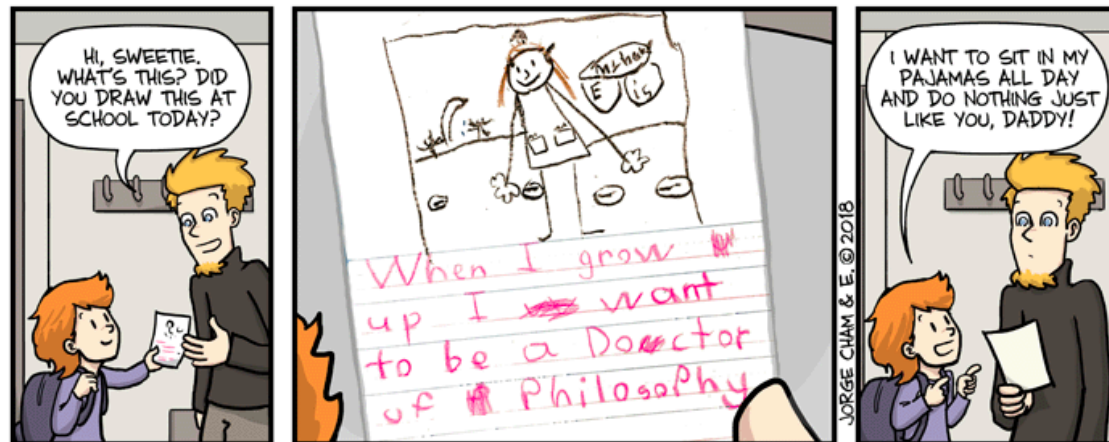


# Why (and why not) a Ph.D.?

To do ...

- ❑ What is a Ph.D.?
- ❑ What can you with one?
- ❑ How are you evaluated during and after?
- ❑ So, are you *sure* you want one?



# What is a Ph.D.? Recognized expertise

- Signifies the capability to conduct research
- Many positions (e.g., prof., research scientist, managers at govt labs, etc.) only hire Ph.D.'s
- Admittance into a community of experts in an “area”
- By the time you graduate, you will be a recognized expert in that area
  - Someone who knows more about some topic than anyone else in the world (not as hard as it sounds)

# What is a Ph.D? A lifestyle

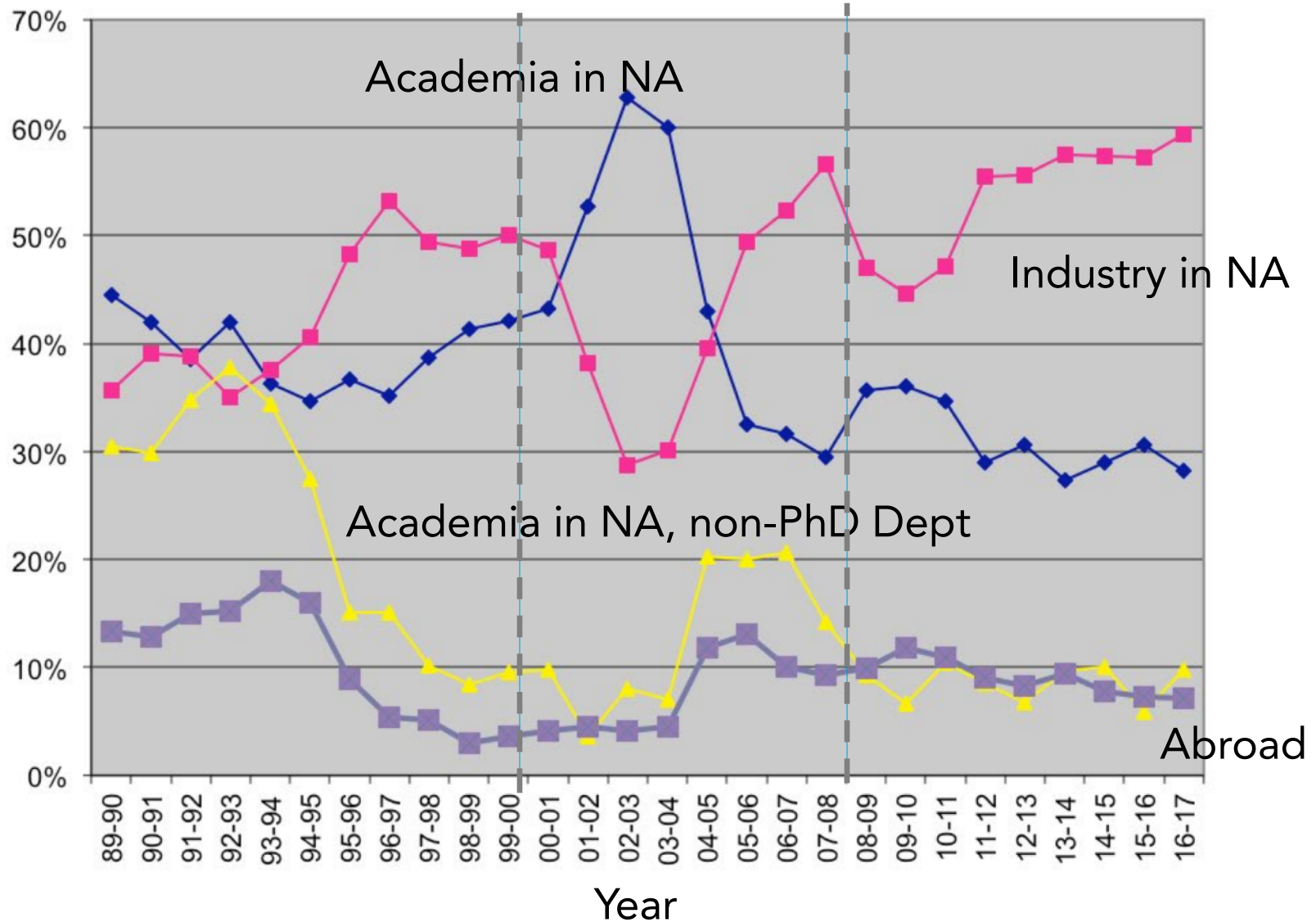
- To think for a living
- To make a large impact on something
- To be your own boss
  - Flexible hours, flexible pace, flexible topic
- To travel
- To constantly learn and attack new challenges
- To make decent money

