

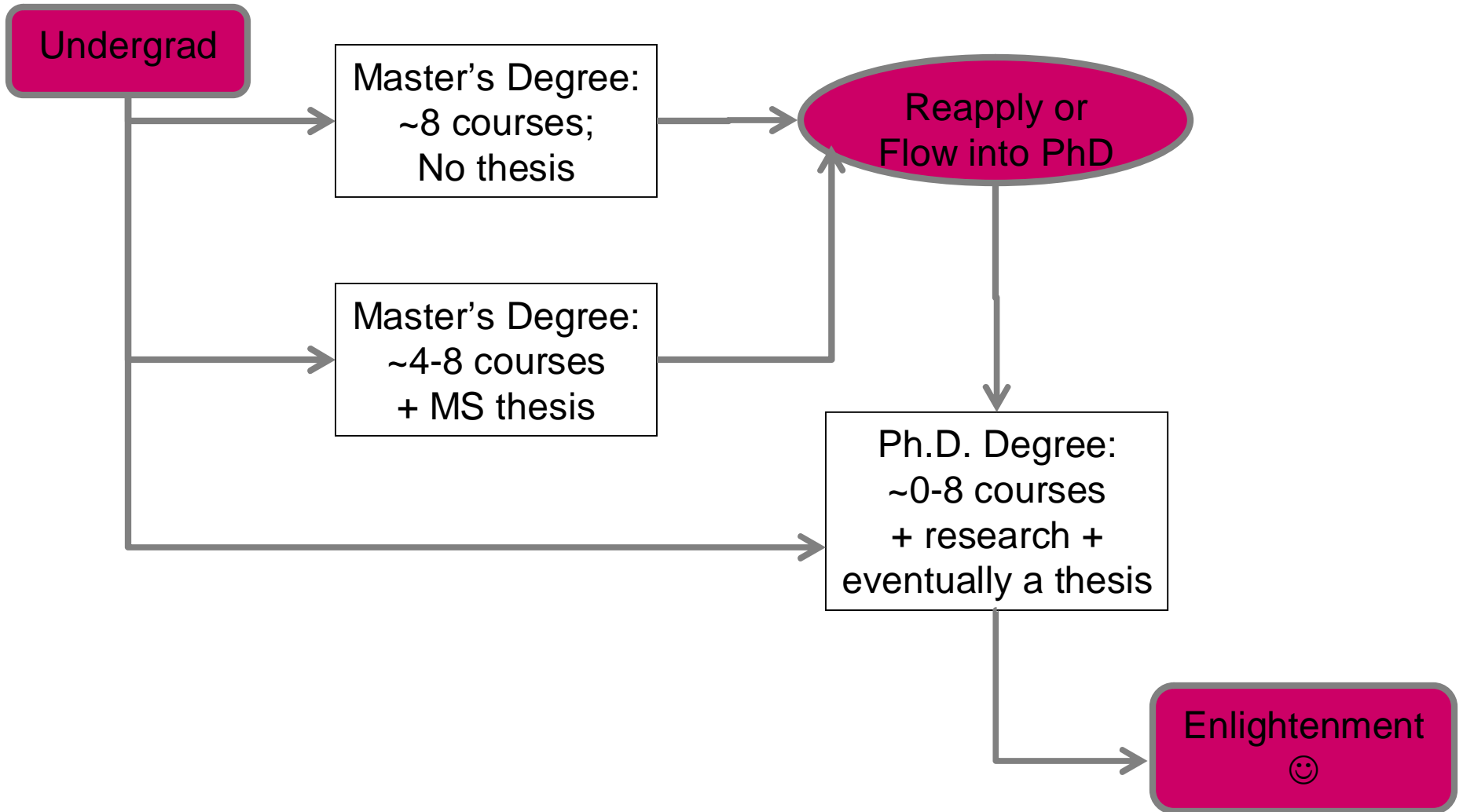


What is Graduate School: Goals and Skills

Margaret Martonosi, Princeton University
Krasimira Kapitanova, U. Virginia



What is grad school?





