

The life of the PhD student is fraught with peril.  
Enemies swarm from every angle.  
Some attack from without: low stipends, irrelevant courses, anonymous reviewers.  
But more attack from within: self-doubt, anxiety, insecurity.  
This is where the key battles are waged.

Consider one of the world's most well-known academics: Professor Indiana Jones. The external dangers in the films are many, though always overcome with ingenuity or fisticuffs. The climactic struggles are internal.

The journey of a PhD student is a long one. Early on, the time is spent developing skills. Mathematical maturity. Implementation ability. Experiment management. A broad perspective. Later, the time is spent contributing to the repository of knowledge in the community. Others have already written about these better than I ever could [desJardin, Dredze and Wallach, Guo, Stearns, *inter alia*].

Less discussed is managing the rich interior life of the person. Below are suggestions on how to be a happier PhD student, ordered from concrete to abstract. A happier student does better work. But more importantly, a happier student is a happier student.

## 1 Commit to a sustainable work schedule.

PhD students agonize over how to spend their time. My suggestion is to find a sustainable working schedule that works for you, then commit to it.

For me, this meant 8 hours a day, 5 days a week. Not 5 hours one day and 11 the next. Not 7 hours 6 days a week. Not being in the office 9 hours but spending 2 of those hours on non-work. Not working whenever I feel like it coupled with a weekly all-nighter to catch up. I've tried it all.

Committing to a schedule guards against working too little *and* too much. Both are hazardous to happiness.

**Don't work too much.** Find a life outside of work. Invest in friendships with labmates (so you can talk about work with friends) and non-labmates (so that you have friends with whom you *can't* talk about work!). If work is all you do, its importance will dominate your existence, and the inevitable setbacks will feel overwhelming.

**Don't work too little.** Research is risky and open-ended. High-risk ideas are pursued half-heartedly or not at all. Since the idea might not pan out, the student delays starting on it. This leads to stress, which wastes more time and often leads to tension with one's advisor. Because the student fears he might waste time, he wastes time by not doing anything!

When you are working to fulfill your daily hourly commitment, you will begin to do those things you don't want to do. You can easily spend an hour on that risky project, because

that's a tangible contribution toward your (very) short-term goal of working  $n$  hours that day. If you have to spend that hour working rather than, say, making excuses for not working or agonizing over what to do next, you will Just Try Something. Who knows? It might lead to something interesting. Which brings us to our next point.

## 2 Just Try Something.

Research is the search for reality. Reality perpetually eludes our grasp. Things never turn out quite how we envision them. So sometimes you have to stop theorizing and Just Try Something.

A well-performed experiment produces an experimental result. This result is always, in some sense, a discovery. You have either obtained an experimental result that no one else has ever obtained, or you have successfully replicated someone else's result. Either way, it is cause for pause. What does this result mean? How does it change our conception of things? How should it cause us to update our worldviews?

One muddling point is that your result may not actually be informative. Much of the time, the PhD student is trying to show that her Bright Shiny New Idea is better than Some Standard Baseline. While in this mode, it is common to let some of the implementational or experimental methodology slip. This brings us to our next point.

## 3 You probably have a bug.

Whether things are going well or poorly, whether it seems too fast or too slow, whether it works better or worse than you expected, you probably have a bug. Tons of papers have been published with bugs, often found much later. Sometimes it doesn't affect the results much. Sometimes it does. The human researcher is nimble and creative, but also liable to make tiny errors constantly.<sup>1</sup>

When a student obtains that first result with his Bright Shiny New Idea, it typically sends him to either exhilaration or depression. Awaiting and absorbing these initial results is emotionally exhausting. To make things worse, the initial results often don't even reveal that much information.

My advice is to plan a contingency for either outcome. Check for bugs in case of failure or success. Try variations on your ideas that require you to go back through your experimental procedure many times, which will increase your chances of finding errors. Add more assertions and comments than actual lines of code. Each result can be a legitimate discovery, but only if there are no bugs.

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<sup>1</sup>These could be errors in any sort of research cycle, not just bugs in code for experimental computer scientists. If you're proving theorems, your bug might be a flawed assumption or a mistake in a step. If you're doing biology, your bug might be contamination from any number of sources.

Whether things are going amazingly, or going terribly, or just going OK: You probably have a bug. After you find and fix ten bugs, you probably have another bug. After you've published ten amazing papers with the same codebase, you probably still have a bug.

