph.D.

The bad news is that it's impossible to fully eliminate uncertainty and isolation when doing research. But if it's any consolation, recognize that these feelings are completely normal; all of your fellow grad students are facing them as well.

(*Update on 2014-02-15*: A third daunting problem that many early-stage researchers face is that of **project scoping**. Research is often open-ended, but concrete deliverables must be produced. So how much work is required for an acceptable prototype or experiment? How much is enough for a respectable paper submission? How much is needed for a master's thesis? For a Ph.D. dissertation proposal? For a completed dissertation? In contrast, K-12 and university classes are all well-scoped by instructors' expectations.)

## DEVELOP RESEARCH TASTE

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When you first start your Ph.D., you might want to immediately dive into implementing your own creative ideas. The problem is that your taste isn't yet calibrated to what is considered “good research” by your academic community. Even if you think your taste is impeccable, that doesn't matter one bit; to publish papers and earn a Ph.D., you need to do work that resonates with senior researchers in your field.

But wait ... wasn't the appeal of being a researcher that you can do creative work rather than doing what your superiors order you to do?!? Well, sorta. To innovate in any creative field, you must first understand the tastes of the establishment, and only then can you inject your personal flair. (Matt Might [illustrates nicely](#).)

So how do you develop research taste?

**Read** – Ask your advisor for a set of well-respected papers in your field published within the past few years. To earn a Ph.D., you will need to write papers that look like those, so learn their methodologies, technical conventions, and presentation styles now. Note that old papers might be fun to read, but they're less helpful for honing your taste, since you won't be able to publish papers like those anymore; their styles are often out of fashion.

**Assist** – Assist your advisor, senior students, and postdocs in your lab on *their* projects. Make yourself as useful of a helper as possible without worrying about taking creative control. The best-case outcome here is that you end up as a [non-lead coauthor](#) on their papers and learn a lot about research methodology and conventions. Assisting also eliminates the *uncertainty* and *isolation* that often paralyze early-stage students.

**Grind** – Even when you start developing good research taste, the early work you produce won't be good. That's okay! As cliched as this sounds, you need to grind hard for years before getting good at anything worthwhile. My favorite [Ira Glass quote](#) beautifully captures this idea:

What nobody tells people who are beginners – and I really wish someone had told this to me ... is that all of us who do creative work, we get into it because we have good taste. But there is this gap. For the first couple years you make stuff, and it's just not that good. It's trying to be good, it has potential, but it's not.

But your taste, the thing that got you into the game, is still killer. And your taste is why your work disappoints you. A lot of people never get past this phase. They quit. Most people I know who do interesting, creative work went through years of this. We know our work doesn't have this special

thing that we want it to have. We all go through this. And if you are just starting out or you are still in this phase, you gotta know it's normal and the most important thing you can do is do a lot of work. Put yourself on a deadline so that every week you will finish one story.

It is only by going through a volume of work that you will close that gap, and your work will be as good as your ambitions. And I took longer to figure out how to do this than anyone I've ever met. It's gonna take awhile. It's normal to take awhile. You've just gotta fight your way through.

Also, read my article [Lessons from the Grind](#) about why grinding is a precursor for creativity. In short, without a **ton** of hard work, you can't even begin to generate original ideas that go beyond the state-of-the-art in your field.

Finally, the sci-fi author William Gibson has a great mini-essay on [developing creative taste](#) as a fiction writer. Here is the concluding paragraph, with me substituting “writing” for “research”:

And therein, I think, lies most of how one learns to do research. We have to learn to do research, but we have already, to varying degrees, had to learn to read research. And I felt like quite a good reader of research, when I began to do research, or at least a good reader of that research which I most keenly enjoyed. And thus are we shaped as researchers, I believe, not so much by who our favorite researchers are as by our general experience of research. Learning to do research, we learn to listen for our own acquired sense of what feels right, based on the totality of the pleasure (or its lack) that research has provided us. Not direct emulation, but rather a matter of a personal micro-culture.

#### MOST OF THE DAILY WORK YOU DO WILL NOT FEEL LIKE RESEARCH

One of the great ironies of Ph.D. student life is that you're supposedly here to do novel research, yet the majority of the time you spend at work will *not feel at all like research*. This is especially true in STEM fields. For instance, you may be spending most of your workdays installing, configuring, and debugging ad-hoc software, writing prototype code, calibrating scientific instruments, fabricating custom materials, wiring up hardware components, feeding and caring for lab animals, performing procedures on lab animals, cleaning up after lab animals, moving live cell cultures from one refrigeration unit to another, or an assortment of other mundane tasks that don't “feel” like research. (Some well-funded labs hire technical staff to handle these tasks, but in practice Ph.D. students are the ones who do them.)

One negative side-effect of spending so much of your time on tasks that don't feel like research is that you may lose sight of the big-picture of *why* you're doing all of these seemingly-mundane tasks, the proverbial “missing the forest for the trees.” It may seem at times that you're spending only a tiny fraction of your time during your Ph.D. contributing to the higher-level big-picture of research. That's a perfectly normal feeling for students across STEM fields. I don't have any advice here except to acknowledge that you're not alone in feeling this way, and that it's still important to pop your head up once in a while to understand the big picture (to see the forest rather than all the trees). However, the reality is that you will be spending the majority of your work days (maybe 90% or more) deep in the weeds of your work to the point where it simply won't feel like research. Be aware that this is bound to happen, but don't lose sight of the big picture of what you're working toward.

#### UNDERSTAND YOUR ADVISOR

Behind that facade of authority, your Ph.D. advisor is a human being with their own needs, wants, and biases. The better you understand your advisor, the smoother your Ph.D. experience will be.

Perhaps the most important question is: Does your advisor have tenure? If not, then their top priority is earning tenure so that they can keep their job. If you work with an untenured advisor, then your work will directly contribute to their tenure case. Thus, untenured advisors are usually more hands-on and provide more structure for their Ph.D. students' careers. Also, untenured advisors are easier to read, since their main professional goal is to build a compelling research portfolio for their tenure case.

If your advisor already has tenure, then they might have varying motivations. Do they want to build up a larger and more ambitious research program? Are they trying to break into a new line of research? Are they now more focused on professional service, advocacy, or teaching? Tenured advisors tend to be a bit more hands-off since their careers aren't as dependent on their Ph.D. students' performance. But of course, there are many tenured advisors who are still just as hungry for success as they were in their younger, untenured years. It's ultimately up to you to gauge their motivations and priorities.

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#### THERE IS NO PERFECT ADVISOR (NOT BY A LONGSHOT!)

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This may seem obvious, but it bears repeating: there is no perfect advisor. No matter how “good” your advisor is, there will always be something more you wish for them to do. If you come into grad school expecting for your advisor to provide a well-paved path for your graduation, then you are going to be in for a rude awakening. People often succeed in their Ph.D. *in spite of* their advisor's imperfections, so you'll need to figure out ways to compensate for what your advisor cannot provide. Getting a Ph.D. requires a tremendous amount of self-initiative, and there's simply no way you can rely on your advisor (or any other person) to carry you to the finish line.

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#### BE REALLY PATIENT

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For a six-year Ph.D. (which is typical for science and engineering programs in the U.S.), what you do in the first three years probably won't count toward your dissertation. Seriously, pretty much every Ph.D. graduate I've spoken with shares this same experience. So be patient.

If you've finished three years and still don't have a dissertation project with published papers under your belt, it's okay. As long as you've been learning to develop good research taste by reading, assisting other people's projects, and trying (and probably failing) to push forward your own projects, then you've set yourself up well for the second half of grad school.

For instance, I started my first successful Ph.D. project at the beginning of my fourth year and didn't get the [paper](#) published until the middle of *my fifth year*.

You will inevitably encounter peers who are “ahead of you” in their Ph.D., publishing more papers and finding success earlier on in grad school. That's okay! It's not a head-to-head competition; there is no class curve. So be patient and march forward every day, one bit at a time.