Course-Based Master's Degree

- Not that different from undergrad
- Select courses to match your interests
 - And, do well in your courses
- Be ready for a quick ride:
 - Strategize to get the most from your program while it lasts.
 - 1 year program => job-hunt soon after arrival
 - Cultivate & extend professional network
 - Reference letters? Future PhD advisers?



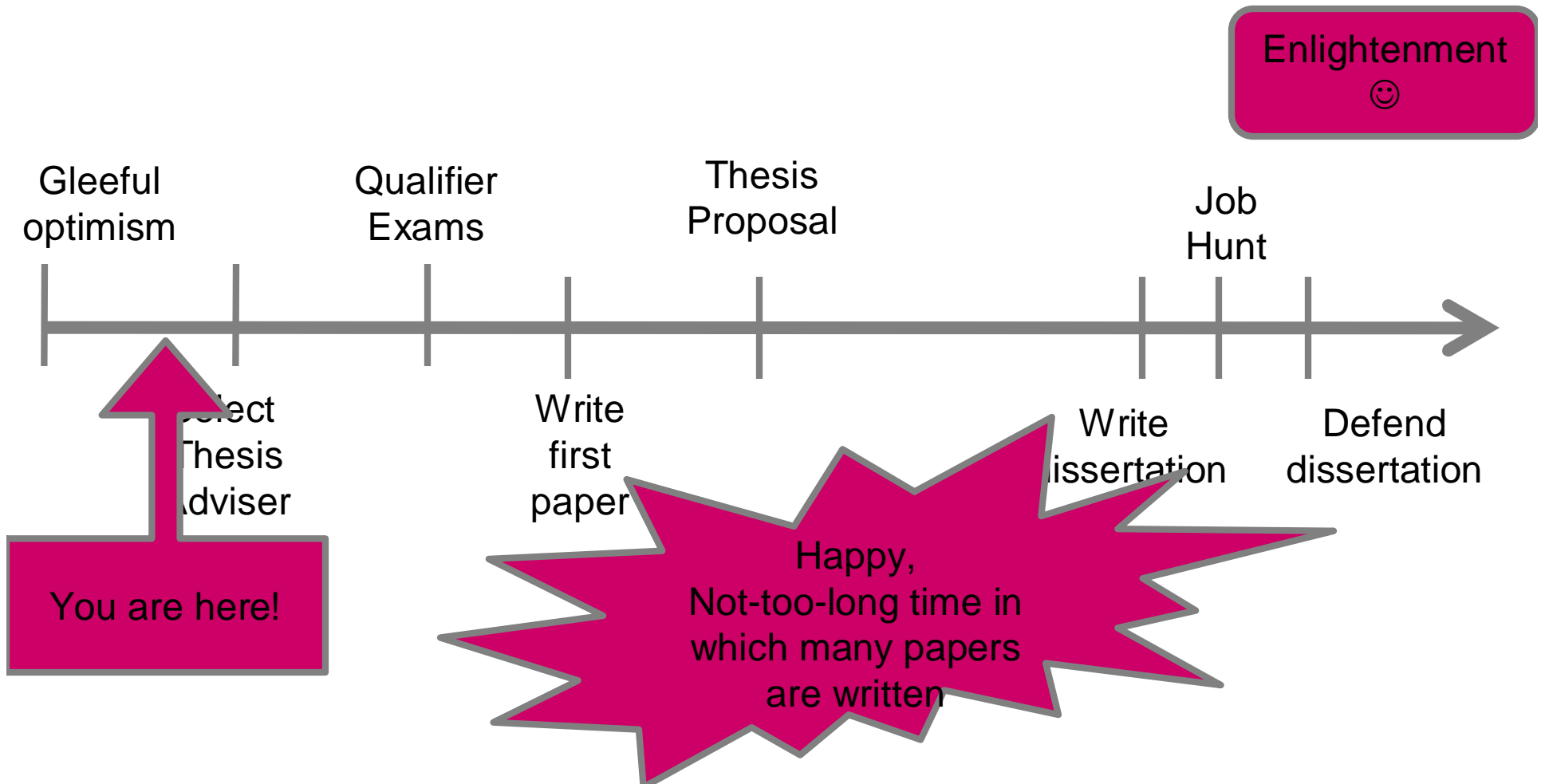


Research-Based Master's Degree

- Hybrid of undergrad & PhD:
 - Take courses
 - Select adviser & do thesis project
- Research component is similar to PhD but...
 - May be more “development” rather than innovative & deep independent research
 - May result in 0-1 published papers, rather than 3 or more papers
 - Choices (of adviser, project, etc.) have lower stakes-you’re committing to 1-1.5 years, rather than ~5.



