

# Piled Higher and Deeper *by Jorge Cham*

www.phdcomics.com



DO YOU OFTEN FEEL DEPRESSED, AND UNABLE TO GET MOTIVATED ABOUT ANYTHING EXCEPT CHECKING YOUR EMAIL?



DO YOU SUFFER FROM FREQUENT ANXIETY ATTACKS OVER THE LACK OF MEANING IN YOUR LIFE?



DO YOU EXPERIENCE FREQUENT HEAD-ACHES TRYING TO COUNT HOW MANY YEARS YOU'VE BEEN IN SCHOOL?



JORGE CHAM © 2002

THEN YOU ARE AMONG THE MILLIONS OF YOUNG ADULTS THAT SUFFER FROM "POST-BACHELOR DISORDER", OTHERWISE KNOWN AS "GRAD SCHOOL".

NOW THERE IS A CURE.

The following is a paid advertising. The views expressed here do not necessarily reflect the views of this comic strip. www.phdcomics.com

title: "Post-Bachelors Disorder" - originally published 9/30/2002

# HOW TO BE A SUCCESSFUL GRADUATE STUDENT

IT WAS THE BEST OF TIMES,  
IT WAS THE WORST OF TIMES

ONE EX-STUDENT'S INSIGHT ON HOW TO GET THROUGH  
GRADUATE SCHOOL AND FIND A JOB

*(and get the <sup>^</sup> most out of)*

ED GERBER  
SEPTEMBER 2018



# THE TAKE HOME

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Ask, and it shall be given you;

seek, and ye shall find;

knock, and it shall be opened unto you.

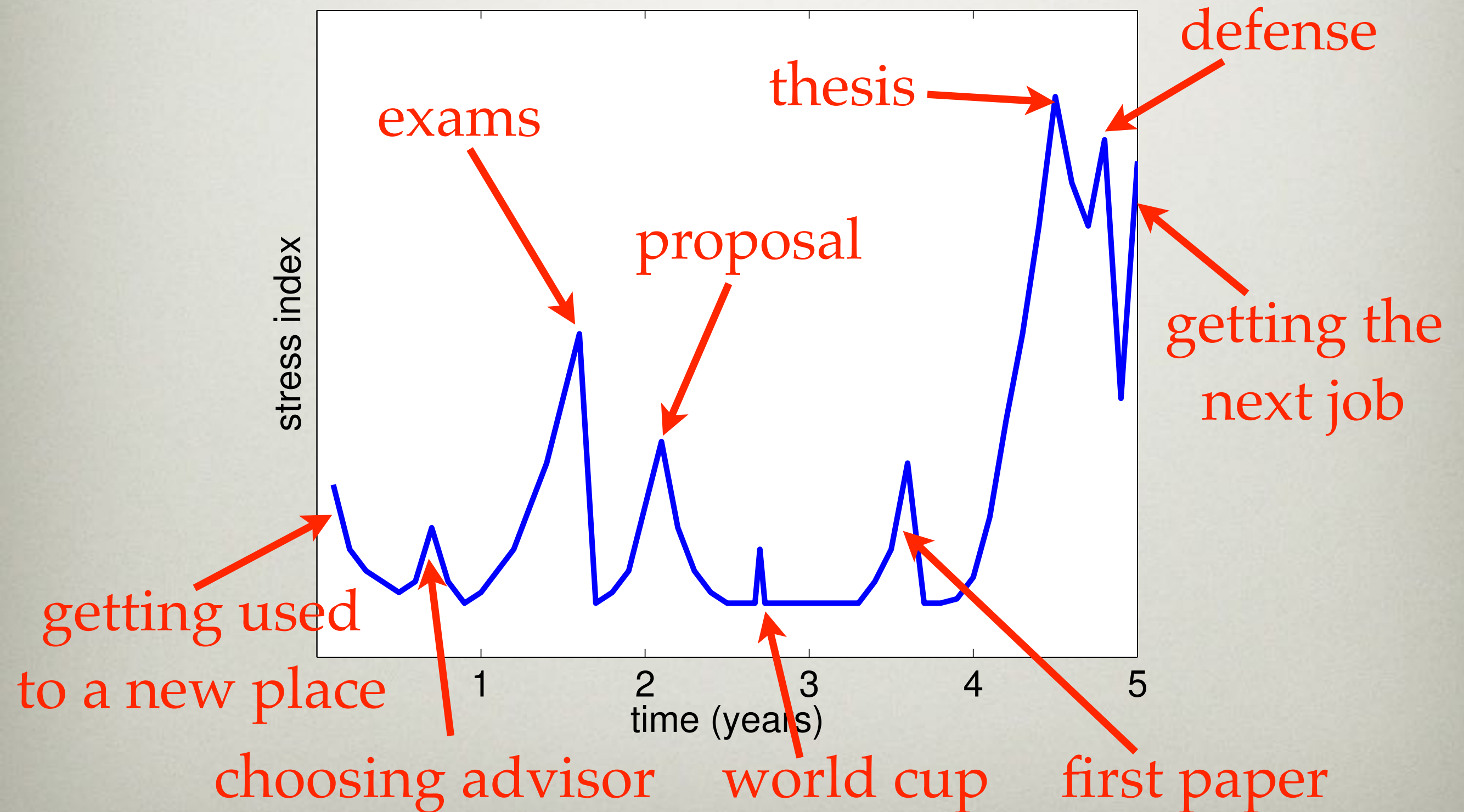
i.e. **Take charge of your education and research**