(Note that if you work with an untenured advisor, then they have a strong vested interest in getting you up to speed and productive as quickly as possible, since they need more publications to build up their tenure case.)



## MAKE PROFESSORS WANT TO HELP YOU

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You can't get good as a researcher without help from professors, but the conundrum is that professors like helping students who are *already good* at research.

If a professor had the choice between spending an hour with an all-star student who is about to submit a strong paper and a naive early-stage student, which meeting would they look forward to? Which meeting would be more fun for them? In general, professors look forward to helping students who, paradoxically, need less help.

Here's an open secret: Professors are neither hired nor promoted based on how well they mentor grad students. Advising quality only matters to the extent that good advising can produce papers, but I've seen plenty of bad advisors successfully crack the whip to churn out papers as well. When I [interviewed for faculty jobs](#), never once did my interviewers ask how I would advise Ph.D. students, or about fostering grad student health in general. In fact, the topic of grad students never came up, except when they were complaining about bad ones. Sadly, those are the students who need the most help but don't know how to get it.

So what's the lesson here? You need to make professors want to help you. Repeat: You need to make professors *want* to help you.

How? One way is by demonstrating that you have impeccable work ethic and great potential for future success, so that they feel like their time is being well spent. Another way is to discover what truly excites them and adapt your interests to theirs. Read my article [Lead From Below](#) for more details on this technique.

If can't make professors want to help you, then they would rather devote their energies to their other students. Heck, even as they're meeting with you, they might be wishing that they were instead hanging out with their all-star student.

(This advice applies to *all jobs*, not just research. The most successful employees are often those who make their bosses or mentors *want* to help them.)

## FIND PEER SUPPORT

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The happiest and most successful Ph.D. students are those who have maintained a strong peer support group throughout grad school. Remember, *isolation* comes by default, so you need to proactively seek out peers for camaraderie. Your department and advisors cannot do much to help, despite their most sincere efforts: Lab lunches and snack breaks are superficial patches and don't do much to eliminate the endemic feelings of isolation. So seek strength from your peers, not from your senior colleagues. (However, be careful not to surround yourself with peers who are a negative influence on you, such as students who are overly cynical and refuse to put in the necessary work; those students will drag you down [crabs-in-a-bucket style](#).)

## AVOID INFECTIOUS NEGATIVITY

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Negativity is infectious. I understand that there will be times when you feel negative about research, teaching, or academia in general (especially when your papers get rejected!). Trust me, I've gone through plenty of those low times myself!

Don't be a student who infects others with negativity. In the challenging world of academic research, positivity is so precious and so easily overtaken by infectious negativity. Don't unravel the hard work that your fellow grad students undergo to maintain their positivity in the presence of the many challenges that they're facing.



Likewise, be very careful about hanging around students who are infectiously negative. It is really easy for those vibes to rub off on you. (This also includes “hanging out” in bad online spaces too ... certain kinds of discussion forums and social media groups are cesspools of unfettered negativity.)

### BE CAREFUL ABOUT GETTING ADVICE FROM SENIOR STUDENTS, ESPECIALLY THOSE OUTSIDE OF YOUR AREA

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Senior Ph.D. students often have very different concerns than early-stage students like yourself. So even if they are well-meaning, their advice may not apply directly to you. This is especially true for senior students who are outside of your own research area. So be careful about taking advice from students in different areas, not because it's necessarily “bad” advice but more because details vary so much by area in academia.

(Taken to the extreme, I would strongly advise *against* reading online student forums for advice, since the students who post on there are from all sorts of different areas and are usually more infectiously negative.)

That said, I think where senior Ph.D. students can give the **best advice** is giving you insights on ways to interact with your own advisor or with related professors in your research area. So definitely talk candidly with your labmates, groupmates, and other area colleagues about how to best interact with faculty in your area; that is very valuable information!

### UNDERSTAND YOUR JOB

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The happiest and most successful Ph.D. students understand that **this is a job**, albeit a unique one with different expectations than industry jobs. The most angst-ridden students still think of the Ph.D. experience as an extended form of school and a shelter from getting a “real job.” Well, this is a job! I've noticed that students with a few years of industry experience generally have a better time in grad school than those who came straight from college. This is a massive over-generalization, though. Counterexamples abound on both sides. *[Update in Jan 2021: as a counterpoint, some students who are coming from industry treat it TOO MUCH like a job where they just want a boss telling them what to do day-to-day. That's not good either. You need to take much more ownership of your Ph.D. projects than in industry jobs, since your advisor isn't a traditional industry “boss.”]*

So what exactly is your job? To publish high-quality academic papers that contribute valuable new knowledge to your field. Read this for more details: [A mid-timer's thoughts on publishing academic papers](#)

In most science and engineering fields, students are funded by their advisors' grants, which stipulate specific projects or research directions that they must work on. As a student, your funding source, advisor's expectations, and the current tastes of the research community all dictate what kind of work you can potentially do. You don't have total freedom; but then again, nobody does. Once you've internalized your role at this job, then you can figure out ways to be creative within those constraints.

Also, I highly recommend spending a summer or two [interning at a company](#) during grad school, especially in a non-research role. Internships not only help you understand how projects get done with much shorter time horizons than research projects, but also help you develop skills that are useful outside of academia. *[I know this isn't standard practice in all fields, but it is in mine.]*

## MAKE YOURSELF ACCOUNTABLE

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Here's one major difference between industry and academia:

- In industry, you are usually working closely with a team and given concrete tasks with weekly and sometimes even daily deliverables. You know exactly what you need to do when you get to work every day. You feel directly accountable to your coworkers and boss since they're depending on you to do your part.
- In academia, you are usually working alone on your own research and do not have concrete day-to-day deliverables that you must complete. Of course, your advisor or senior colleagues might be relying on you to get stuff done, but the pressure isn't on a daily basis. So you're not accountable to anyone day-to-day.

Thus, it's much easier to slip through the cracks in academia because you are often not on anybody's critical path. (By *critical path* I mean the path of work that is critical for their career advancement.) Your advisor is juggling 100 other tasks at any given moment; so if you have an unproductive few days or weeks, nobody will likely notice. The one notable exception is if you have a untenured advisor who needs your project as part of their tenure case; then by definition you are on their critical path to earning tenure.

Also, research is inherently less concrete than industry work, so it's harder to track daily progress. If you're not performing up to par in industry, your teammates notice immediately and will figure out some way to get you back on track ... or get you fired. After all, their careers are depending on you, so they can't afford to have you drag along as dead weight. In contrast, as a grad student, if you're in a slump for a few weeks, your advisor might not notice if they're busy juggling 100 other tasks.

One hack is to find ways to **make yourself accountable** to other people, thereby simulating this desirable aspect of industry jobs. If you can tie your success directly to someone else's, then they will be more likely to keep you on track and making consistent progress toward your mutual goals. The most common case here is working with a senior student or postdoc so that your project is a component of their larger project; that way, their success is tied to yours. And more broadly, working with an untenured advisor makes you accountable too, since their tenure case is tied to your work.

Here are some other ways to create accountability for yourself:

- Schedule yourself to give a talk at an upcoming lab meeting, or even better, at someone *else's* lab meeting. That way, you'll be forced to make some amount of progress and put together a solid presentation by a deadline. You probably won't want to cancel or give a bad talk, since that risks embarrassing yourself; that's positive motivation to do a good job!
- Schedule one-on-one meetings with people throughout the year to get feedback on your research (not only your advisor ... look broadly for anyone who will listen ... as a bonus, more people will know about your work!). Those meetings are mini-deadlines to force you to make some amount of progress so that you'll have good questions to ask. You won't want to let others down by coming in unprepared.
- If you work on software-related projects, try to get a few actual users for your software, likely within your own department. If you can get real users (even just one!), then you're now accountable to them and won't want to let them down. Of course, they know that your software is just a prototype, but still, having even one user creates infinitely more accountability than no users.
- If your advisor needs to give an important talk to, say, funding agencies or to their professional colleagues, ask them if they want to show off your research in their talk. If they do, then you're now held accountable for making enough progress so that they have something cool to show.