A Happy Ph.D. Timeline



● ● ● | Selecting a Thesis Adviser

- There's a whole session on this topic
 - It's **that** important!
- Our short version:
 - A technical topic match is important
 - But it's also important that you can work with this person for **years**!
 - Does their style match yours?
 - Accessibility? Independence? Treatment of students in their group? Time-to-graduation?



Prepping for Qualifying Exams



- Very school-specific, but general advice is:
 - Find out from veteran students how your school's system works.
 - Sometimes students don't have the full story: ask your adviser too.
 - Ask your department to give out prior versions of the exam for study purposes
 - Form a network: share questions or study with others. (But put in time on your own, also)



Setting Research Goals

- PhD Research requires redefining success
 - Class performance is not as important as before
- In research, nobody knows the answer!
 - And half the challenge is in asking good questions!



- You're in the pilot seat
 - not yet sure of your destination
 - need a capable crew to help you fly
 - Network, mentors, friends.



Progressing in Research

How to choose good problems

- Relax: your adviser often gives you first research problem.
- Balance: concrete enough to make progress ↔ far-reaching enough to be research.
- Read: In other papers, think of what the authors didn't do.
- Notice: challenges that make your research hard. These may be future research opportunities.

How to make progress

- Break the big problem into steps
- Then break the first few steps into even more steps
- Eventually: a to-do list becomes a roadmap for what to accomplish each day.
- Use meetings with your adviser effectively: listen, take notes, follow-up.



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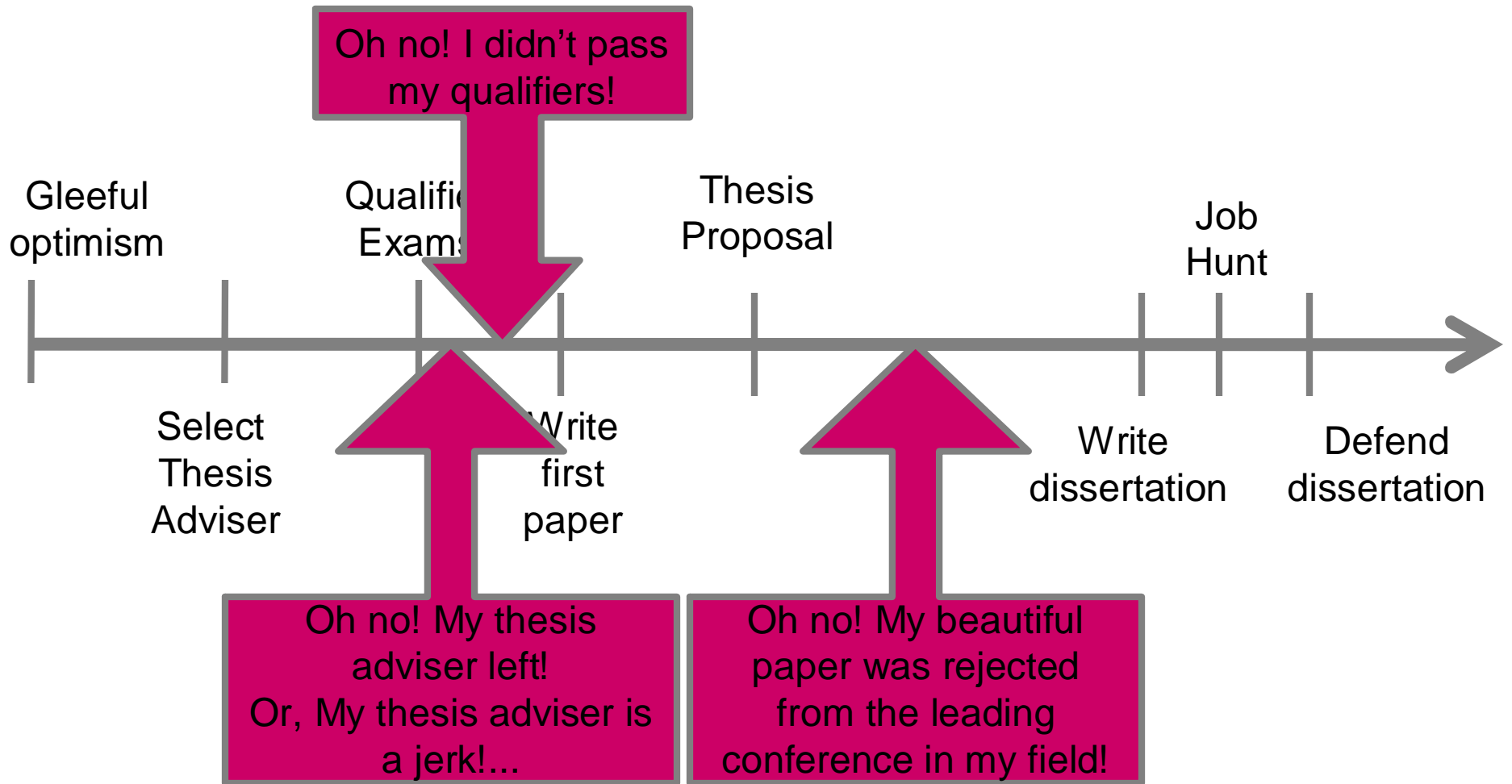
How to make progress