## 4 Forget yourself. Focus on the phenomena.

Imagine a defensive, insecure, competitive meteorologist. Agonizing over the accuracy of his forecasts. Downplaying inaccurate predictions while emphasizing successful ones. Constantly comparing his predictive performance to those of his competitors.

Now imagine a meteorologist who is honest and humble, pointing out both when he was right and wrong, and explaining why it happened. He forgets himself and focuses on the beauty and complexity and importance of the phenomena. This is a weather report you would like to watch.

PhD students (and people in general) are tempted to be like the insecure meteorologist. Wrong just as often as everyone else, but always seeking to hold themselves up as examples of brilliance. No one really cares how brilliant you are.<sup>2</sup> They are watching the weather report because they care about the weather, not because they care about you.

As long as you dwell inordinately on your brilliance and reputation, you will never be happy. Self-focus brings stress and kills the ability to enjoy the beauty of the discoveries you are making. Humility produces a receptivity to the wonder and richness of reality. As Chesterton wrote:

The phrase would probably be misunderstood; but I should begin my sermon by telling people not to enjoy themselves. I should tell them to enjoy dances and theatres and joy-rides and champagne and oysters; to enjoy jazz and cocktails and night-clubs if they can enjoy nothing better; to enjoy bigamy and burglary and any crime in the calendar, in preference to this other alternative; but never to learn to enjoy themselves. Human beings are happy so long as they retain the receptive power and the power of reaction in surprise and gratitude to something outside....

The moment the self within is consciously felt as something superior to any of the gifts that can be brought to it, or any of the adventures that it may enjoy, there has appeared a sort of self-devouring fastidiousness and a disenchantment in advance, which fulfils all the Tartarean emblems of thirst and of despair....

—G.K. Chesterton, *The Common Man*

Seek to promote good work. If it happens to be your own, fine. But work is not good *because* it's your own. Chesterton later writes: "Pride consists in a man making his personality the only test, instead of making the truth the test. It is not pride to wish to do well, or even to look well, according to a real test. It is pride to think that a thing looks ill, because it does not look like something characteristic of oneself."

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<sup>2</sup>The only people who care about your brilliance are those who are considering hiring you. But there too, hiring committees prefer someone who immerses herself in the richness of her research area.

Research is done within a community. Inordinate self-promotion is alienating and harmful, and is antithetical to the healthy functioning of the community. Do you think Indiana Jones cared about self-promotion? He was too busy saving the world! If you can routinely save the world, you don't need to self-promote. They'll make movies about you.

## **5 Don't pick a side (including your own!)**

Some contentious issues will arise in your field. What sort of issues? Determining who should get (the most) credit for a particular invention or result, determining whether or not a published result is valid, deciding whether a particular dataset or problem is worth keeping or should be discarded, and embracing or criticizing a new result, evaluation, or research methodology.

It is sometimes necessary to take a firm stance on an issue. When it is, pick a side.

But most issues are just not worth it, because there's usually a fair amount of evidence for each side. Due to our irrational tendency to commit to a belief before all the evidence is in, most researchers will choose a side. Consciously or unconsciously, they tend to use subjective criteria when doing so, such as personality, brilliance, style, or academic lineage. Sometimes these criteria are weighed more than any objective ones.

The scientist should be able to step back and take a broader perspective. The easiest way to do this is to refuse to take a side. You will be happier this way, because you won't feel the psychological pressure to confirm your bias when reviewing new evidence on the issue. People will notice and will respect you for seeking the truth even though it may be uncomfortable (and lonely) in the middle.

When taxpayer-supported agencies give us money, it is to support objective scientists working together in a community to add to the repository of knowledge in the world. It is not given to fuel pettiness. Or to add arms in the fight of one warring clan against another. Or to convince people that you contributed more than someone else. This is all abuse of public funds. And it will not make you happier.

## **6 Don't compare yourself to others.**

Most of the stress experienced by the PhD student comes from comparing oneself to others. The student seeks to emulate an ideal that she observes, failing to discern whether that ideal is desirable for her or even desirable in general.

Working hours are one of the most concrete ways to compare yourself to other students. Some students brag about working many hours, some brag about working very few, and sometimes the same people brag about both!