# TAKE ADVANTAGE OF THE COURANT!

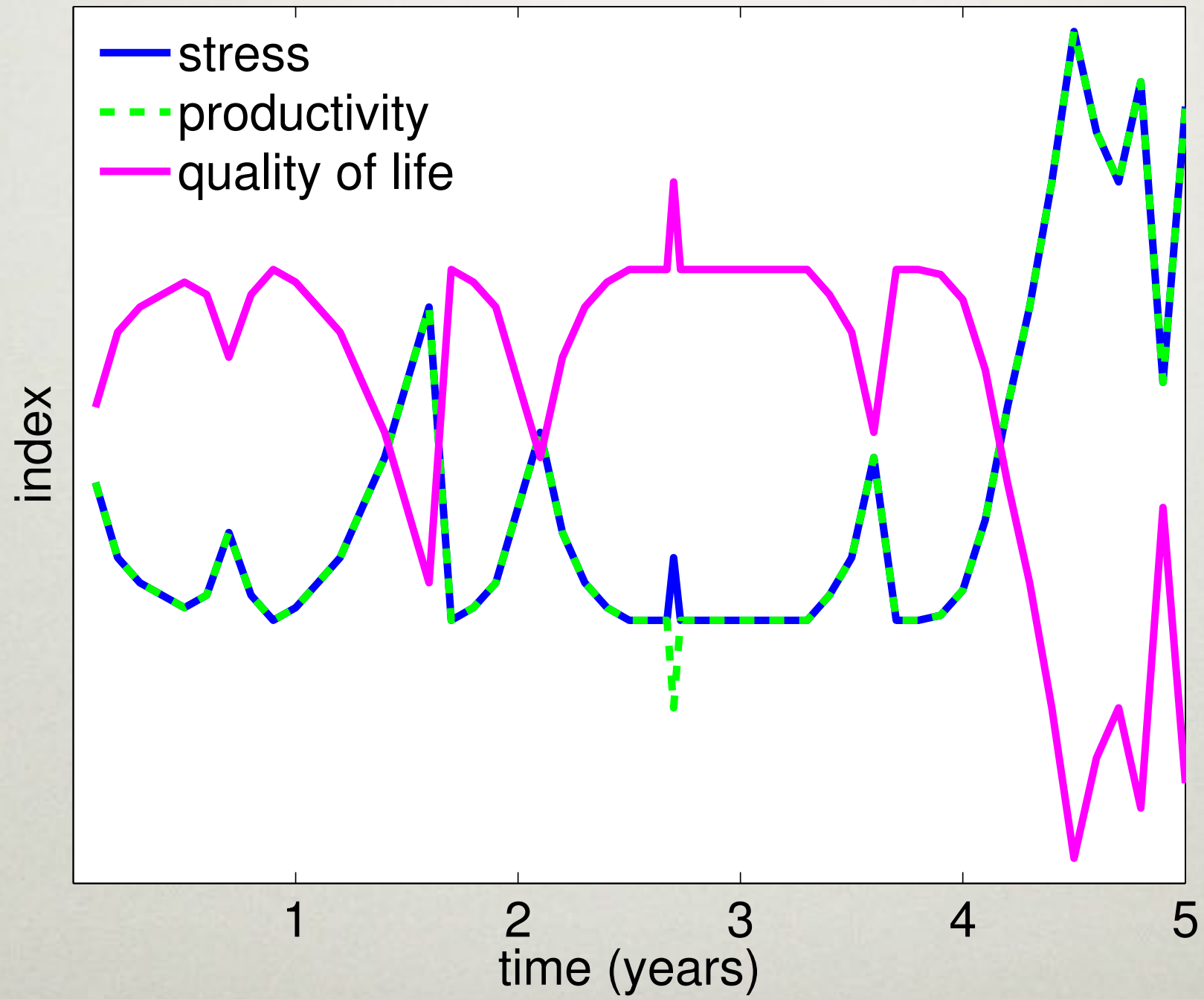
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- Much of your graduate work will be done alone. Grad school is about establishing your independence, but . . .
- you are in a top-flight institution with so many resources
  - ◆ faculty
  - ◆ research scientists, staff, postdocs, . . .
  - ◆ your fellow students

# THE GRAD SCHOOL STRESS CURVE (OUTLINE)



# OTHER CURVES





# THE ADVISOR



title: "By 'we' you mean..." - originally published 3/1/2004

# INTERACTIONS WITH YOUR ADVISOR

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- What do you want to do?
- Communication. (Famous and busy? Younger, but more accessible?)
- Know your needs and limitations
  - If your advisor says nothing, does that mean you're doing well, or doing poorly?
- Tenured?
- Speak to current graduate students!!!!!!

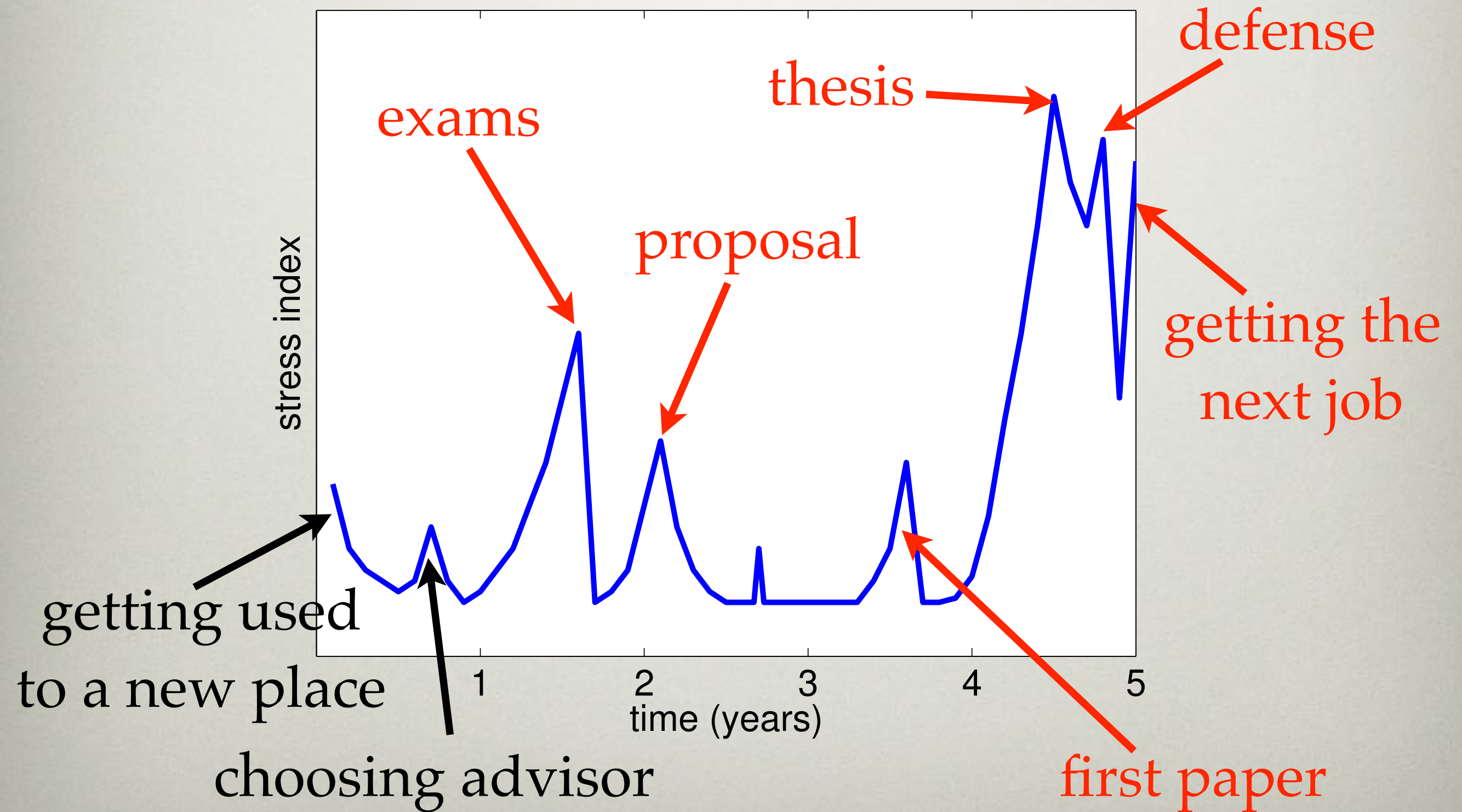


# EXPECTATIONS

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- What does your advisor expect of you?  
(Ask him/her!!!!!!)
  - ◆ background
  - ◆ teaching / research
- What do you expect from your advisor?
  - ◆ mentoring
  - ◆ hands on / hands off
  - ◆ feedback?