- Break problem into steps
- Take first few steps
- Do steps
- To-do list becomes a roadmap for what to accomplish each day.
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The real research challenge:
Remaining confident, effective
and happy while walking along an
unmarked path to an unknown
destination of unknown payoff !



Ph.D. Timeline: Another look...



- ● ● | When things go wrong #1: My adviser left!....

- Funding:

- Get a TA/instructor position
- Apply for fellowships (just in case!)



- Advisers:

- Don't make a rash re-selection. Work with someone as an interim before committing.

- Programs:

- Consider switching schools (with or without your adviser) if that's an option

When things go wrong #2:

● ● ● | I didn't pass my qualifying exams...

○ Talk o' others

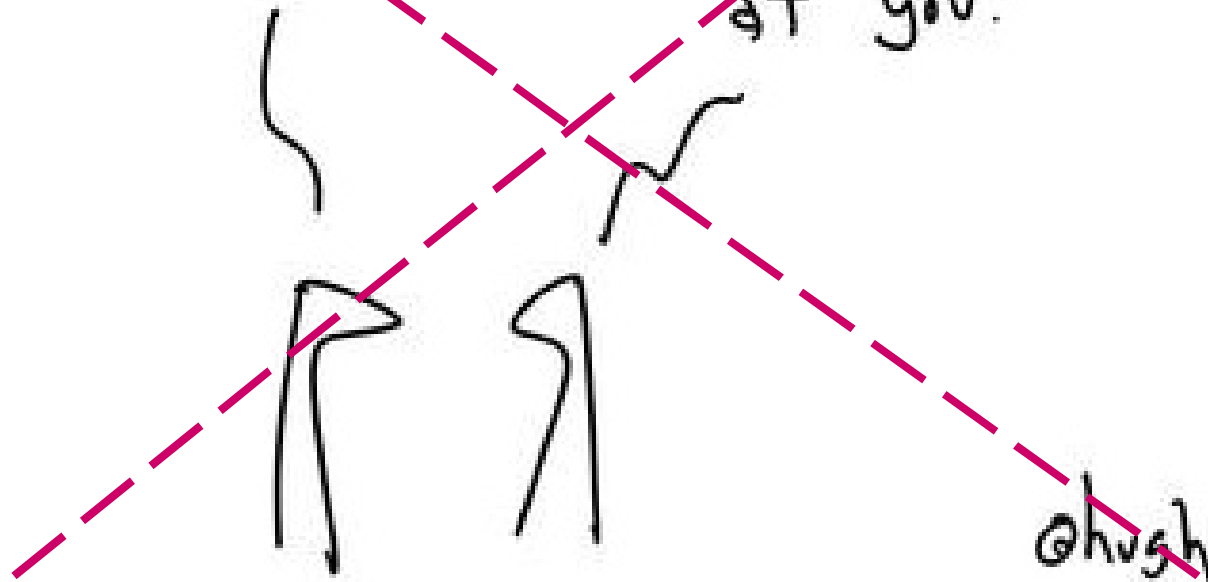
~~But what if I fail?~~

~~We all get to laugh at you.~~

○ In mos

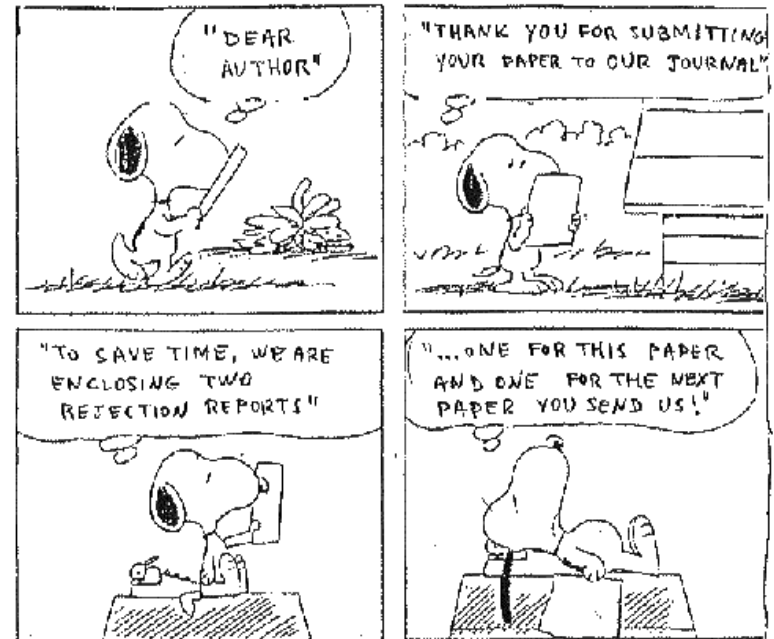
○ Don't \

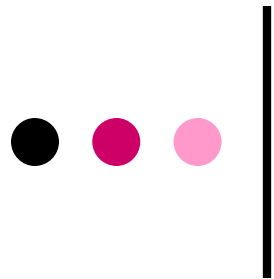
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When things go wrong #3: My paper was rejected...

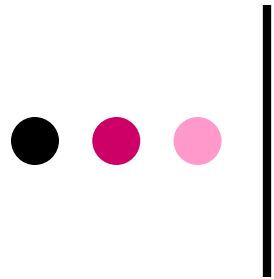
- Join the club!
 - It happens to *everyone*
- Put the reviews aside for one day, then read them and prioritize with your co-authors about how to change the paper.
 - Resubmit when the co-authors agree that the most important changes have been addressed.





When things go wrong #4: Family/health/personal issues

- Life goes on while you are in grad school, and things happen...
- Your adviser is often more forgiving of productivity gaps, if they understand the context
- Taking time off (leave of absence) is an option
- Many schools are instituting maternity leave policies



Be a believer

- Everyone loses confidence sometimes
- Find others who believe in you too
 - Believe them when they tell how you talented you are!
- Create your own best opportunities:
 - Ask about scholarships, travel awards,
 - Suggest paper deadlines
 - Be proactive: Help people help you by knowing what you need and asking for it!
- Celebrate each step forward!

*I am not
afraid of
storms for I
am learning
how to sail
my ship.*

Louisa May
Alcott



Resources

- CRA-W:

- www.cra-w.org

- CRA-W facebook site

- Events:

- Grad Cohort

- Discipline-specific Workshops

- You are now on the CRA-W alumnae email list---read the email you get!

- Research life & adviser/advisee success:

- March '09 CACM "Viewpoints" by Patterson & Ullman

- <http://science-professor.blogspot.com/>

- Other email lists: [systers,](#)

- www.phdcomics.com