Overcoming the second year slump.

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Bath PG Away Day

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I am not a PhD-self-help guru

The advice I’m going to give is based on my own experiences

You’ve probably heard much of it before (hopefully because it’s true/useful!)
Life as a PhD student....

(legal bit) "Piled Higher and Deeper" by Jorge Cham www.phdcomics.com
The fatal attractor of a PhD...
The fatal attractor of a PhD...

- Loss of motivation
- Money runs out!
- Lack of progress

- Ideally, you don’t want to wait until the money runs out
Why is doing a PhD hard?

\[ \text{PhD} = \text{do research} + \text{explain it} \]

- Research is difficult:
  - unpredictable
  - inherent risk of failure

- Explaining research is difficult:
  - need to distinguish between the “forest” and “the trees”
  - (inherent in explaining is understanding)

- Environment is challenging
The PhD environment

- (the price one pays for being on the frontier of knowledge)

- I claim that the most common limiting factor in doing a PhD is coping mentally with this environment
Thoughts that drag you into the fatal attractor:

- Think what you’re doing/have done is rubbish
- Think no-one is interested in your research
- Fed up with the topic
- Frustrated - things always take longer to do than expected
- Overwhelmed – too many things to do
- ...and everyone else seems to be coping fine!
Another take on it...

So imagine that you have written a paper that you think is good. How do you know it is good? Being a mathematician is a bit like being a manic depressive: you spend your life alternating between giddy elation and black despair. You will have difficulty being objective about your own work: before a problem is solved, it seems to be mightily important; after it is solved, the whole matter seems trivial and you wonder how you could have spent so much time on it. How do you cut through this imbroglio?

(From “A primer of mathematical writing” by Steven G. Krantz)
If doing a PhD were a film...

...it would be a psychological thriller:

*Characters are no longer reliant on physical strength to overcome their brutish enemies (which is often the case in typical action-thrillers), but rather are reliant on their mental resources, whether it be by battling wits with a formidable opponent or by battling for equilibrium in the character’s own mind.*

(Wikipedia)
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(Wikipedia)
Top Level Sport

- 10% physical
- 90% mental

(ish?)
Top Level Maths

- 10% mental - maths
- 90% mental - “psychological strength”
What is the goal?

- Get out of fatal attractor and get a PhD
- i.e.
  - do the right research...
  - ...working productively...
  - ...and being (relatively) stress free

But how to do it?
Rest of the talk:

6 pieces of advice

- range from actions to mindset
- all consequences of understanding the environment
Maintain a good relationship with your supervisor

(legal bit) "Piled Higher and Deeper" by Jorge Cham www.phdcomics.com
Maintain a good relationship with your supervisor

- Supervisor is interested in what you’re doing!
- Supervisor has more experience in research that you have
- During most PhDs the plan changes, need to be flexible
Talk to people

You are now doing the toughest thing you will ever have done in your life. It is essential that you talk to people—all the time. In this way you can orient yourself, keep to your course, be sure you are doing the right thing, and have a constant reality check.

(From “A Mathematician’s Survival Guide” by Steven G. Krantz.)
Talk to people

- Other students

- Other mathematicians (e.g. give talks, go to conferences)

- Non-mathematicians
Write things...

- up – maths

- down – plans, ideas, goals, thoughts, fears, obstacles, achievements...

Writing forces you to organise your thoughts
“Aim: to fly high, but keep the spirit level”

(from John Toland)

- Be realistic about the potential impact of your research, but optimistic that you can achieve this.

- It’s fairly easy to be critical of even the best maths out there.

- Doing research and being a pessimist is not fun!
Don’t try to work all the time!

(legal bit) "Piled Higher and Deeper" by Jorge Cham www.phdcomics.com
Don’t try to work all the time!

- You are not your PhD
- Do other things
- Littlewood
- Try to keep a sense of perspective
“Know thyself”

▶ Try and understand your mental processes
  ▶ What are you afraid of?
  ▶ What are you doing to distract yourself from doing the important stuff?

▶ “Get yourself out of the way”
Some resources

Time management:
- Tim Ferriss: book (“4 Hour Work Week”) and blog
- Randy Pausch time management lecture (YouTube)
- Leo Babauta: “Focus” ebook (free!)

Psychology:
- Robert Wiseman, “59 Seconds” – easily digestible and scientifically tested “self-help” advice on e.g. motivation
- PhD comics

Maths specific:
- Steven G. Krantz, “A Mathematician’s Survival Guide: Graduate School and Early Career Development”
- (These slides will be on my webpage)
Summary:

- Most important factor in getting PhD is psychological strength.

- Easy to get sucked into the “fatal attractor” of loss of motivation $\iff$ lack of progress.

- To combat:
  1. Maintain a good relationship with your supervisor
  2. Talk to people
  3. Write things up and down
  4. “Aim: to fly high, but keep the spirit level”
  5. Don’t try to work all the time
  6. “Know thyself”