# THE STRESS CURVE



# GETTING THROUGH THE EXAMS



JORGE CHAM ©THE STANFORD DAILY

title: "Quals" - originally published 1/11/1998



# GETTING THROUGH THE EXAMS

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- Know the requirements
- Get advice (from professors *and* students)
- Plan courses appropriately
- Practice, practice, practice

# GETTING THROUGH THE EXAMS

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Simulate an oral exam with your friends;  
note that chalk has been clinically proven  
to disrupt higher order brain function!

# TAKE CHARGE OF YOUR EXAMS (THEY'RE NOT ALL BAD)

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- Can you shift the topic of your exams to meet the things you are interested in?
- Exam topics can be a spring board for your thesis research
- Do certain professors inspire you? Get them on your committee!



# THE PROJECT/PROPOSAL!



JORGE CHAM ©THE STANFORD DAILY

title: "Thesis topic - Epiphany" - originally published 10/9/1998

# SELECTING A PROJECT

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- Does this topic excite you?
- Pick the low fruit!
- Avoid delusions of grandeur
- It's a thesis, not your life
- Get advice!
- Does this topic *really* excite you?

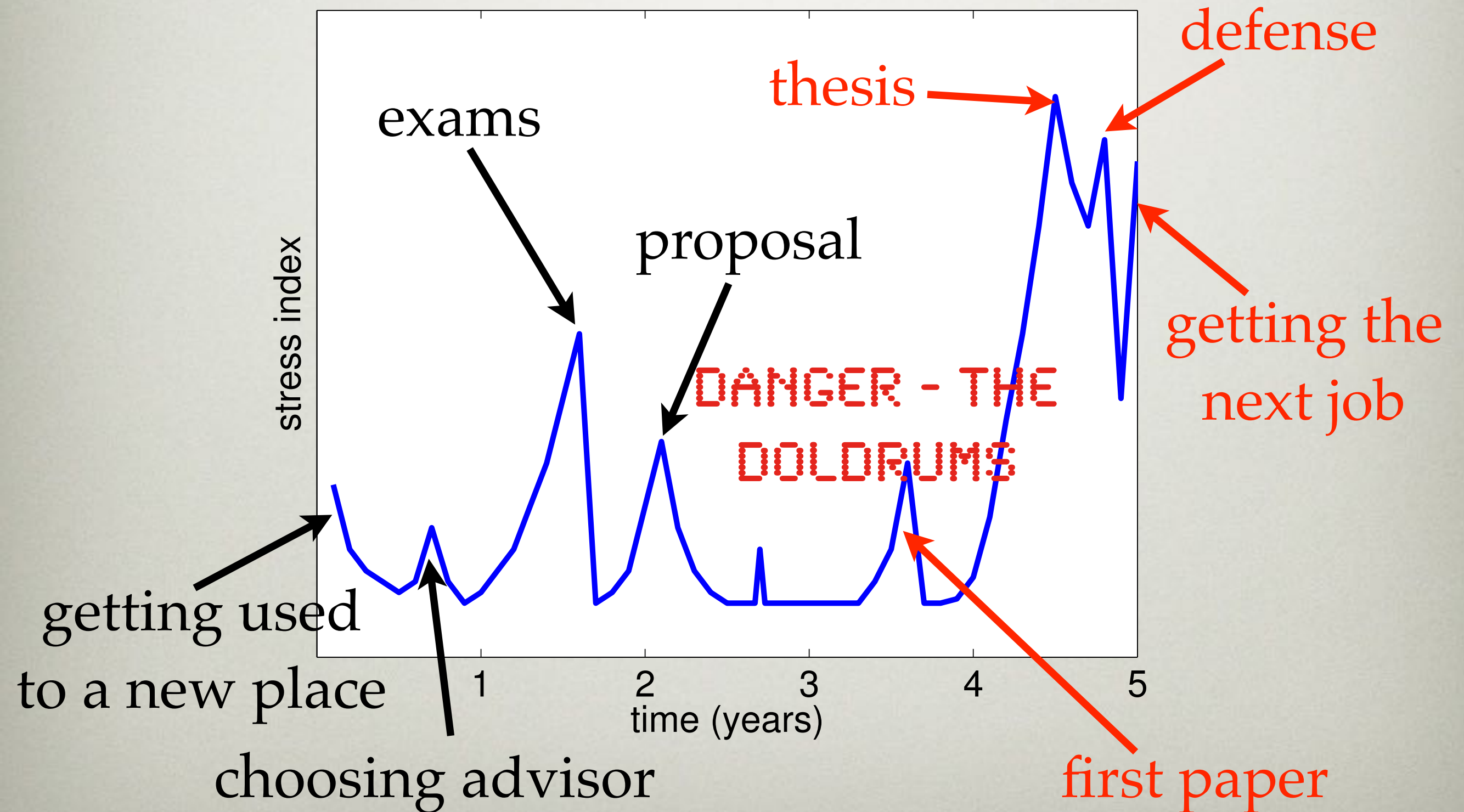
# THE PROPOSAL

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- Know the literature
  - What has been done? Is this new?
  - Is this interesting? Is it publishable?
  - Where does it fit in the big picture?
- What do you reasonably expect to happen?
- Can this be completed in c. 3 years?
- Does the technology exist? Funding?



# RETURNING TO THE STRESS CURVE



# THE DOLDRUMS

## Living with P.Q.S.



Brought to you by:



the National Council for  
Graduate Student Mental  
Health

### What is PQS?

"Post-Quals Slump", or PQS, affects 99% of all grad students. It is the #1 cause of delayed graduation dates and contributes to the Ph. D. degree drop-rate.