Details will vary depending on what kind of research you do, but the idea remains the same: By default there's little day-to-day accountability in a Ph.D. program, so you need to take the initiative to create accountability for yourself.

## DEVELOP A FIXED WORK SCHEDULE

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Related to [Make Yourself Accountable](#), another thing that really helps Ph.D. students maintain focus is developing a fixed work schedule that you can easily follow each and every week. This schedule will differ depending on your type of work, but here I'm assuming that your research involves working on your computer and not being in a physical lab or field site. Here's an example schedule:

Weekdays (Monday–Friday):

- **8-11am** – Work on your research for an uninterrupted block of time in the morning before you have any classes, meetings, etc. Ideally do this at home or a nearby coffee shop before going to campus so you can get started flowing right away without a commute and without anyone distracting you. Yes, this will require you to wake up before grad students typically do, so deal with it!
- **11am-6pm** – Go into campus to do everything else. For early-stage students, this means attending classes, doing class-related work (but see the section on [Stop Caring About Classes](#)), lab meetings, advisor meetings, research talks, exercise, impromptu socializing, and all other activities that aren't your main research. If you get distracted then, that's OK since you've already gotten your 8-11am solo research time done for the day, so you've already won. Try to stay in work-mode throughout the afternoon, but if something else comes up or if you want to nap, then you can relax guilt-free knowing that you've done your 8-11am already.
- **Evenings** – Do whatever you want, but don't feel compelled to keep working more on research since you need to rest up your brain before the next day's critical 8-11am work session. So take your evenings off, guilt-free. Otherwise you risk getting *burned out* from non-stop work. That said, during paper deadlines you may have to do research into the evenings. And if you have class work due soon you may have to crunch at night too (but again, if you're optimizing for your class grades then your [priorities are misplaced](#) ... just do what you need to pass).

Weekend (Saturday–Sunday):

- Find a 3-hour block sometime in the day to work solo on your research at home or in a coffee shop, or maybe in the office if you like your computer setup there (since nobody will be there to distract you). I'd personally stick with the 8-11am block as a matter of consistency, but if you want to go out to have fun in the morning, then no problem – just shift that 3-hour block to later in the day.
- Again, early-on you will likely have class-related homework to do on weekends, but always do that *after* getting your 3-hour research time in. You may also have TA work to do on weekends, but again do that after your research. Remember, always prioritize research over classes, TA-ing, or anything else.

The most important thing is to ***always do your research work before any other work*** in your day, since that's when your mind is the freshest. Here's a relevant excerpt from [The Daily Routines of 12 Famous Writers](#):

**Do the most important thing first.** Notice how many excellent writers start writing in the morning? That's no coincidence. They work on their goals before the rest of the day gets out of control. They aren't wondering when they're going to write and they aren't battling to “fit it in” amongst their daily activities because they are doing the most important thing first.

As a Ph.D. student, your research is the most important thing for your career, so make some progress on it as the first thing each day (e.g., 8-11am) before your day inevitably spirals out of control with other obligations or distractions.

It doesn't matter how much progress you make on research each morning, the most important thing is that you SIT DOWN AND TRY. As Jerry Seinfeld says, [Don't break the chain](#). (i.e., don't ever skip a day!) Most days will feel like a slow slog, but some rare days will feel amazing. But you gotta keep trying every day.

### DO EVERYTHING YOU CAN TO PROTECT YOUR MORNINGS

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Once you establish a [fixed work schedule](#), protect your Monday–Friday 8-11am research time as much as you can. Otherwise since it's all too easy to let this slip because nobody is “forcing” you to stay on that schedule. For example:

- Make it crystal-clear to friends and family that being a Ph.D. student is like a 9-to-5 “office job” that many of them have. Thus, they should never interrupt you Monday–Friday during work hours unless it's an emergency. Otherwise it's easy for boundaries to slip since your friends and family may think that you're still a “student” so your schedule is flexible. Set a firm expectation that you're especially unavailable from 8-11am, so if they need something from you, it will have to wait until the afternoon at best.
- Sometimes you will have classes scheduled before 11am, which is non-ideal. Try as much as possible not to have morning classes, and if you really can't avoid them, then consider skipping lectures and watching the video recordings later. Yes, I know it's not an ideal experience, but again you need to [optimize for research progress over class performance](#). A 10am class may be OK ... you'll either have to wake up much earlier on those days or take a big hit and do 8-9:30am (to account for a half-hour commute time). And definitely avoid 8am or 9am classes.
- Another annoying thing is if your advisor schedules weekly lab/group meetings in your sacred 8-11am slot. It's not a good idea to skip lab meetings (so you probably need to attend), but here's an email template to try to push back here:

Hi <inconsiderate advisor who scheduled without asking me>,

I just saw that lab meetings this semester are Wednesdays at 10am. If there's any way to schedule it at 11am or after, I'd really appreciate it. As a matter of personal discipline, I block off 8-11am every morning to make focused progress on research so that I can contribute most effectively to our lab's work. (I believe some other students may have classes or other obligations to attend to at Wednesdays 10am as well.)

If lab meetings really can't be rescheduled this term, then I totally understand and will attend each week at 10am. As a new student in the lab, I don't want to appear too demanding, but my 8-11am research times are critical for me to contribute best to the lab. I'd appreciate it if in future semesters we could discuss lab meeting scheduling farther in advance.

Thanks,  
<super-scared grad student hoping you won't hate me now>

- Finally, some of the hardest distractions to turn down are when senior colleagues who have power over you (e.g., your advisor or other professors) ask you to come to random meetings scheduled in your sacred 8-11am block. It can feel scary to push back here, but if done tactfully they will respect you more since you're asserting firm boundaries. Here's an example email template you can use:

Hi <scary senior colleague>,

Thanks for including me in <boring meeting you're forcing me to attend against my will>. If there's any way to schedule it after 11am (or before 8am), I'd really appreciate it. As a matter of personal discipline, I block off 8-11am every morning to make focused progress on my research.

If the meeting can't be rescheduled, then sorry I might not be able to make it. But I'm happy to do extra work to contribute to this effort asynchronously, such as <alternate work before or after meeting>.

Of course, if it's absolutely critical that I attend the meeting at this time, then please let me know and I totally understand; some one-time events shouldn't be skipped. But thanks in advance for your consideration of my scheduling preferences. I would like to help out however I can.

<super-scared grad student hoping you won't hate me now>

If you assert your 8-11am boundaries, you'll find that lots of meetings aren't truly critical for you to attend ... senior people schedule all sorts of f-ing useless meetings, so if you just push back a bit, they might be like *"Oh yeah don't worry about it, you should definitely focus on your research! I wish I could be as disciplined as you!"* Seriously, people will respect you more for politely enforcing your boundaries.

Again, the key is to communicate to everyone that you have strict 8-11am boundaries. It may well be that your advisor says "ok I get where you're coming from, but you REALLY NEED to come to this meeting since an important funder is here tomorrow morning, and they want to see your demo" in which case you should obviously back down and attend. But at least your advisor *knows* that they're poking into your protected time, so they understand that you've made a sacrifice to be there for this one-time meeting. If you don't communicate scheduling boundaries at all out of fear, then they will assume that you don't have any.

Politely but consistently asserting your boundaries can win you respect as a junior colleague who is a future *peer* of these super-scary-senior-people, not as some subordinate whom they can just push around at will.

(Ideally you'd also assert boundaries like no meetings on nights or weekends. But for starters, 8-11am is the most important since that's your protected personal research time. You may not feel comfortable being too demanding up-front.)

