DON'T PANIC

The Grad Student's Guide to Surviving your PhD
Don’t Panic
—or—
how to survive your PhD

Jilles Vreeken
Disclaimer

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2) Any advice you’ll get is useless.

Don’t ask survivors for advice.
"Russian roulette is a great way to make money!"
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3) This is not a scientific presentation.
I used to think correlation implied causation.

Then I took a statistics class. Now I don't.

Sounds like the class helped. Well, maybe.
Disclaimer

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2) Any advice you’ll get is useless.
3) This is not a scientific presentation.
4) I stand on the shoulders of giants.

and many, many others
Let’s start with the **best** advice you’ll ever get...
I’m not afraid.
Yes...
you will be.
You will be.
Time of Disillusionment

I have some **bad** news for you

Doing a PhD will help you find out
- there are people who are better than you
- you are not good at everything
- being good at courses is not enough
- doing what you are told may not be enough

And, most prominently: **life is unfair**
- people less smart or hard-working will be luckier, get better results
- people who have done worse work will end up with better jobs
First things first

Why do a PhD?
It's gonna make me rich!
Its gonna make me rich!

NO.
Salary by Degree

Years of Experience

<1 1-4 5-9 10-19 20+

Yearly Salary in EUR

BA/BSc PhD

payscale.com/research/DE/
Salary by Degree

Years of after BA/Bsc

<1 1-4 5-9 10-19 20-29 30+

Yearly Salary in EUR

BA/BSc

PhD

payscale.com/research/DE/
Variation in Salary

Years of experience explains 28% of the variation in salaries. Knowing whether you are a manager or have a PhD add another 4 percentage points.
Variation in Salary

Years of experience explains 28% of
5 extra years of experience
worth more than a PhD!

PhD add another 4 percentage points.

measuringusability.com/usability-phd.php
Some degree-less people

- $72bn
- $10bn
- $28bn
- $27bn
Some degree-less people

Skill sets and interpersonal skills vs. academic qualifications.
First things first, again

Why do a PhD?
Because my PhD is gonna change the world!

I’m going to change the world and this is my plan...
Because my PhD is gonna change the world!

NO.
Because my PhD is going to change the world!

Big Problems are **Big** because they are **Hard**

**NO.**
Because my PhD is gonna change the world!

Big Breakthroughs are *rare*, very *rare*. Once-a-career rare, *if* you’re lucky.

**NO.**
Because my PhD is gonna change the world!

If you want to change the world, become a politician.

NO.
DON'T PANIC
If you’re here for the right reasons...

Doing a PhD can be awesome

But, what is the right reason?
If you’re here for the right reasons...

The One and Only Right Reason to pursue a PhD:

you are **fascinated** by a topic, you **want** to know all there is, and **need to discover** even more.
You’ll have to like both the big results and the little ones.
What’s Great about Working in Science

Freedom!
- set your own agenda, schedule, ...

You get to travel regularly
- to Beijing, to Paris, to Barcelona, to Dallas, how cool ...

What dress code?
- I’ve seen keynote speakers in pyjamas

Invisible band uniting all geeks
- helpful, enjoy learning, similar language

Surrounded by people who never grew up
- smart kids who love to play
What’s Great about Working in Science

How grad school is just like kindergarten

All day napping is acceptable

There is constant adult supervision

You get cookies for lunch

Most common activity: cutting and pasting

There are no grades (you just have to play well with others)

Crying for your mommy is normal

WWW.PHDCOMICS.COM
What’s Great about Working in Science

Working in science is amazing ... ... if you appreciate its benefits.
Perspective

Industry, according to academia
Perspective

Academia, according to industry

researchinprogress.tumblr.com
Perspective

Industry, according to academia
Perspective

There’s stress everywhere. Just different kinds.

Industry, according to academia
What is a PhD?
What is a PhD? science?
What is a PhD? science?

‘knowledge or a system of knowledge covering general truths or the operation of general laws especially as obtained and tested through scientific method’

(Merriam-Webster)
What is a PhD? *science?*
What is a PhD? *science*?

Because!

Science is about discovering things we didn’t know
What is a PhD? science?

Because!

Science is about discovering new knowledge!
What is a PhD?
What is a PhD?

No, really, what is a PhD?
and keep pushing.
Sometimes...
Sometimes...

WELL CRAP
Sometimes…

You’re stuck.
Sometimes… You’re stuck.

I NEED AN ADULT
Sometimes…

You’re stuck.

Don’t be afraid to ask for help.
...So, Prof. Jones, I'm totally stuck! What should I do?