### What are the symptoms of PQS?

Symptoms include:

- Inability to maintain interest in research area
- Advisor Avoidance
- Increased web-surfing
- Healthy sleeping pattern
- Cynicism towards Academia

### How long does PQS last?

PQS is incurable. With proper treatment, its main symptoms may last up to 5 years.

### How do I treat PQS?

Experimental treatments such as Advisor-Pressure (AP), Spousal-Income-Frustration (SIF), Lack-of-Savings-Realization (LSR) and "cocktails" of these have known to cause a remission of the disease long enough to at least defend a thesis. More severe treatments are required to actually finish writing the thesis

# DOLDRUMS

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- Take charge - don't expect your advisor to pull you out
- Get involved - reading groups, conferences, seminars
- Set short term goals
- Set a regular schedule
- Seek advice: students / postdocs / faculty



# PUBLISHING YOUR FIRST PAPER



[www.phdcomics.com](http://www.phdcomics.com)

title: "Our work is like this donut" - originally published 4/5/2004

# PUBLISHING YOUR FIRST PAPER

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- Know the expectations from the journal
- work with your advisor
- many will read only the abstract, intro, and conclusions
- brevity is the soul of wit
- document your work - reproducibility
- what is the main message in your paper

# ACADEMESE

## DECIPHERING ACADEMESE

YES, ACADEMIC LANGUAGE CAN BE OBTUSE, ABSTRUSE AND DOWNRIGHT DAEDAL. FOR YOUR CONVENIENCE, WE PRESENT A SHORT THESAURUS OF COMMON ACADEMIC PHRASES

"To the best of the author's knowledge..."

=

"WE WERE TOO LAZY TO DO A REAL LITERATURE SEARCH."

"Results were found through direct experimentation."

=

"WE PLAYED AROUND WITH IT UNTIL IT WORKED."

"The data agreed quite well with the predicted model."

=

"IF YOU TURN THE PAGE UPSIDE DOWN AND SQUINT, IT DOESN'T LOOK TOO DIFFERENT."

"It should be noted that..."

=

"OK, SO MY EXPERIMENTS WEREN'T PERFECT. ARE YOU HAPPY NOW??"

"These results suggest that..."

=

"IF WE TAKE A HUGE LEAP IN REASONING, WE CAN GET MORE MILEAGE OUT OF OUR DATA..."

"Future work will focus on..."

=

"YES, WE KNOW THERE IS A BIG FLAW, BUT WE PROMISE WE'LL GET TO IT SOMEDAY."

"...remains an open question."

=

"WE HAVE NO CLUE EITHER."



# NUTS AND BOLTS

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- LaTeX
  - Steep learning curve - ask someone for help when starting up!
  - Very powerful, great for equations
- Word
  - Easier to pick up
  - not as flexible / stable
- In either case, find a template!

# PRESENTATION SKILLS

- Top quality research papers are a necessary condition for career advancement,
- but not sufficient: you need to be able to present your work
- But this is not a good slide. In fact, it's terrible!
- Why is the font size so small all the sudden?
- Why is there a distracting icon at the bottom?
- It's generally not a good idea to just copy figures right from your paper. Make sure people can read the axes and legends.
- You don't want it to appear that you just copied this out of a paper last night.
- Why am I reading this verbatim? I should have put down the most important parts in type, but then explained them to the you in my own words.
- Not scuh a great job wit the proofreadin either, eh? (Don't stress too much about this!)
- What does that equation mean? This is a very diverse audience who might not be familiar with the pseudomomentum equation.
- There are too many bullets on this slide ... and what the \$#@% is pseudomomentum?

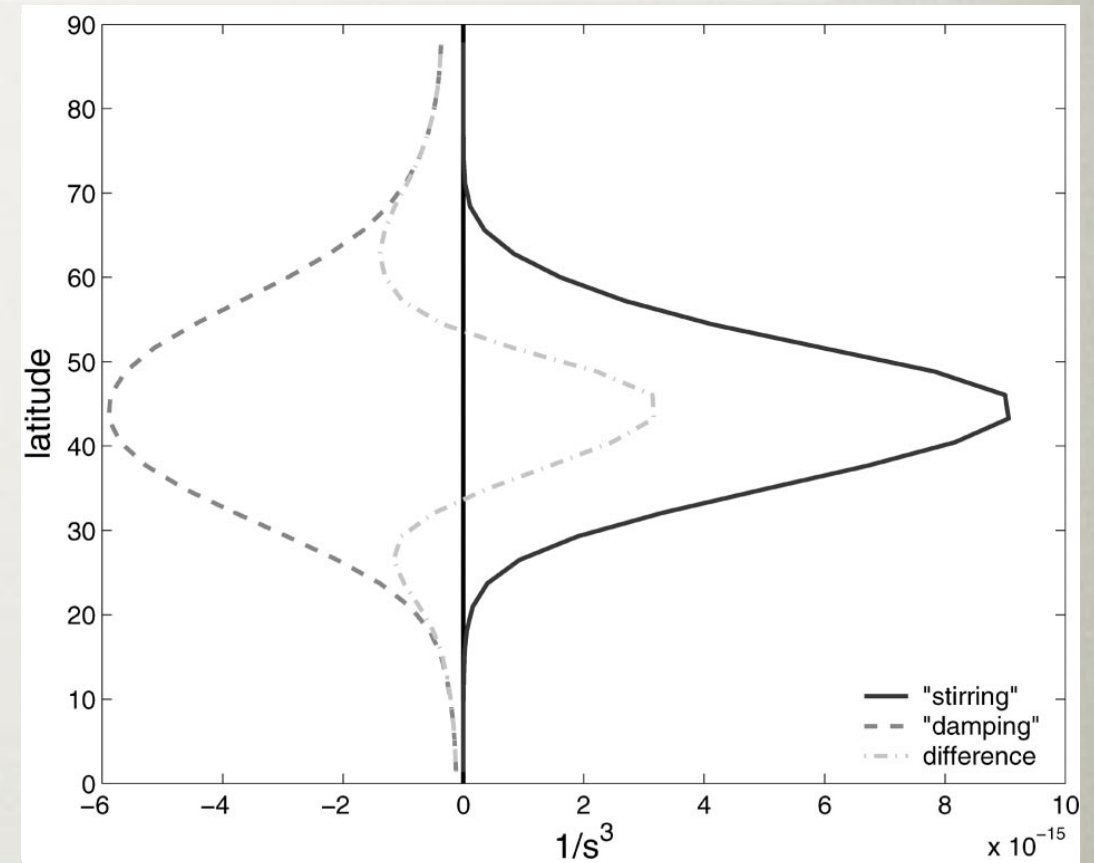
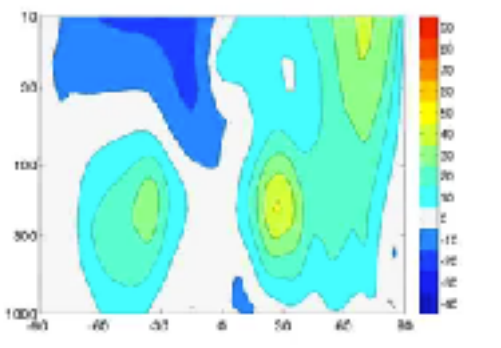