## POLITELY TURN DOWN VOLUNTEER SERVICE WORK REQUESTS

Academia is a ["gift economy."](#) What this means is that everyone volunteers as a "gift" to one another to keep the academic community running. Without massive amounts of volunteering, academia would completely collapse. Locally at your university, this may mean volunteering to organize research group meetings, invited talks, special social events, or department seminars, and maybe showing visitors around campus. Beyond your university, people volunteer to organize conferences, workshops, mentoring events, and social events, to write reference letters, and to manage the entire peer-reviewed publication process. This sort of volunteer work is called "service work" – work done as a service to your professional community.

We all should pitch in to do service work to keep our community healthy and to be **good citizens** in our field; it's the right thing to do! That said, it's also important not to be saddled with too much service work when you're a new Ph.D. student trying to get your research off the ground. Unfortunately, shit always rolls downhill (Newton's Fourth [Law of Motion](#)) so students often bear the brunt of the most tedious service work. And it can be hard to fend off these requests because, by definition, they come from more senior and powerful colleagues. Even worse, some types of students (e.g., those in underrepresented groups) are often asked to do

more than their fair share of service work. To counteract these forces, I'll give some email templates here to help you push back even when you're feeling powerless.

OK first things first, if someone approaches you in-person with a service work request, here's what you say:

- “Thanks for thinking of me. Let me go home, double-check my schedule, and talk to my advisor about it during our next meeting. Then I'll get back to you by email in the next few days.”
- [if it's your advisor asking] “Thanks for thinking of me. Let me go home, double-check my schedule, and get back to you by email in the next few days.”

Never agree to a request there in-person! Stalling buys you time to craft a good email response. It's much easier to say No via email than to say it verbally to someone's face. OK, here are some email templates you can use (regardless of whether someone asked you to do service work in-person or via email).

If this person is outside of your department, then you really have no obligation to them whatsoever, so you can reply with something like:

Hi <scary senior colleague from outside my department>,

Thanks for inviting me to <do this time-consuming service task that has absolutely no benefit for my career>. I've given your request a lot of thought over the past few days and also talked to my advisor about it.

Even though I'd love to help out right now, my advisor and I decided that it's critical for me to focus on my research toward this coming deadline <e.g., a paper submission or thesis proposal or whatever>. We're struggling with a really hard part of the problem right now and starting to make some headway, so we'd like to focus deeply on it in the coming weeks.

If you'd like me to recommend some other students <to throw under the bus for your task>, just let me know. Or please email me back next time around if you think I can be of help later when my schedule is more clear.

Best wishes with your initiative,  
<super-scared grad student hoping you won't hate me now>

The key idea to realize here is that ***they probably don't care WHO does this service work they're trying to pass off ... they just need somebody to do it.*** They asked you since your name popped into their head, but they're fine with some other grad student doing it. It doesn't have to be you.

And whatever you do, do NOT accept a meeting with them to chat about their request. Once you agree to a meeting, then they have home-court advantage and can pressure you into saying Yes. Email is your best defense.

Now if this person is inside your department, especially if they're in your research area and might be on your dissertation committee, then you need to tread more carefully. It's harder to say No to someone who's closer to you. Example template:

Hi <scary professor who might be on my future committee>,

Thanks for inviting me to <do this time-consuming service task that has absolutely no benefit for my career>. I've given your request a lot of thought over the past few days and also talked to my advisor about it.

Even though I'd love to help out right now, my advisor and I decided that it's critical for me to focus on my research toward this coming deadline <e.g., a paper submission or thesis proposal or whatever>. We're

struggling with a really hard part of the problem right now and starting to make some headway, so we'd like to focus deeply on it in the coming weeks.

Of course, I recognize that it's important for all grad students to pitch in to help run department / lab events, so I am happy to accept this task if you think I'm best-suited to do it. Perhaps you can talk to my advisor about it?

Thanks,  
<super-scared grad student hoping you won't hate me now>

Finally, the hardest person to turn down is your own advisor, so you may not win these battles. But it's still good to state your case:

Hi <advisor whom I'm mortally afraid of>,

Thanks for inviting me to <do this time-consuming service task that has absolutely no benefit for my career>. I've given your request a lot of thought over the past few days.

Even though I'd love to help out right now, I'd really like to focus on my research toward this coming deadline <e.g., a paper submission or thesis proposal or whatever>. I'm struggling with a really hard part of the problem right now and starting to make some headway, so I'd like to focus deeply on it in the coming weeks.

That said, I know how important it is to be a good lab citizen and do my fair share of service, since everyone else is pitching in too. So if you feel this task is a meaningful use of my time, then of course I'll do it for you.

Thanks,  
<super-scared grad student hoping you won't hate me now>

P.S. From talking to my labmates, I noticed that some of us are asked to do more service than others, so perhaps we can talk at our next one-on-one meeting about how to more evenly distribute service work across all students in the lab? I just want us all to do our fair share.

With an email like this, even if you have to accept the service request (since it's very hard to say *No* to your own advisor), at least they will know that you'd like to push back. In the end, they get what they want – you're doing the service work they asked for. And you also get (part of) what you want – you let your advisor know that you have some boundaries, so hopefully they will be more considerate in the future.

Of course, don't B.S. your advisor – if you turn down their service request, you had better be making good progress on your research and not just slacking off!

***Again, I'm not saying that you should turn down ALL service requests ... since if everyone turned down all requests, then academia would collapse. We all need to do service to pitch in (heck, I've done a lot of service over the years!) ... but the important thing is that you feel like you're doing your fair share instead of being unfairly exploited.***

There are good reasons to say *Yes* to service work – because it's fun or fulfilling, because you get to learn a new skill, because you get to meet new people, because you owe your friend a favor for helping you out earlier, or because your labmates have all pitched in already so it's only fair that you do too.

OK, so what if you either can't turn down a service request or actually want to do it? Here are some guidelines:

- Never do it in your 8-11am research time. Always prioritize research over service.



- Figure out what it means to do a “good enough” job and put in that amount of effort. You're not obligated to do any more than this. Most service work doesn't need to be done exceptionally well, it just needs to get DONE period. So often the bar for completion isn't that high. Just do it and move on. Nobody's gonna hire you as a researcher for being exceptional at service work.
- That said, always respect deadlines if you agree to a service request. Other people are depending on you to get something done by a certain date, so keep that promise! If it's a matter of doing an 80%-quality job and getting it done on time, versus doing a 95%-quality job but being late, choose 80% but on-time. Always.

### PUSHING BACK AGAINST PROFESSORS WHO OVERWORK YOU AS A TA

Aside from doing [volunteer service work](#), if you need to TA for funding then that work can eat up a lot of your time without benefiting your research. Once again, similar guidelines apply, so I'll repeat them here:

- Never do it in your 8-11am research time. Always prioritize research over TA work.
- Figure out what it means to do a “good enough” job and put in that amount of effort. You're not obligated to do any more than this. Most TA work doesn't need to be done exceptionally well, it just needs to get DONE period. So often the bar for completion isn't that high. Just do it and move on. Nobody's gonna hire you as a researcher for being exceptional at TA-ing.
- That said, always respect deadlines, since the professor and your students are relying on you to do your duties on time. If it's a matter of doing an 80%-quality job and getting it done on time, versus doing a 95%-quality job but being late, choose 80% but on-time. Always.

Ideally you would TA for your own advisor so that they can protect you against overwork (if they're nice!). However, if you're TA-ing for another professor, then your fate is in their hands. Some professors are reasonable, while others are notorious for overworking their TAs. Before applying for TAs, ask previous TAs to see how particular professors are, and try to avoid ones that overwork their TAs. That's the best solution. But if you're stuck in a bad situation with an unfair professor, then you've got to push back and protect your time. ***If you don't proactively protect your time, then your research progress will suffer.***

Here's an example email template:

Hi <terrible professor who overworks their TAs>,

I've been tracking my work hours for the past few weeks and noticed that I'm consistently putting in over 30 hours per week on TA work for you class. Our TA contract says we should be working 20 hours per week.

I understand these time guidelines are probably flexible and situation-dependent, so I'd like to meet with you to talk about how I can streamline my work to be more efficient. I want to do the best job for you and the students while staying within the allotted 20 hours per week.