HMMMM...

Well, you should probably fix it.

That's it? That's your advice?

You should do it soon, too.
You & Your Advisor

Before you begin, let me just say I don't want to hear about any problems or difficulties you've been having.

I don't want to hear any excuses or extenuating circumstances.

The only thing I want to hear is what you're doing about it. What's your plan to resolve the situation?

My plan was to come here and have you tell me what to do. You need a new plan.
We’re explorers
- we may strike gold, or
- find dirt, dirt, and more dirt

We don’t know the way
- we follow intuition, and see where it leads us...
- soon, you’ll know ‘the way’ better than your supervisor

Are you afraid of the Dark?
We're explorers, we may strike gold, or find dirt, dirt, and more dirt. We don't know the way, we follow intuition, and see where it leads us...

soon, you’ll know ‘the way’

better than your supervisor.

Are you afraid of the Dark?

If you’re afraid of the dark research is not for you.

We don’t know the way.
You & Your Advisor

- You are 1 of $N$ students
- Your paper is 1 of $M$ papers
- (S)he reviews $P$ papers a year
- (S)he teaches $Q$ courses a year
- (S)he attends $X$ committee meetings a week
- (S)he travels $Y$ times a year

Do the math!!! (S)he only has

$$\frac{(365 - 14 - 52 \times 2 - 5Y) \times \left(8 - \frac{X}{5}\right) - 4P - 3 \times 16Q}{52 \times N \times M}$$

hours /week for you

$N=5, M=10, P=20, Q=2, X=5, Y=4$

answer = 0.54
You & Your Advisor

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hours /week for you

$N=5$, $M=10$, $P=20$, $Q=2$, $X=5$, $Y=4$

answer = 0.54

Be realistic about your advisor’s time (and hence, choice of advisor)
You & Your Advisor

Keep your advisor up-to-date, but don’t spam
- Be interesting, not pestering

Agree on and check against SMART goals
- Specific, Measurable, Attainable, Realistic, Timely

Try to phrase suggestions, not questions
- “I think we should do X” vs. “Should we do X?”

There are other helpful people, you know?
- officemates, postdocs, fellow students
You & Your Advisor

Keep your advisor up-to-date, but don’t spam

- Be interesting, not pestering

Agree on concrete goals.

- Specific
- Measurable
- Attainable
- Realistic
- Timely

Try to phrase suggestions, not questions

- “I think we should do X” vs. “Should we do X?”

Be proactive.

Learn from fellow students.

There are other helpful people, you know?

- officemates, postdocs, fellow students
EVERYBODY'S PUBLISHING

AND I'M JUST SITTING HERE...
What is a PhD about?

Learning how to do science, such that you become an independent researcher.
What is a PhD about?

Learning how to do science,

such that you become

an independent researcher
What is a PhD about?

Learning how to do science.

Do **not** compare yourself to more senior people.

You are already an independent researcher.
All these papers are so nice...
All these papers are so nice...

and my research is not going anywhere...
All these papers are so nice...

Published papers are smooth representations of long and messy processes

and my research is not going anywhere...
Reaching the Goal
Reaching the Goal

The objective schema can lead to frustration when the project goes off track.

A

B
Reaching the Goal

<table>
<thead>
<tr>
<th>The objective schema can lead to frustration when the project goes off track</th>
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</tr>
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<tbody>
<tr>
<td><img src="weizmann.ac.il/mcb/UriAlon/nurturing/HowToChooseGoodProblem.pdf" alt="Diagram" /></td>
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## Reaching the Goal

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A - Goal

B - Project

C - Support and new directions
A good **problem** is often worth more than a good **solution**!
Time to learn

As a grad student you have to learn a lot

- new students often think they know everything.
Time to learn

Penguins are black and white. Some old TV shows are black and white. Therefore, some penguins are old TV shows.

Logic: another thing that penguins aren’t very good at.
Time to learn

As a grad student you have to learn a *lot*

- new students often think they know everything.
- no bachelor student can immediately make a contribution
Time to learn
Time to learn

As a grad student you have to learn a lot

- new students often think they know everything.
- no bachelor student can immediately make a contribution

However, you’re being paid to learn

Find out what you need to know.
As a grad student you have to learn a lot. New students often think they know everything. However, you're being paid to learn. Find out what you need to know. Learn what it is. Read about it. Take classes. Practice.