FIG. 3. The pseudomomentum stirring  $\overline{F'_\zeta \zeta'}$  and dissipation  $\overline{D'_\zeta \zeta'}$  and their sum [see Eq. (2.10)] for Z1. The distribution of dissipation is broader than the forcing, resulting in an eastward jet where the stirring is centered, with westward flow on the flanks.



$$\frac{\partial \bar{u}}{\partial t} - \frac{\partial M}{\partial t} = -r\bar{u} + \frac{1}{\gamma} (\overline{\zeta' F'_\zeta} - \overline{\zeta' D'_\zeta})$$

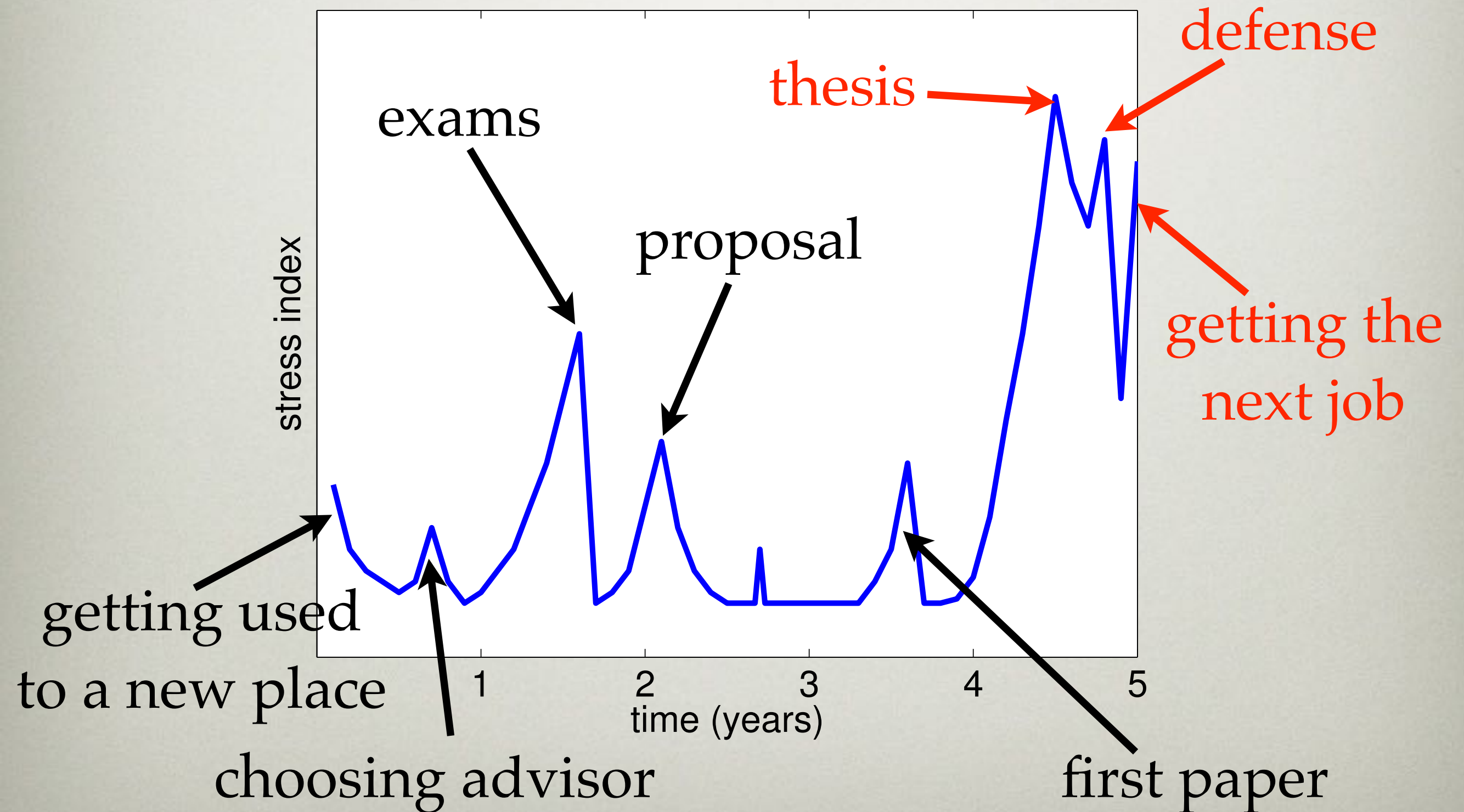
# PRESENTATION SKILLS

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- Know your audience: the rule of thirds
  - everyone should understand at least  $1/3$  of your talk
  - $2/3$  of the audience should understand at least  $2/3$  of the talk
  - At least  $1/3$  the audience should understand everything
- Remember: talks are “advertisements” for the papers! **You cannot fully explain 1 year of your work in 45 minutes (let alone 12!)**



# RETURNING TO THE STRESS CURVE



# FINISHING THE THESIS



title: "I am a writing god!" - originally published 1/29/2003

# FINISHING THE THESIS

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- Publish your research early:  
one paper=one chapter
- Remember: No one will read your thesis . . . but make sure it won't embarrass you in case they do!
- For unpublished work:  
one chapter = one paper