I've documented in detail what I'm spending time on each week for your class, so if we review my logs together then you can probably give me some good advice about how to work more efficiently as a TA.

Thanks,  
<super-scared grad student hoping you won't hate me now>

If your advisor is more senior/powerful than the professor you're TA-ing for, then you can also lean on your advisor to muscle in. After all, part of your advisor's job is

to protect their students from unfair exploitation. Maybe add an extra Godfather-style line to your email saying something like:

P.S. I've gone over my TA work hours log with my advisor, and they also feel that parts could probably be streamlined. Would you be OK with my advisor sitting in on our meeting when we discuss this issue? Thanks!

This is the nuclear option, though, so be very careful about deploying it due to possible backlash :) For instance, if your advisor is junior, then they might be scared to step in head-to-head against a senior professor, so don't press them too hard.

Regardless, nobody will care about what this professor thought of you as a TA ... it won't affect your career either way. So do a good-enough job, get paid, and move on.

### KEEP MOVING

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If you're actively working on a project (i.e., not on vacation) and spend more than a few days not doing anything *concrete* related to it, then you're stuck. It's critical that you talk to your advisor or another mentor ***immediately*** so that they can help you get unstuck ASAP. There's no shame in being stuck; it happens to everyone. It's your advisor's job to get you unstuck.

Joel Spolsky's [Fire And Motion](#) eloquently sums up the philosophy of *keep moving*:

In infantry battles, [the general] told us, there is only one strategy: Fire and Motion. You move towards the enemy while firing your weapon. The firing forces him to keep his head down so he can't fire at you. (That's what the soldiers mean when they shout "cover me." It means, "fire at our enemy so he has to duck and can't fire at me while I run across this street, here." It works.) The motion allows you to conquer territory and get closer to your enemy, where your shots are much more likely to hit their target. If you're not moving, the enemy gets to decide what happens, which is not a good thing. If you're not firing, the enemy will fire at you, pinning you down.

And Michael Nielsen in [Principles of Effective Research](#):

In my opinion, there is little that is more important in research than building forward momentum. Being clear about some goal, even if that goal is the wrong goal, or the clarity is illusory, is tremendously powerful. For the most part, it's better to be doing something, rather than nothing, *provided*, of course, that you set time aside frequently for reflection and reconsideration of your goals. Much of the time in research is spent in a fog, and taking the time to set clear goals can really help lift the fog.

Jerry Seinfeld's famous "[don't break the chain](#)" tip is relevant here too:

He revealed a unique calendar system he uses to pressure himself to write. Here's how it works.

He told me to get a big wall calendar that has a whole year on one page and hang it on a prominent wall. The next step was to get a big red magic marker.

He said for each day that I do my task of writing, I get to put a big red X over that day. "After a few days you'll have a chain. Just keep at it and the chain will grow longer every day. You'll like seeing that chain, especially when you get a few weeks under your belt. Your only job next is to not break the chain."

"Don't break the chain," he said again for emphasis.

Over the years I've used his technique in many different areas. I've used it for exercise, to learn programming, to learn network administration, to build successful websites and build successful businesses.

It works because it isn't the one-shot pushes that get us where we want to go, it is the consistent daily action that builds extraordinary outcomes. You may have heard "inch by inch anything's a cinch." Inch by inch does work if you can move an inch every day.

Daily action builds habits. It gives you practice and will make you an expert in a short time. If you don't break the chain, you'll start to spot opportunities you otherwise wouldn't. Small improvements accumulate into large improvements rapidly because daily action provides "compounding interest."

Skipping one day makes it easier to skip the next.

Why is having a daily habit of working on research (even a small amount at times when you're less motivated) so so so so so important? Because it gets your mind to constantly be immersed in your problem so that even when you're away from work (e.g., taking breaks, hanging out with friends, having fun outside of work), ***your subconscious mind is still busy churning away at the problem in the background and working on your behalf!!!*** Then you will be more likely to have those surprise Eureka moments when a new discovery or revelation seems to pop into your head as if by magic ... but there's no magic, it's just that you've been immersed so deeply in a problem for days, weeks, months, or even years, so you're more likely to come up with insights that your peers who aren't immersed simply won't ever be able to. You don't necessarily need to be "smarter" or more "intelligent" than your peers (whatever those vague terms may mean) ... if you can stay more deeply immersed for longer, that can be far far far more powerful in the long run.

Many Ph.D. students fail not because they're not smart or hardworking, but because they *get stuck* for extended periods of time and then grow demoralized. Keep moving.

See this talk for more details: [Advice for first-year Ph.D. students](https://archive.ph/2023.12.14-131020/https://pg.ucsd.edu/early-stage-PhD-advice.htm#selection-4705.286-4717.40). Here are some relevant excerpts from the talk:

*Part 1: The One-Dimensional Model of Research*

Advice for First-Year Ph.D. Students...



*Part 2: The N-Dimensional Model of Research*

## Advice for First-Year Ph.D. Students...



### AVOID THE DREADED LOOP OF DESPAIR

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Related to [Keep Moving](#) (see above), you want to avoid getting stuck and falling into this dreaded loop of despair:

- You get stuck on something critical for your research but don't want to bother your advisor or other labmates. After all, your advisor seems REALLY BUSY ALL THE TIME! So you don't want to take up their precious time. And you don't want to admit to your labmates that you're stuck since they might think less of you.
- So you keep trying and trying by yourself but get stuck even more.
- You end up procrastinating and wanting to avoid going back to that specific task since it seems so daunting; you fill up your time with easier but less critical tasks to make yourself still feel productive.
- By now more time has passed (maybe a week or two) and you're even *more afraid* to approach your advisor for help because they might be like “Why didn't you come to me earlier?!?” and you want to really avoid that awkward conversation.
  - You're also afraid that they will think less of you since you haven't made that much visible progress. You won't have that much to show at the meeting, so maybe you should just wait it out longer and have more to show next week?!?
- So you dive deeper into procrastination and avoidance, next week comes and goes, and you still have nothing more to show.
- By now even more time has passed (maybe a month or more) and there's no possible way you can tell your advisor now since it seems way too shameful.
- Now your advisor is wondering what you've been up to for the past month or two, since whenever they check in with you, you seem to be doing OK because you just nod and smile, but you never brought up the critical issue you've been stuck on.
- etc. etc. etc.
- *[this is often how Ph.D. students fail out]*

Avoid this loop by asking for serious help whenever you've been stuck on something for one week at most! If your advisor isn't available, grab a senior student, postdoc, or other colleague ASAP. Don't be ashamed to ask for help. Yes, it's important to try to figure things out yourself, but after a few days of being stuck, it's important to get help ASAP or else you'll risk falling into this loop of despair.

### EVERYONE IS BUSY, BUT ASK THEM FOR HELP ANYWAYS

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Related to the “dreaded loop of despair” point above, you'll find that the people who may be able to provide the best help to get you unstuck are often the most busy ones. (And conversely, the ones who are the most free to shoot the breeze anytime are probably not the most helpful.) Don't be afraid of bugging busy people (within reason, of course!) ... if you show genuine effort and care in your work, then even

super-busy people will empathize and want to help you out. It may take a while to schedule meetings with super-busy people, but keep at it.

Don't be afraid of wasting people's time or being a bother to them. If you've shown genuine effort and a desire to improve, then you're not wasting anyone's time.

Once you do get a meeting, have the confidence to ask for what you need ... come prepared with a set of questions or even requests for follow-up actions. Again, if you've shown genuine effort, then people will be willing to help if it fits into their schedule. If you don't ask, then you're never going to get what you want or need.

The worst-case scenario is to retreat in isolation for long stretches of time when you're stuck, since the longer you're in a rut the harder it is to dig yourself out.