Refuse to play this game. None of it is helpful. Such concerns turn one inward, as the student focuses more on how he compares to others than on the quality of his work, the

depth of his understanding, or the breadth of his perspective.

You are different from others, so it is completely inappropriate to compare yourself to them as if you are all the same. A comparison is only apt when you have controlled for all variables. But two people cannot be compared because there are millions of differing variables. So any comparison would reflect more about those other variables than about anything of substance. If someone writes more papers than you, that should not send into torrents of despair. If they write fewer papers than you, that should not send you to the heights of ecstasy.

Let me clear something up right now: You're not the best. That's ok. You can't do everything, and you won't make the greatest discovery ever made. But you can do *something*. You have an opportunity to make a real, lasting contribution to science. A contribution that no one else has ever made, or even would have ever made.

## 7 Concluding Remarks

Reality is strange. All the worlds we construct are comparatively simple. But some aspect of reality always eludes our grasp. We will never completely circumscribe it. Research is the search for reality. It is a wonderful search. It keeps us humble. Authentic humility is striving to see things how they are, rather than how we want them to be.

You will be happier once you shed the parasites of pride and self-absorption and enter into authentic freedom through a life grounded in reality.

I'll close with two quotations that describe this better than I can:

In the day-to-day trenches of adult life, there is actually no such thing as atheism. There is no such thing as not worshipping. Everybody worships. The only choice we get is what to worship. And an outstanding reason for choosing some sort of God or spiritual-type thing to worship—be it J.C. or Allah, be it Yahweh or the Wiccan mother-goddess or the Four Noble Truths or some infrangible set of ethical principles—is that pretty much anything else you worship will eat you alive. If you worship money and things—if they are where you tap real meaning in life—then you will never have enough. Never feel you have enough. It's the truth. Worship your own body and beauty and sexual allure and you will always feel ugly, and when time and age start showing, you will die a million deaths before they finally plant you. On one level, we all know this stuff already—it's been codified as myths, proverbs, clichés, bromides, epigrams, parables: the skeleton of every great story. The trick is keeping the truth up-front in daily consciousness. Worship power—you will feel weak and afraid, and you will need ever more power over others to keep the fear at bay. Worship your intellect, being seen as smart—you will end up feeling stupid, a fraud, always on the verge of being found out. And so on.

Look, the insidious thing about these forms of worship is not that they're evil or sinful; it is that they are unconscious. They are default-settings. They're the kind

of worship you just gradually slip into, day after day, getting more and more selective about what you see and how you measure value without ever being fully aware that that's what you're doing. And the world will not discourage you from operating on your default-settings, because the world of men and money and power hums along quite nicely on the fuel of fear and contempt and frustration and craving and the worship of self. Our own present culture has harnessed these forces in ways that have yielded extraordinary wealth and comfort and personal freedom. The freedom to be lords of our own tiny skull-sized kingdoms, alone at the center of all creation. This kind of freedom has much to recommend it. But of course there are all different kinds of freedom, and the kind that is most precious you will not hear much talked about in the great outside world of winning and achieving and displaying. The really important kind of freedom involves attention, and awareness, and discipline, and effort, and being able truly to care about other people and to sacrifice for them, over and over, in myriad petty little unsexy ways, every day. That is real freedom. The alternative is unconsciousness, the default-setting, the 'rat race'—the constant gnawing sense of having had and lost some infinite thing.

—David Foster Wallace

And from a Christian perspective:

We must not think Pride is something God forbids because He is offended at it, or that Humility is something He demands as due to His own dignity—as if God Himself was proud....He wants you to know Him: wants to give you Himself. And He and you are two things of such a kind that if you really get into any kind of touch with Him you will, in fact, be humble—delightedly humble, feeling the infinite relief of having for once got rid of all the silly nonsense about your own dignity which has made you restless and unhappy all your life. He is trying to make you humble in order to make this moment possible: trying to take off a lot of silly, ugly, fancy-dress in which we have all got ourselves up and are strutting about like the little idiots we are. I wish I had got a bit further with humility myself: if I had, I could probably tell you more about the relief, the comfort, of taking the fancy-dress off—getting rid of the false self, with all its 'Look at me' and 'Aren't I a good boy?' and all its posing and posturing. To get even near it, even for a moment, is like a drink of cold water to a man in a desert.

—C. S. Lewis, *Mere Christianity*

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