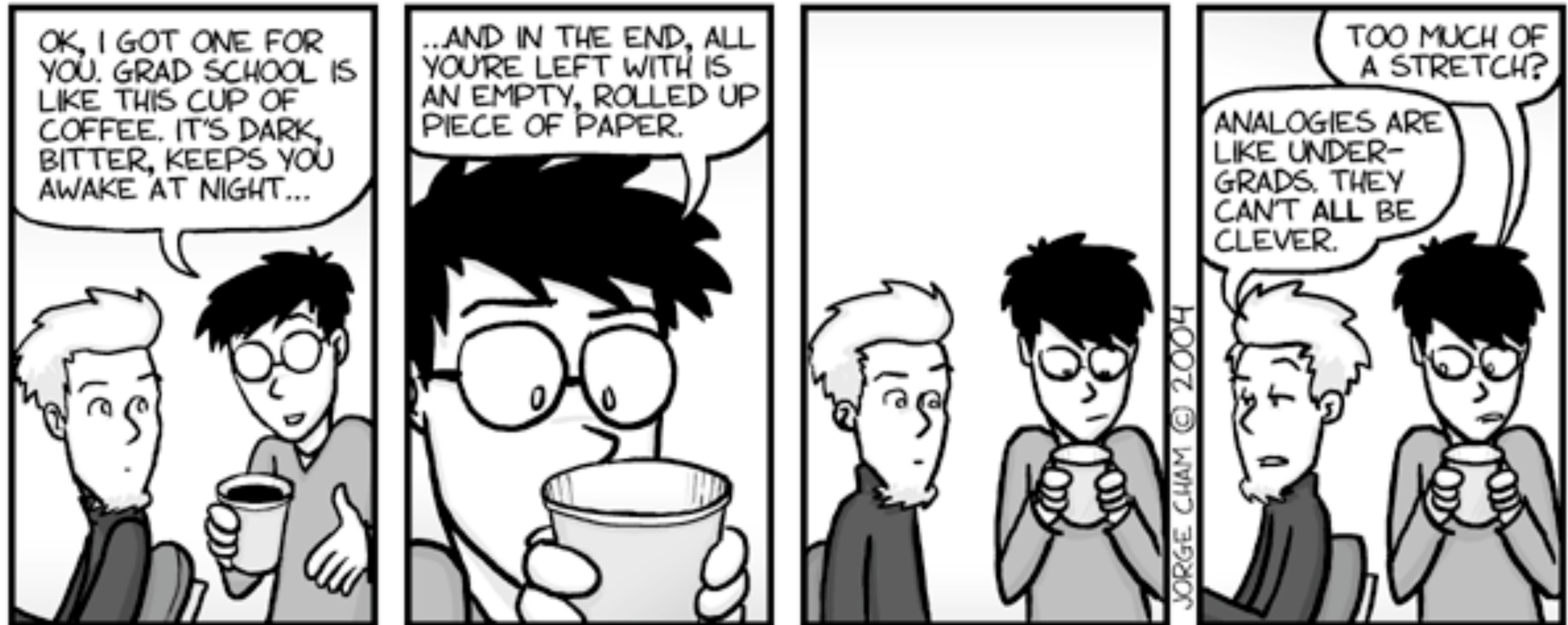


# FINISHING THE THESIS

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- In the end, you need to get it done
- Writing groups
- Get away from distractions; go to NYU Paris, Berlin, etc., if that is what it takes!
- Keep perspective

# TOUGH TIMES



[www.phdcomics.com](http://www.phdcomics.com)

title: "Our work is like this donut" - originally published 4/7/2004

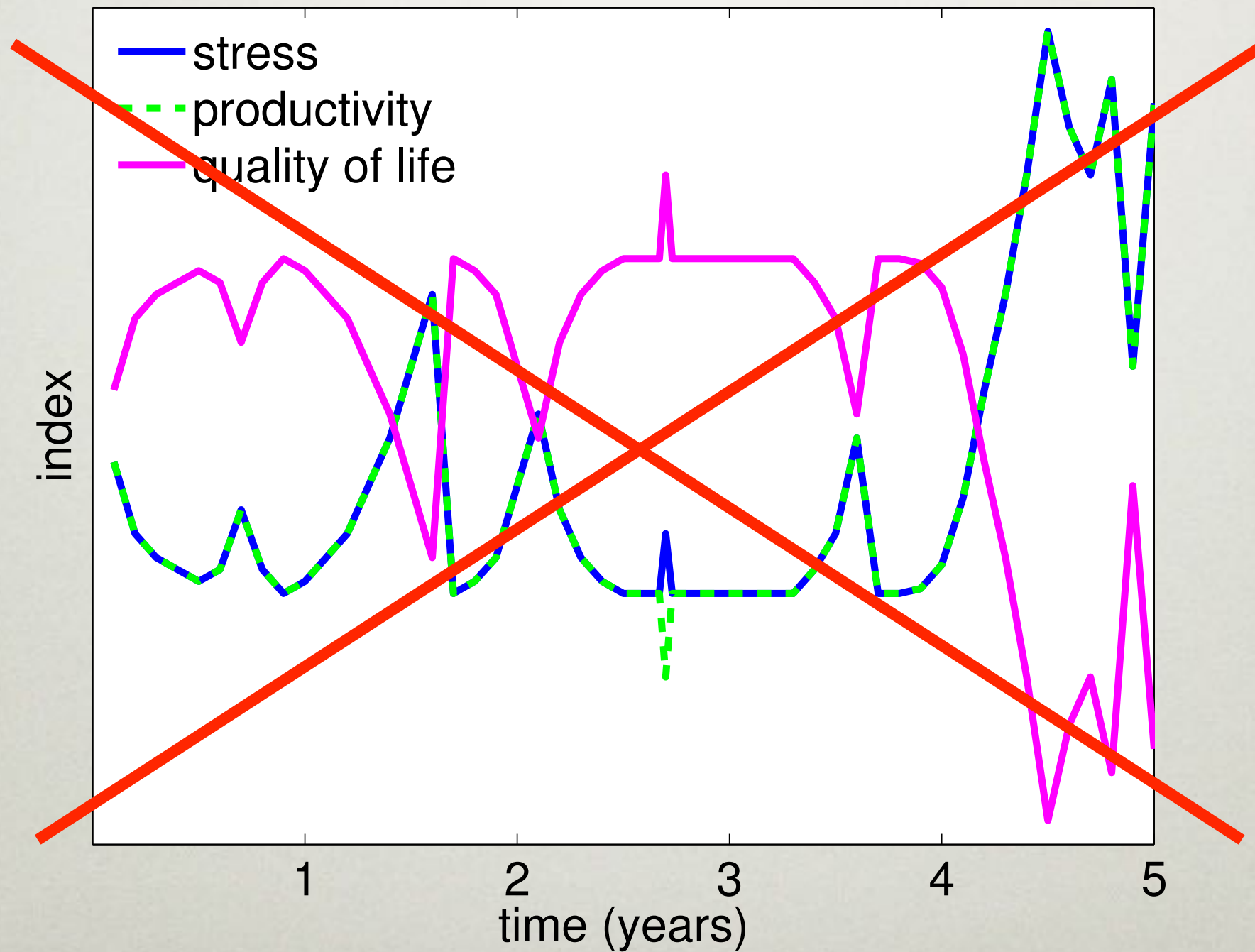
# STRESS MANAGEMENT

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- Balance your work load
- Law of diminishing returns