Diagram:

- Your Comfort Zone
- Where the magic happens
Time to learn

As a grad student you have to learn a lot
- new students often think they know everything.
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Find out what you need to know.
Learn what it is. Read about it. Take classes. Practice.
Time to learn

As a grad student you have to learn a lot
- new students often think they know everything
- no bachelor student can immediately make a contribution

You’re being paid to learn
How cool is that?

Find out what you need to know.
Learn what it is. Read about it. Take classes. Practice.
Science means a *lot* of writing

A paper is a story, not a shopping list
- there needs to be a plot

Any draft can be shortened without loss
- don’t believe information theoretic lower bounds

Get help with concise but complete writing
- don’t forget reproducibility

Don’t have sentences being written in passive voice
- they will not be easily read

Hard to improve without detailed feedback
Scientific Writing – in English

Even if sentences being written in passive voice,
- they will not be easily read

Hard to improve without detailed feedback
Scientific Writing – in English

For every word ask: is it necessary?
Train your language and writing skillz

Don’t have sentences being written in passive voice:
  - they will not be easily read

Hard to improve without detailed feedback
So you finished your masterpiece, submit it, wait...

- and then the reviews come in
So you finished your masterpiece, submit it, wait...
- and then the reviews come in

Reject
Notification
What is a PhD about?
Learning how to do science, such that you become an independent researcher.
Reject

So you finished your masterpiece, submit it, wait...
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Happens to the best

Getting something published can be hard
- 10 to 20% acceptance rate means
- 80 to 90% of the papers get rejected
Reject
Reject
Reject

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Happens to the best

Getting something published can be hard
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Lots and lots and lots and lots of noise in the review process
- take reviews seriously, re-evaluate, improve your paper, resubmit
Reject

So you finished your masterpiece, submit it, wait...

- and then the reviews come in.

Getting scared?

- 10 to 20% acceptance rate
- 80 to 90% rejection rate

Lots and lots and lots and lots of noise in the review process

- take reviews seriously, re-evaluate, improve your paper, resubmit
So you finished your masterpiece, submit it, wait...

- and then the reviews come in

Can take time to get published. Use reviews to improve your paper, don’t overfit.

- 10 to 20% acceptance rate means
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Lots and lots and lots and lots of noise in the review process
- take reviews seriously, re-evaluate, improve your paper, resubmit
How to work

Everybody works differently

- find out what works for you
I’M NOT A MORNING PERSON
How to work

Everybody works differently
- find out what works for you

It’s **not** about how many hours — *stupid* !!1!!!one!
- say no to peer pressure

Create a stimulating environment
- optimize your workplace
geek productivity at work

- how non-geeks think it works
- how it actually works

- sampling points likely to used by non-geeks to get a general picture of how geeks work

along the day:

effect of a 5-min interruption (or a meeting!)

5 min

recovery

copyright (c) 2013 Bruno Oliveira - bit.ly/brunooliveira - share freely
How to work

Everybody works differently

- find out what works for you

It’s not about how many hours — stupid!!1!!!one!eleven

- say no to peer pressure

Create a stimulating environment

- optimize your workplace

Focus

- and procrastinate when you can’t
How to work

Everybody works differently

- find out what works for you

It's not about how many hours — stupid!!

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Create a stimulating environment

- optimize your workplace

Focus

- and procrastinate when you can’t

PhD Goal: figuring out how you get your best ideas
I don't know man..

Sometimes, I don't want to move it move it.
Sometimes, it’s just not happening. No need to keep your chair warm, call it a day – go out, have fun. Who knows, maybe you’ll even get a good idea.
When You’re Feeling Low

It’s not so bad, really
- don’t get yourself down

Acknowledge the good times
- keep a folder with past accomplishments, with e.g., graduation photos, acceptance notifications, awards, conference visits, etc.
When You’re Feeling Low

Everyday mood and emotions after eating a chocolate bar or an apple

Michael Macht *, Dorothee Dettmer
When You’re Feeling Low

Everyday mood and emotions after eating a chocolate bar or an apple

Michael Macht *, Dorothee Dettmer

![Graph showing mood changes over time after eating chocolate, apple, or nothing.]
When You’re Feeling Low

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It's not so bad, really
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When You’re Feeling Low

Who cares about “an apple a day …”, it’s: “a chocolate bar every 30 minutes”!

Who cares about “an apple a day …”, it’s: “a chocolate bar every 30 minutes”!

public.randomnotes.org/richard/PhDtalk.html
Celebrate Your Victories
"REMEMBER, WINNING ISN'T THE ONLY THING. YOU ALSO NEED TO DEVELOP A GREAT VICTORY DANCE."

http://www.cartoonstock.com/directory/v/victory_dance.asp
Celebrate Your Victories

“Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful.”