### MY MAIN TIP FOR HAVING PRODUCTIVE MEETINGS WITH YOUR ADVISOR

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Bring something **concrete** to talk about at every meeting with your advisor! It's that simple. Watch this six-minute video for details:

Advice for First-Year Ph.D. Students...



(Source: [Advice for first-year Ph.D. students](#))

### MANAGING YOUR ADVISOR (PODCAST EXCERPT FROM 2021)

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Here's a very relevant podcast excerpt from April 2021: [The Effort Report, Ep. 136 - Entrepreneurialism](#). The excerpt starts at 1:14 and ends at 7:23.

Here is a transcript of this excerpt, which I've edited, condensed, and paraphrased. Elizabeth and Roger are both senior faculty who have worked with many students ...

*Elizabeth:* So I saw this thread on Twitter that talks about “managing up.” He said, “I told one of my research staff that you have to treat any busy manager like a hyperactive toddler who needs clear and constant instructions and reminders – especially professors.”

He means that if you work for someone and you're trying to get stuff done, you'll be more effective if you're able to manage up. I think that's very confusing, especially if you're new to an academic environment. It may be tempting to say, “Well, I sent an email [to some professor] two weeks ago and no one replied to me.” And then have that be the end. For the majority of faculty I know, it requires, unfortunately, a lot of energy and sending follow-up emails to remind them of things. I don't know any faculty that are offended by those follow-up emails.

Follow-up email is just one example of managing up, but it's the principle of it, which is that if you need to get something done, **you have to manage your boss**

***to get from them what you need in order to accomplish whatever is in front of you.*** And it's a bummer, but I find that to be the case with many faculty.

*Roger:* I think the “up” part is a little misleading. To me it's more about managing in general. One of the things that's hard to get if you're a student or postdoc, and you're working with a faculty advisor, is you tend to think of the professor as being just like a really experienced version of you ... what you hope to be 10 or 20 years from now.

That may be true, but managing is trying to get out of people what they're the best at. It's true your advisor is good at the science, or whatever it is you're doing, but the thing that makes them your advisor – what they're best at – is ***making decisions that balance trade-offs you don't even understand yet***. If you can get a decision or even help on a decision out of your advisor, then that's leveraging their skills ... that's leveraging the kind of unique thing that your advisor is good at.

*Elizabeth:* Can you make up a hypothetical example?

*Roger:* I think what he's saying in the Twitter thread is that you need to structure the conversation in terms of decisions. If you have a question, it's more efficient to pitch it as like, ***there's a small number of choices and I need help figuring out which one to take***. Not open-ended like, “Here's my current paper draft. What do you think?” It should be like, “Here's my paper draft, I'm having trouble with this one section. I don't know if I should include one statistical model, three models, or ten models.” And your advisor will be like, “Well, look, given the nature of the journal that we're submitting to, and I know that readers expect this, and that's the nature of this result, it requires sensitivity analysis [a mathematical technique]. So we should do ten models.” That kind of experience is what you're leveraging when you talk to an advisor. But in order to get that out of them, you need to phrase it in a way that's like, “Here's a few choices I'm considering.”

*Elizabeth:* And that's easier said than done.

*Roger:* I agree. I'm not saying it's easy, but I think this is the gist of it. It doesn't matter if it's managing up or down. It's just how to most efficiently make use of someone's time.

*Elizabeth:* The reason the word “up” is helpful is because people are afraid to manage up. Or they don't even understand that it's a concept because they're like, “Oh this is my advisor. Why would I be managing her?” And so I think the word “up” is helpful in clarifying that management goes up too.

## MOVING FORWARD EVEN WHEN YOUR ADVISOR IS UNAVAILABLE

One trait that separates highly-effective Ph.D. students from everyone else is how well they can *make forward progress* (i.e., [keep moving](#)) even when their advisor is (sometimes-unexpectedly) unavailable. Ideally an advisor would always be there to help their students get unstuck, reduce uncertainty in project scoping, and provide clarity on what to do as an immediate next step. But oftentimes advisors are unavailable for one reason or another, and those times are the true test of whether a student can make meaningful progress as a semi-independent researcher ... when these situations arise, Ph.D. students either: a) fall back on doing the familiar (e.g., editing a draft of an old paper section or re-organizing their old notes instead of moving onto writing a new one), or b) intrepidly move forward (e.g., writing a draft of a new paper section) even knowing full well that the direction may not be perfect and might need to be revised later. Strive to be in the latter category. For more details about this idea along with a super-concrete example, [listen to my 6.5-minute audio note](#) (recorded: 2023-08-21)

CONTACT HOURS

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Excerpt from a July 2020 email that I sent to my own mid-stage Ph.D. students:

*welcome to my TED talk ... basically at this point you're all well-positioned to innovate in a particular area, and i've been thinking of what personal "metrics" you could have for day-to-day success (since external metrics like getting a paper published or winning awards are so long-term, uncertain, and due to forces way outside of your control). and the one thing i could come up with is simply "number of contact hours with your core research." teachers (especially in K-12) have this concept of "contact hours" in the classroom where they're directly interacting with students. that is, they can read all the literature about pedagogy they want, prep all their course materials as polished as they can, or talk with other teachers about their experiences (which can all be helpful prerequisites!), but nothing replaces the sheer number of hours they spend in the classroom with students. that's where they truly get a sense of classroom dynamics, reading the room, knowing which students are doing well or need help, etc., all of that [tacit knowledge](#). i'm sure experts in other fields have similar concepts, like pilots with # contact hours in the simulators and in real-life flying.*

*if you want a long-term career in research (whether in academia or industry), i think that relying on external metrics like publications, awards, promotions, etc. isn't sufficient since they only come about once or twice per year at most (in the best case!) and are dependent on many factors outside of your control. pretty much the only thing in your control is your # of contact hours with your core work every day. i'd go as far as to say if you really want to track something, track:*

- *# of contact hours you've had with your core work*
- *how often you meet with your advisor to reflect DEEPLY on the time you spent with your core work (i guess that's "# of contact hours with your advisor")*

*i would bet that those numbers are very strongly correlated with ultimate success. and the intuition here is that contact hours directly translate into you building up [tacit knowledge](#) about the specific area you're working on, which brings you ever-so-slightly [closer to the frontier](#) and also separates you from the pack of other people who might be working on similar things.*

*by putting in a non-trivial number of contact hours, that's how you break away from the pack of other people who might think of similar ideas as you. they can be interested in the topic, but if they're brainstorming shallowly without those contact hours under their belt that you do, then they'll NEVER be able to come up with the leaps of insight necessary for substantial research innovations.*

*... and the real kicker is that when you put in those contact hours, most of the time it will FEEL like you're doing something trivial and uninteresting, like coding up something, hooking up software APIs, cleaning data, etc., but if your mind is open to being "in the zone" you'll absorb the tacit knowledge about your domain by doing so. and then by meeting with others to reflect on what you did, that will deepen your knowledge. then you'll get to the point where the next step always seems "obvious," but those steps aren't obvious to other people who haven't put in those hours that you have. and that will be your critical advantage!!!*

*now comes the part where people might ask for numbers ... how many hours is "enough"? in steady-state without any impending deadlines, i think 3-4 solid contact hours per day, most days of the week, plus 1-2 advisor meetings per week is optimal. so there's absolutely no need to lose sleep or to neglect your health!*

*thanks for coming to my TED talk.*



Related video: [reframe from goals to actions](#)

## MY PROJECT STINKS ... SHOULD I QUIT AND FIND SOMETHING ELSE?

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This is a really hard question to answer, but it's also very important. Basically, *when to quit and when to grit*? In other words, when should you cut your losses and quit, and when should you grit it out for a bit longer in the hopes of getting better results?

- Quitting too early and switching projects/advisors too often means that you never build traction on anything. Also, it can be hard to keep switching because people will trust you less and less if you develop as a reputation as someone who quits at the first sign of difficulty. Pretty soon nobody will want to work with you.
- On the flip side, staying with a doomed project for too long can cost you massively in terms of morale, mental health, and opportunity cost since you could've been working on something else more promising. And the deeper you dive into an unpromising area, the harder it will be to dig yourself out later.