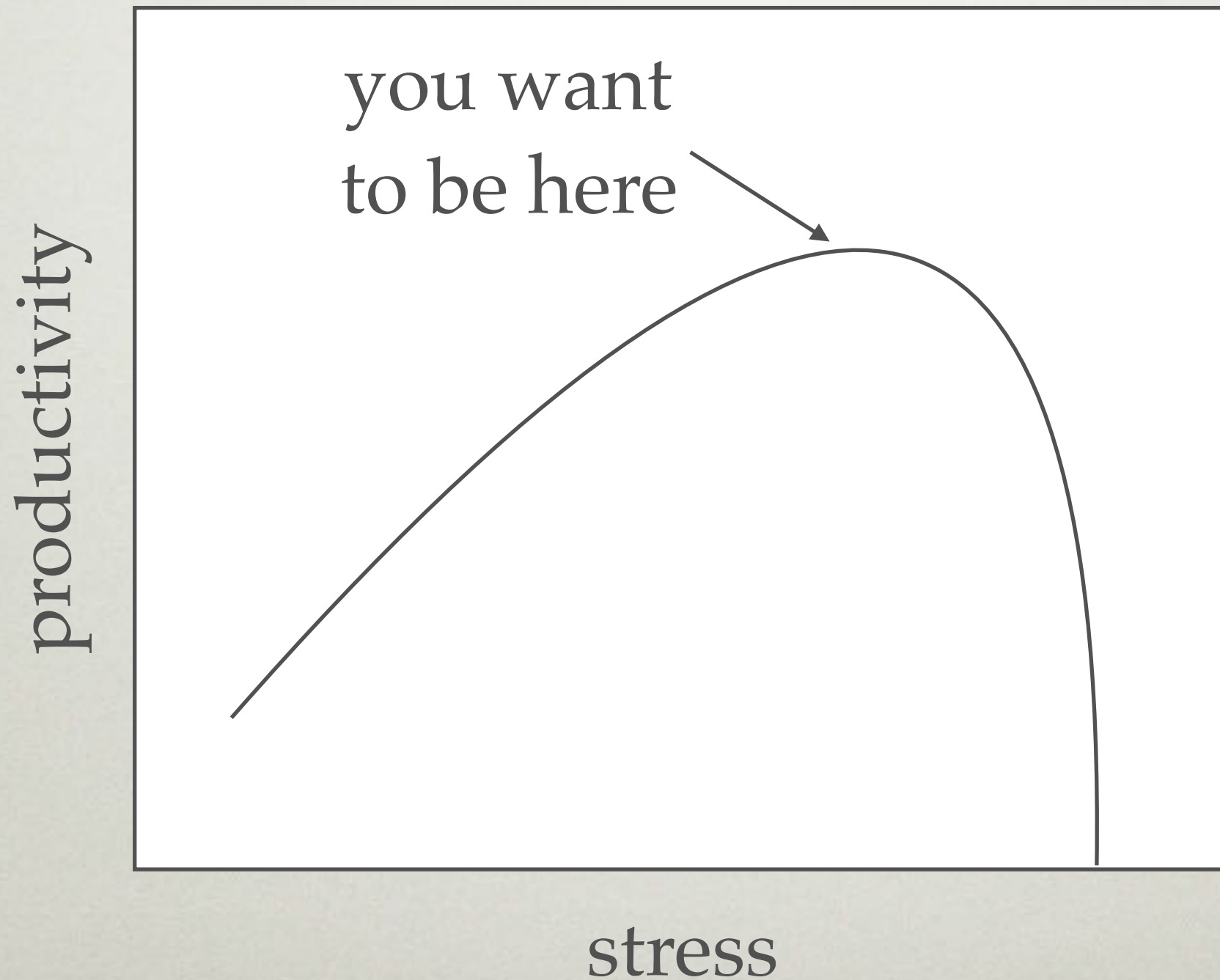


# STRESS DECORRELATES FROM PRODUCTIVITY AT HIGH LEVELS



# STRESS DECORRELATES FROM PRODUCTIVITY AT HIGH LEVELS

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# STRESS MANAGEMENT

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- Balance your work load
- Law of diminishing returns
- Balance your life
  - volunteering: make difference outside of the ivory tower!
  - arts (you in the City of New York!)
  - exercise (I run ... )



# KNOW WHEN TO GET HELP

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- Graduate school can be isolating
- Self-doubt - you've studied this stuff so long, it all seems obvious. But that's because you've looked at it so much.
- You have more options than you think
- Depression will cloud your perspective, prevent you from working effectively

<https://www.nyu.edu/students/health-and-wellness/student-health-center.html>

<https://www.nyu.edu/students/health-and-wellness/wellness-exchange.html>

# COMMUNICATION

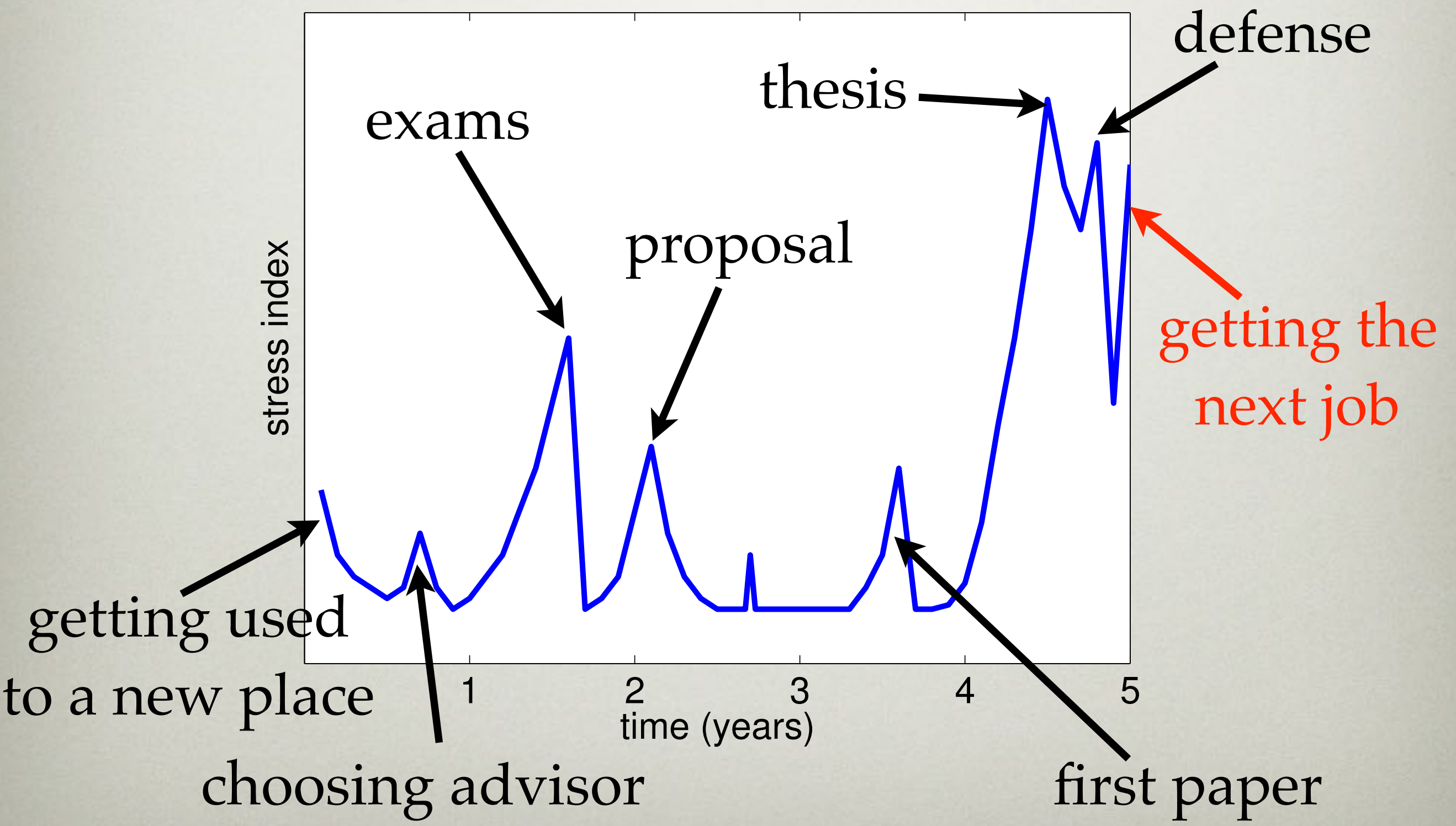
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- If you are ill, or overwhelmed by something outside of research, it is important to let your advisor know. *You do not have to share details.*