Albert Schweitzer

Some groups have “publication cakes”
■ Make it chocolate, please!

Acknowledge everyone somehow involved
■ Create a positive group atmosphere
Celebrate Your Victories

“Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful.” —Albert Schweitzer

If you're **happy** and you know it, then you really ought to **show it**!

Some groups have "publication cakes"

- Make it chocolate, please!

Acknowledge everyone somehow involved

- Create a positive group atmosphere
Attending a Conference

. . . (Ping) The captain has turned off the seat belt sign...

So... are you travelling for business or for fun?

Me? Well...

I'm going to a research conference so... it's... uh... sort of... um...

None of the above?

It's not for fun, that's for sure.
Attending a Conference
Attending a Conference

Talk to people at all occasions
- after presentations, in coffee breaks, in rest rooms

Plan which sessions/presentations to attend
- combination of topic and presenter

Make the most out of a poster presentation
- engage people, offer free candy and advertise it
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  - universities and institutes nearby
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- universities and institutes nearby

Be as active as possible. It is boring if you’re not.
Giving a Presentation
What is a PhD about?
Learning how to do science, such that you become an independent researcher.
Surviving on Stage

Just a few things to remember

The medium matters as much as the message
- it is all about confidence

Realise that you are the expert
- attendees want to learn what you discovered

It is not a competition (anymore)
- your paper was accepted, now it is about advertising
The Body shapes the Mind

How you **feel** influences how you **behave**.
The Body shapes the Mind

How you **behave** influences how you **feel**.
The Body shapes the Mind

How you **behave**
influences how you **feel**
influences how you **behave**

The Body shapes the Mind

Only two minutes of power posing reduces stress levels and changes behaviour.

Power Posing

Amy Cuddy (2012) Your Body Language Shapes Who You Are, TEDglobal
Power Posing

Amy Cuddy (2012) Your Body Language Shapes Who You Are, TEDglobal
Power Posing
Giving a Presentation
DEATH BY POWERPOINT
Giving a Presentation

Don’t overestimate your audience
- Go sloooow on technical details – or leave out

Don’t overestimate your time
- 90-100 seconds per normal slide

Who on earth invented overview slides?!?
- Introduction, ... Experiments, ... Conclusions

Clearly emphasize the key points
- Visually and audibly

Think about the take-home message
- say thanks on the last slide, keep the conclusion visible

Get feedback on all aspects and practice
Giving a Presentation

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Who on earth invented overview slides?!?
- Introduction, … Experiments, … Conclusions

Clearly emphasize the key points
- Visually and audibly

Highlight the key points.

Think about the take-home message
- say thanks on the last slide, keep the conclusion visible

Get feedback on all aspects and practice
Survival Checklist

Put yourself in the shoes of your audience
- your advisor, your readers, conference attendees, ...

Get your priorities straight
- define achievable short-term goals and stick to them

Learn when to say no
- don’t get involved in too many things

Be thoughtful about networking opportunities
- personal story

from “A PhD is not Enough!”, Feibelman
Thanks and Good Luck!!

THAT’S MY PLAN. I’D LIKE TO THANK ALL OF YOU FOR YOUR UTTER APATHY.

A FEW OF YOU STAYED AWAKE, AND I THINK I GOT SOME ACCIDENTAL EYE CONTACT ONCE WHEN THE A.C. MADE A NOISE.

IN CONCLUSION, I HATE MY JOB, I HATE MY COWORKERS, AND I HOPE FERAL CATS EAT EVERY ONE OF YOU.

THE END

For pointers to books, slides, sites, ...

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Some references

**Good Books**
- “A PhD is not Enough”, Feibelman
- “Mastering your PhD”, Gosling & Noordman
- “How to Get a PhD”, Philips & Pu

**Informative Sites**
- http://matt.might.net/articles/
- http://public.randomnotes.org/richard/

**Great Slides**
- Sue Moon “A few tips I wish I had before I met my advisor”
- Yannis Smaragdakis “PhD Rants and Raves – be afraid, be very afraid”
- Eamonn Keogh “How to do good data mining research, get it published, and get it cited”

**Google [title] filetype:pdf**
- “From Research to Manuscript”, Katz
- “Scientific Writing”, Peat
- “Writing for Science”, Goldbort

**Funny Sites**
- Research in Progress – researchinprogress.tumblr
- Piled Higher & Deeper – phdcomics.com

Special thanks to **Ingmar Weber** for his **excellent** talk
- “Advice for young Jedi knights and PhD students” at PIKM 2012