There's no hard-and-fast rule for when to quit a project. But here are some ideas:

- Stick with it for at least 3 months, maybe 6 or 9. Even in fast-moving fields, it's still impossible to get anything reasonable done in less than 3 months.
- Stick with it long enough for you to earn authorship credit on a paper submission, which is again at least 3–6 months. If that's your own first-author paper, then work hard toward submitting *something*, even if it's not your best work. If you're a non-first-author, then do enough so that the first author feels comfortable including you as a coauthor. That way, even after you quit, you can still potentially add one more publication to your CV from your efforts.
- If you decide to quit a project and switch to another one, try to *pivot* to one where the skills and expertise you've gained from the prior project can give you an advantage on your next project. Otherwise you'll risk just bouncing around from project to project without having developed any transferrable skills.
- Related to above, even a failed project that you walk away from is valuable **if you've built up some new skills or expertise** that you can apply to future projects. So that means you should stick with a project for long enough to gain some skills from it before jumping ship. It also means that you didn't really “lose” much from working on that failed project, since you've gained new skills that will make you more effective in the future.
- It's easier to quit and switch near the beginning of your Ph.D., as long as you can find another project or advisor that's a good fit for your skills. It's much harder to switch later on. So if you seem to be stuck for a year or more on something unpromising, try to switch, or else you risk getting stuck for much longer.

## WRITING PAPERS

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As if *doing* the actual research weren't hard enough, ultimately you need to write up your research in the form of paper submissions to [run the gauntlet](#) of peer review.

I won't try to give any paper-writing advice here, but this article encapsulates some relevant thoughts: [A mid-timer's thoughts on publishing academic papers](#)

OK just kidding, here's some high-level paper-writing advice:

- First and foremost, have open conversations with your advisor about what their expectations are in terms of paper-writing. Some advisors prefer to have their students (even junior ones like yourself) write most of the paper, while others do most of it themselves. If you want to optimize for getting your papers published, it's in your interest to have your advisor and senior labmates (e.g., senior grad students, postdocs, etc.) do more of the writing. But if you want to optimize for

learning how to write papers better (even at the expense of getting more rejections), then it's in your interest to do more of the writing yourself.

- Next, whatever writing you need to do on your papers, know that it will take a **surprisingly long time**, much longer than you might first expect. When you start typing out words, it will seem like you're swimming in molasses. This is a normal feeling! Research papers are much, much, much harder to write than whatever casual writing you've done in the past.
- My only advice for paper-writing is to GO FOR VOLUME OF WORDS first and foremost. Papers are surprisingly long and dense in terms of sheer number of words that need to be written. Just getting enough words out on the page is challenging enough, so don't worry about quality when you write. If your particular section needs to be around, say, 3 pages of content, then just do whatever you can to get to 3 full pages. Even if it's 3 pages of junk, get to 3 pages! If you're too concerned with how 'good' your writing is at first, you will likely fail because you'll never write enough of the paper to even make a submission.

Relevant excerpt from [A mid-timer's thoughts on publishing academic papers](#)

You need to keep re-writing [the introduction section] until you **find the soul of your paper**. What the?!? Here's one of my favorite quotes about paper-writing, from [a long-time academic journal editor](#):

Most papers simply lacked a soul – a compelling and well-articulated reason to exist. The world [...] faces an extraordinary number of problems, challenges, dilemmas, and even mysteries. Yet most papers failed to make a good case for why they were necessary. Many analyses were not well motivated or informed by existing theory, evidence, or debates. Many authors took for granted that readers would see the importance of their chosen topic, and failed to connect their work to related issues, ideas, or discussions. Over and over again, I kept asking myself (and reviewers also often asked): So what?

I won't stop refining an introduction section until I feel like I've found the soul of my paper ... and this usually happens right before the submission deadline since I'm fully 'in the zone' and immersed in the paper's details by then! If you haven't found the soul of your paper yet, it's downright rude to submit it ... please don't waste reviewers' time with yet another soulless paper. We've all read and rejected so many.

P.S. If you're wondering why so many papers lack a soul, the quote continues ...

I gradually came to understand that (1) many authors just hadn't yet fully thought through the "so what?" questions and (2) many authors were submitting papers long before they had fully worked through crucial issues related to research design, quality of evidence, and coherence of argument. They didn't do a great job of motivating their questions because they weren't yet fully sure how their work fit in the larger scheme of things. They hadn't thought through the "so what?" of their findings because they hadn't had time to fully make sense of them. They made assumptions or mistakes in their research design and analyses – just like *everyone* does in the early iterations of a project and paper – but they submitted their papers anyway.

Lastly, Jack Conte's talk [Adjust Your Packaging](#) can also be relevant to writing research papers. Watch it and reflect on it yourself (since I don't have time right now to summarize it!)

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**DON'T WORRY ABOUT BIG-TALKERS**

Even though in academia we spend 95% of our time heads-down working alone and silently, the other 5% of the time is spent in social interactions such as weekly lab/group meetings, department seminars, school events, and professional conferences. As a Ph.D. student, you'll observe (by definition!) two kinds of fellow students in these social settings:

- a few who are BIG TALKERS – you know who I'm talkin' about, like they seem to be super eloquent in talking about their work, pontificating about the philosophy of the field more broadly, and schmoozing it up with influential senior people.
- everybody else who, like yourself, is probably pretty low-key and silent when around senior colleagues

Don't worry about the big-talkers. You do your thing, and they do theirs. I could reassure you that big-talkers are just trying to compensate for a lack of substantive work, but that's not always true; some big-talkers *can* back it up with good work, while others can't. My point is that it shouldn't matter to you either way. Don't automatically assume that the big-talkers are somehow “doing better” than you by some unknown metric. After all, social interactions are only 5% of grad school; but it's tempting to feel self-conscious about them since they're the most *visible* parts. You don't see what everyone else is doing the other 95% of the time.

At the junior level in any field, what's far more important is what you do during the 95% of actual work time, not the 5% of social time. You can be as silent as a potato at all professional events, but if you do great work then everyone will still think highly of you. Yes, it's true that as you move up the ranks in the future, the 5% of social time interactions become more important, and you too will have to learn to be a big(ger) talker. But trying to emulate big-talkers too early on is not a good use of your time. Focus on excelling in your 95%-time day after day, month after month, year after year. Eventually you'll find yourself naturally engaging with influential senior people once you've built up a foundation of great work; then younger students will start thinking that *you're* one of the big-talkers :)

## DON'T COMPARE YOURSELF TO OTHER STUDENTS

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*[somewhat related to the above point about big-talkers]*

Even if your advisor tries to be fair, they won't treat every one of their students identically. Different students at different stages of their careers need differing kinds of advisor attention. Moreover, everyone's personality is different and meshes differently with their advisor's, so the ways they interact will differ widely.

Don't directly compare yourself to other students, especially in what kinds of interactions they have with their advisors. You often don't know the full context and details of what your fellow grad students need at any given time.

More broadly, students in your cohort will publish papers at different times and at different rates, and that's OK! This isn't a race; you're not in direct competition with your peers. So celebrate each other's victories! Be happy for them!

And some students will be highly-visible big-talkers who seem to have it all figured out. Again, don't compare yourself to big-talkers ... don't worry about them at all.

Finally, don't compare yourself to your peers at other universities either. There will always be highly-visible outliers who seem to publish a gazillion papers or win a gazillion awards. Don't sweat it. You do your thing, and they'll do theirs. The research pie is big enough for all of us to have a delicious slice :)

## SOCIAL MEDIA AND ONLINE PRESENCE

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*[written in Feb 2021, about a year after I deleted all my social media and most of my online writings/videos/etc., so I'm clearly a bit biased!]*

I've gotten a lot of benefits from being Very Online earlier in my career, but I've also experienced the downsides too. So here is my biased take on what I think new Ph.D. students should do in terms of social media and online presence.