# What can you do with your Ph.D.?

- Academia
  - Tenure-track faculty
  - Research or teaching faculty
  - Faculty at teaching university/college
- Industrial research lab
- National labs (government)
- Wall street
- Management consulting
- Start a company

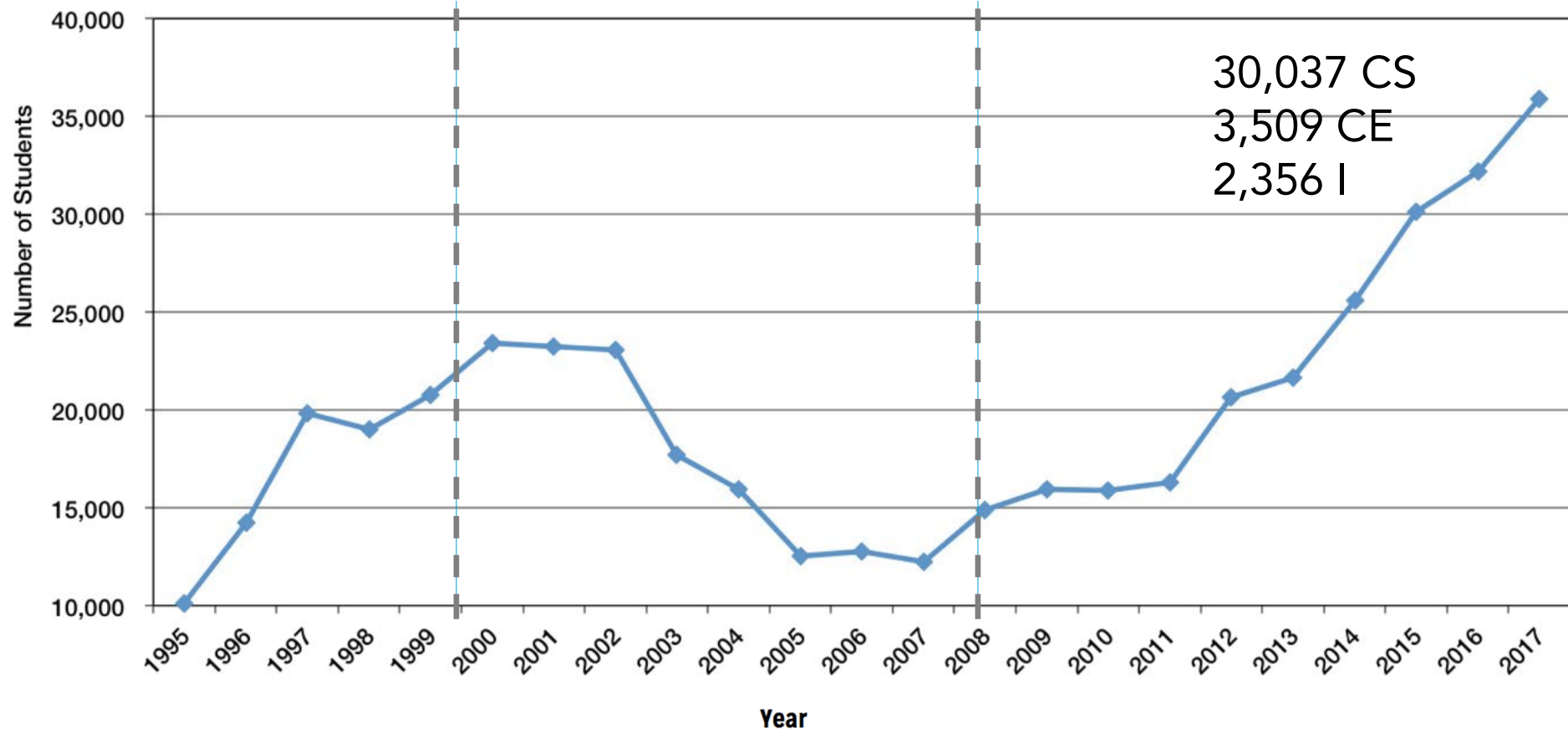
# Employment trends for new Ph.D.s

CRA Taulbee Survey 2017



# Newly declared UG majors (CS, CE, I)

CRA Taulbee Survey 2017



# What can you do without a Ph.D.?

- Many jobs – e.g., often Ph.D.s end up programming, or doing applied engineering, or managing, or doing startups
- Recognize if you want one of those jobs
- Opportunity cost is high
- Ph.D. jobs pay decently, but not fantastically

# What is a Ph.D.? A process

- On average, 4-6 years
- Major steps:
  - Classes (show broad knowledge)
  - Qualifying exam (show area-specific knowledge, some capability to do research)
  - Thesis proposal (show plausible thesis plan)
  - Thesis defense (show expertise and contribution)



# What the Ph.D. is not

- A chance to take more classes
- Something to do in the meantime
- Well-defined
  - A radical change if you come from your undergraduate or masters
  - No assignments and “checklists”
  - Your work is not homework; if you only do what your advisor asks, you will have missed the point of the Ph.D.

# How am I evaluated in the Ph.D. program?

- Early on (~1st year)
  - Standing out in classes, deliverables
- Middle (2-3<sup>rd</sup>)
  - Paper production – number and quality (= top conferences)
- Later
  - Independence, initiative, creativity

# How am I evaluated after the Ph.D.?

- Not by your grades, ever
- Not even your dissertation, really
- Mostly, by your cv (papers), job talk, meetings with people, and recommendation letters

# How am I evaluated after ...?

- For an academic job
  - Papers: number and quality → overall productivity and contribution
    - As recognized by your community, so carefully how you select it
  - Impact and standing → overall level of dominance of something
  - Independence, initiative, creativity → ability to do novel work
  - Ability to be persuasive and clear → ability to get grants and teach well
  - Affability and fit with others in dept → ability to collaborate

# How am I evaluated after ...?

- For an industry or government job
  - As above, but less so
  - Practical research with specific applicability
- For Wall Street
  - General intelligence