I once had a student who was suffering from a serious illness. I did not know and thought they were being lazy: I only realized the situation when I pushed hard on research. **I regret not knowing sooner.**

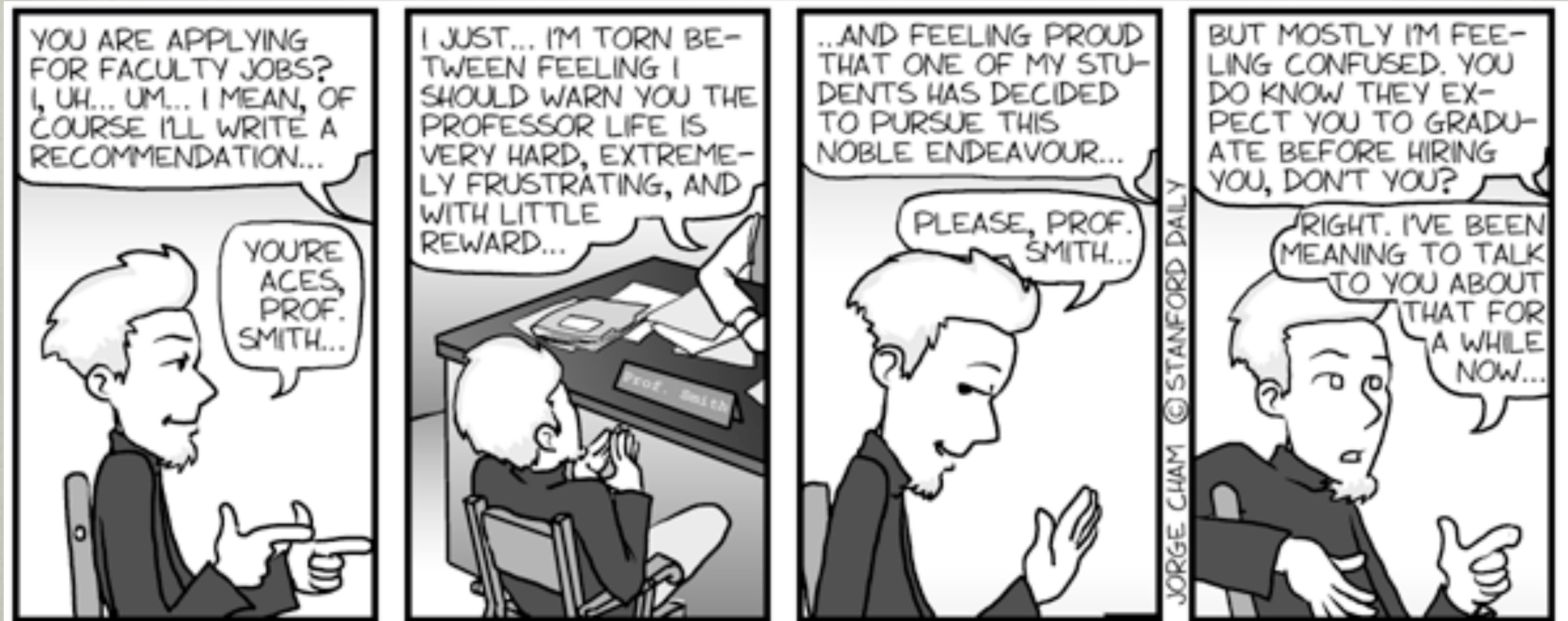
- If not your advisor, please reach out to your DGS or another faculty member.

# ALMOST DONE!!





# GETTING A JOB



phd.stanford.edu

title: "Faculty Job Search" - originally published 4/3/2002

# GETTING A JOB

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- Industry
- Academic
- National Labs
- Postdocs
- Fellowships- general (NSF / DOE) and specific to your field

# POSTDOCS

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- mathematics
  - support from teaching funds
  - fixed schedule, deadlines, decisions
- applied programs
  - research funding
  - more informal, contact people directly
- Fellowships



# JOB INTERVIEWS

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- Know your audience.
- Practice your talk. Get advice. [Advisor]
  - Don't feel compelled to show everything (avoid "shock and awe")
  - Present one result very well.
- Be ready to talk to non-experts:
  - How does your work fit in big picture?
  - Show interest in their work
- Know your audience.

# IN CONCLUSION

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- Take charge of your research!
  - Talk with profs / students / postdocs!
  - Try your best to keep balanced.
  - Graduate!!!!
- 
- Thanks to my advisors and mentors,  
Geoff Vallis and Lorenzo Polvani



# SIGNS YOU'RE CLOSE TO GRADUATING

PHD.STANFORD.EDU  
JORGE CHAM © THE STANFORD DAILY



title: "Signs you're close to graduating" - originally published 3/8/2002

Also, please see:

<http://www.cns.nyu.edu/events/growingupinscience/index.html>

a continuing program on the graduate student experience hosted by the Center for Neural Science!