First off, if you don't have a personal website yet, make one ASAP! You can host it for free on your university's servers or [on GitHub](#). It doesn't need to be fancy at all: just create a *single page* and put your basic academic info on there. At minimum, put your name, brief bio, CV, and PDFs of your published papers. It's much much easier for your advisor to refer you to professional opportunities or for potential employers to forward your information along to colleagues when they can simply send a URL. In contrast, LinkedIn or other sites can be a pain since viewers might need to log in to see all your info. Thus, if someone searches for your name, your personal website should come up first, not LinkedIn.

Next, I recommend using social media *carefully* ... I'm not saying you shouldn't use it, because there are certainly benefits, but I think you should be thoughtful about how you use it. Here's some food for thought:

- At the time of writing (early 2021), Twitter is the main site where academics hang out, at least in my field. (When relevant, substitute 'Twitter' for whatever social media site people in your field use.)
- Positive: If you follow a few dozen people in your field on Twitter, you can get a great sense of the latest professional news in your field, such as the latest research papers, debates, and talk videos that are coming out. This can be very powerful for staying 'in the loop' on where your field is headed, which can help your own research. In particular, the **links to projects, papers, talk videos, and blog posts that people post** are the most useful part of your social media feed.
- Another positive: Social media can also be where you find a community of like-minded peers to get social and emotional support throughout your Ph.D. This can be especially valuable for members of underrepresented groups who may have a harder time finding such support in-person.
  - When possible, I highly encourage you to find well-moderated, high-trust, [semi-private groups](#) online if possible. Those environments are safer and hopefully have less harassment/trolling/abuse than public social media.
- Yet another positive: When used properly, social media can help you form valuable professional connections and lower the barriers for you to reach out to more senior members of your academic field. This can potentially open up future collaboration and job opportunities.
- Now for the downsides ... social media is notoriously noisy; even highly-regarded professionals in your field who post intellectually-interesting academic updates are, well, just regular people! They will also be posting about the latest petty gossip, amplifying the news-related outrage of the day, arguing with others in snarky ways, etc. It's up to you to filter out that noise in whatever way you can.
- It's widely-known that social media amplifies FOMO and a sense of *peer comparisons* since you always see the highlight reels and accomplishments of everyone you follow. So when you check your feed it may seem like every single week *somebody* is publishing a new paper or winning a new fellowship or getting a new award or getting their research covered by the press or starting a prestigious internship or landing a coveted faculty or industry job or getting a huge promotion at work or launching their own company or whatever. This can be hugely distracting and demoralizing if you let it get to you.
- Social media amplifies unproductive gossip and time-wasting 'meta' discussions that people engage in when they're procrastinating. It's a lot easier to complain, vent, and speculate online than to make slow, steady, hard-fought progress on research day-to-day. Even if you're only reading and not posting, this exposure

alone can drag down your mood and make you overly cynical. If your information diet is filled with junk food, then your brain will turn into a garbage heap.

- This often occurs on discussion forums and in social media group posts.
- I know that some of these discussions can provide emotional support and solidarity, which is positive! But there's a very fine line between emotional support and the unhealthy complaining, pile-ons, and vicious cycles of cynicism that drag everybody in your group down, [crabs-in-a-bucket style](#).
- [Context collapse](#) is a huge problem on social media, especially for academics. That's because you can follow people who are well-known senior members of your field and see them interact with people from all career stages. While in theory this ought to be positive (a first-year Ph.D. student can be interacting with senior faculty!), in practice this can lead to problems. Without the social norms of how people interact in-person, social media exchanges can get awkward. For example, if two senior researchers are gossiping amongst themselves, even on a public platform like Twitter, they don't expect someone outside their social circle to chime in; it would be like if you walked up to those two people at a conference when they're deep into a one-on-one conversation and just started talking.
- Related to the above point, even if you're passively reading your social media feeds and *not* actively participating, just the fact that you're reading Twitter conversations between senior members of your community could have detrimental effects on you (even if they don't have any ill intent! they're just talking shop with their friends). This is because you probably lack the context of their conversations, so it may give you the wrong idea about how things work in your academic field. In real life, you're not meant to eavesdrop on so many senior colleagues' private conversations with each other, but this happens all the time on Twitter because people talk very candidly to one another in full public view.
- If you mimic what your academic role models (e.g., senior colleagues) do on social media without context, that can also be bad. For instance, let's say a well-respected senior professor posts: "*Screw these idiot reviewers in X sub-field that just rejected my paper! They don't appreciate my work at all. Our approach is twice as good as what people in X have been doing for years!*" While that may sound harsh, a tenured professor's career is unlikely to be harmed by that outburst. However, if you then go and imitate this rhetoric as a grad student the next time your paper gets rejected (because you've seen your role models do so online!), then people are going to definitely hold it against you. Most examples aren't that blatant, of course, but in general grad students trying to 'talk the talk' that they see senior colleagues doing online risk making a bad impression.
- Finally, what people post on social media may give you a warped sense of the true career incentives in your field. As one example, if you follow certain types of super-vocal academics on social media, then you may be led to believe that what really 'matters' for career advancement in academia is being Very Active Online (e.g., tweeting, blogging, giving public talks, doing thought leadership, etc.). The reality is that academia is still very old-fashioned: what really matters for career advancement, especially early-on in your career as a Ph.D. student, is *publishing well-regarded academic papers in your field*. Everything else is secondary.

Bottom line: use social media if you want, but you definitely don't *need* it to be a successful Ph.D. student. Do create a simple personal website, though. Then focus as much as you can on doing work that leads to publishing well-regarded papers in your field. The best online presence in the world won't help your career if you don't have a strong publication record. And that's the bottom line, cuz [Stone Cold said so](#).

#### COMMONLY OBSERVED STRUGGLES

*[Written in June 2020 after finishing my sixth year as an assistant professor. By this point I've participated in six end-of-year meetings where faculty collectively*

*discuss the progress of all Ph.D. students in our department. Here are some of the most common struggles we've seen.]*

- **Lack of focus:** Jumping between projects too frequently, quitting a path too early and switching to whatever else looks new and exciting, juggling multiple unrelated projects, trying to emulate what they see some faculty doing by collaborating as a co-author on a bunch of unrelated papers rather than working toward one's own first-author papers.
- **Not telling advisor that they're stuck:** Some students are stuck for long periods of time without telling their advisor, perhaps due to fear or shame. The more time that passes, the harder it is to talk to their advisor about this, and the more they resort to procrastination (see next point), which further stalls their progress. [Also see the prior section on *Avoid the dreaded loop of despair*]
- **Using other activities as procrastination:** Research is inherently hard, so it's all too easy to procrastinate on it by spending a ton of time on other activities that have shorter-term and more tangible rewards. Of course, it's *great* to have extracurricular activities; that's what makes life worth living! Believe me, I'm *not* trying to discourage that at all. But if you find yourself spending too much energy on those and not enough on research, then that could be a sign that your research progress has stalled.
- **Not having a single lead advisor:** Especially for students working on interdisciplinary projects or co-advised by several faculty (maybe across multiple departments), it's easy to fall through the cracks since no single person takes the lead advisor role. If no faculty can clearly summarize what you're currently working on, then that's a bad sign. Ideally you would be on one single advisor's critical path so that they're highly motivated to track your research progress. (By *critical path* I mean the path of work that is critical for their career advancement or fulfillment at the given moment in time.)

Relevant videos that reinforce the above points:

- [Advice for first-year Ph.D. students](#) (2015)
- [What I Tell New Ph.D. Students at Orientation](#) (2017)

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#### MISC. RESOURCES I DON'T HAVE TIME TO DESCRIBE RIGHT NOW ...

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- [Notes on creative context](#) by Michael Nielsen
  - one role of research advisor: [mentoring creativity](#) -- 3-minute video by me
  - another role of research advisor: [the immediate next step](#) -- 3-minute video by me
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