  - Maybe some applicability to finance
- For management consulting
  - Ability to do case studies
  - General affability and poise

# How am I evaluated after ...?

- Your own startup
  - Be willing to do everything: sales, business plans, programming, etc.
  - Be willing to work intensely, on a budget
- Note that of all these jobs, a Ph.D. program essentially trains you best for an academic job, because it mainly focuses on high-quality research

# Academia or industry?

- Academia (generally):
  - More freedom
  - More people working on your projects
  - More intellectual stimulation
  - More young people
  - More people from other fields around
  - More long-term impact
  - More technique focus
  - More prestige

# Academia or industry?

- Industry (generally)
  - More structured
  - More stability
  - More money
  - More direct/tangible impact
  - More problem focus
  - More holistic problem-solving
  - More focused to-do list
  - More time to do technical work



# The dissertation

- A coherent collection of contributions to a single problem area
  - Every good dissertation has a thesis
- This step should be relatively easy after the proposal (except for perhaps the writing)
- It may only include a small fraction of the publications from your graduate career
- Last “step”, but not the critical one. Remember: few people will read your dissertation

# The job hunt

- Actually, this can (and should) begin very early in your graduate career
- Never too early to start networking, self-promotion, etc.
- The big “push” will come once you have established your area of expertise/main contribution
- Treat everyone you meet with respect – you never know who will be your key to your dream job

# Passion and Interest

- Q: “Am I smart enough to get a Ph.D.?”
  - Wrong question; are you *passionate* enough?
- If you are sitting here, you have the intellectual horsepower
- If you are passionate about a problem, with enough tenacity, you can make a meaningful contribution

# So...do you really want a Ph.D.?

- Consider
  - What type of career do you want?
  - Do you have what it takes (personality, drive, passion) to succeed?
  - Is this the best use of your time?
- If not, it's OK to leave
  - Now, or at any time (recall the “sunk cost fallacy”)
- If so, optimize your decisions (life, career, research choices) to make the most of it
  - and give it everything you have!
  - If you're going to “half ass” it, why bother?