Grad school, applications to academic positions, how to be successful in academia.

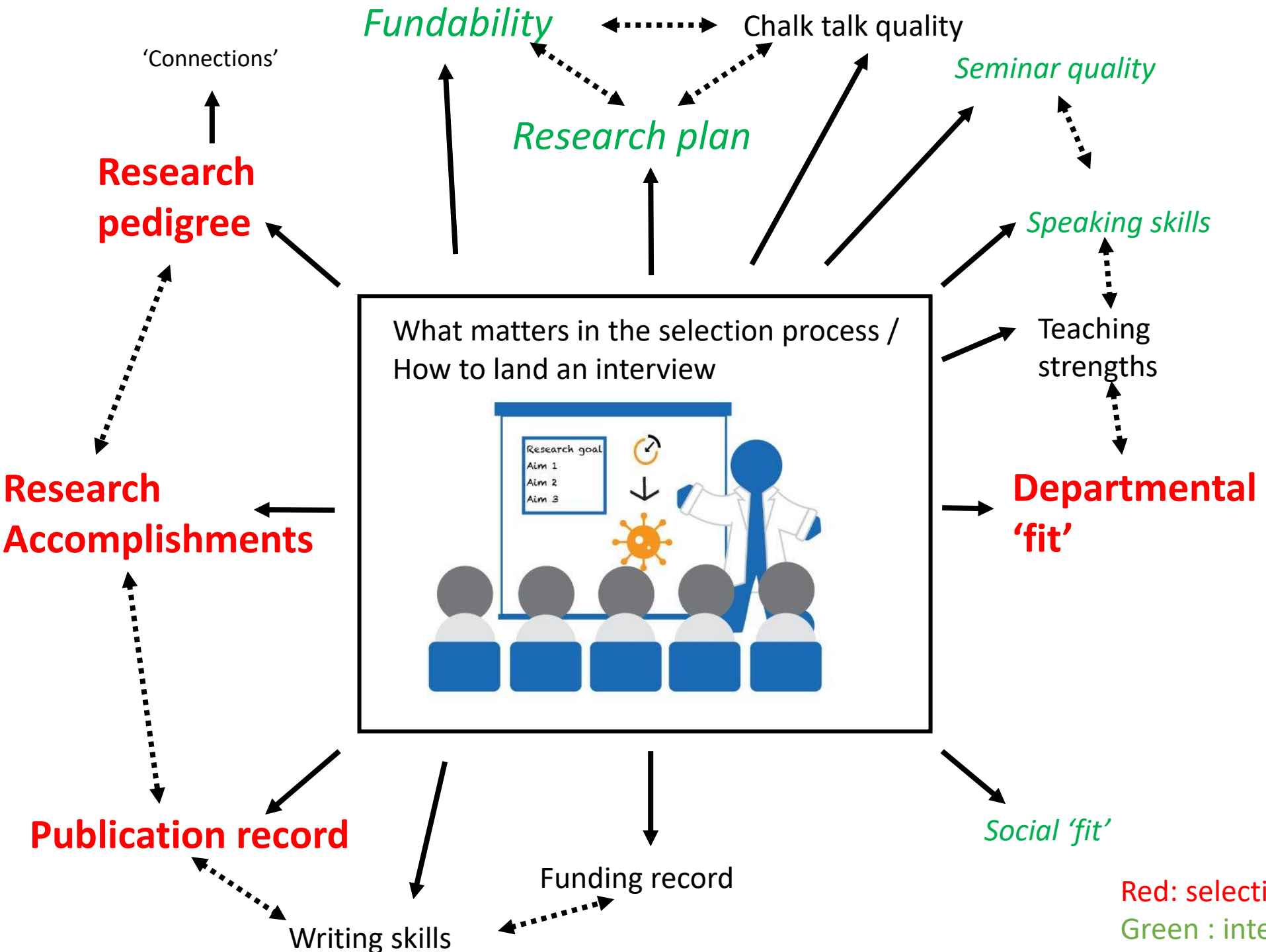
- Sources:

How to Be a Successful PhD Student (in Computer Science (in NLP/ML))
Mark Dredze (Johns Hopkins University)
Hanna M. Wallach (University of Massachusetts Amherst)
http://people.cs.umass.edu/~Wallach/how_to_be_a_successful_phd_student.pdf

The Nature of the Beast
Field guide to computer scientists
http://www.cs.utexas.edu/~mooney/cs178H/slides/professors.ppt

The 10-year process of obtaining a faculty position
https://www.cmu.edu/bio/teaching-club/resources/applying_to_faculty_postions.ppt

Advice to Young Faculty Members
Mark Wistey, Jan 2016


Fundability
Chalk talk quality
'Connections'
Seminar quality
Research plan
Research pedigree
Speaking skills
What matters in the selection process / How to land an interview
Teaching strengths
Research goal
Aim 1
Aim 2
Aim 3
Research Accomplishments
Departmental 'fit'
Publication record
Social 'fit'
Funding record
Writing skills
Red: selection process
Green : interview process

PREDICTORS OF FUNDING IN ACADEMIC FIELDS

Yoram Neumann, *Boston University, Massachusetts*

This study assesses the relative salience of various predictors of funding in different academic fields. Predictors of funding include the various dimensions of past research performance: articles, articles in leading journals and books. Articles predict quite accurately funding decisions in chemistry ($r = 0.58$; $p < .001$). Books, on the other hand, are not the dominant predictor of funding in either the social or physical sciences. The implications of these findings for higher education are discussed and elaborated.

PREDICTING FACULTY SUCCESS IN UNIVERSITY GRADUATE DEPARTMENTS

Yoram Neumann, *Associate Director, Center for Applied Social Science and Assistant Professor of Sociology, Boston University*

This study tests a model of predicting faculty success in the different fields of chemistry, physics, sociology, and political science. The main hypotheses tested and confirmed are:

(a) In a field with a low technological development, professional age is more important in predicting faculty success than in a field with a high technological development.

(b) In a field with a high technological development, articles are more important in predicting faculty success than in a field with a low technological development.

(c) In a field with a low technological development, books are more important in predicting faculty success than in a field with a high technological development.

These hypotheses are tested separately for the tenured and the nontenured faculty groups. The policy implications of this model in regard to the management of graduate departments have been discussed and explored.

Predicting early career research productivity: the case of management faculty

IAN O. WILLIAMSON[1]* AND DANIEL M. CABLE[2]

[1]*University of Maryland, Robert H. Smith School of Business, College Park, MD 20742-1815, U.S.A.*
[2]*University of North Carolina at Chapel Hill, The Kenan-Flagler Business School, Chapel Hill, NC 27599-3490, U.S.A.*

Summary We used a longitudinal design to examine the predictors of early career research productivity for 152 management professors over the first six years of their career. Results revealed early career research productivity to be a function of dissertation advisor research productivity, pre-appointment research productivity, and the research output of a faculty member's academic origin and academic placement. However, the effects of these predictors varied over time in terms of strength. The findings are discussed in terms of guiding the evaluation and hiring of new researchers in knowledge-based industries. Copyright © 2003 John Wiley & Sons, Ltd.

However… your eventual success as a faculty (in terms of funding, publication output, and eventually tenure decision) will be determined by a sole factor : your past research performance (that is your publication record)….

Publishing is the MOST important thing one can do, as a student, and as a faculty!!!

Early career research productivity, given by publications and presentations, is strongly correlated with pre-appointment productivity. That is a strong record of publishing as a student and as a postdoc.

Pre-appointment productivity is strongly correlated (journal and conference papers) with dissertation advisor productivity, that is having a culture of publishing papers in your advisor's research group. It is also (more weakly) correlated with academic origin scholarly output, that is having a culture of publishing among your fellow students / researchers. As well as with to the scholarly output of your academic placement institution, that is whether in the department you join as a faculty there is a culture of publishing among fellow faculty.

Notice: academic origin reputation is not correlated with either pre-appointment or post appointment productivity. However it is the key factor that correlated with academic placement reputation.

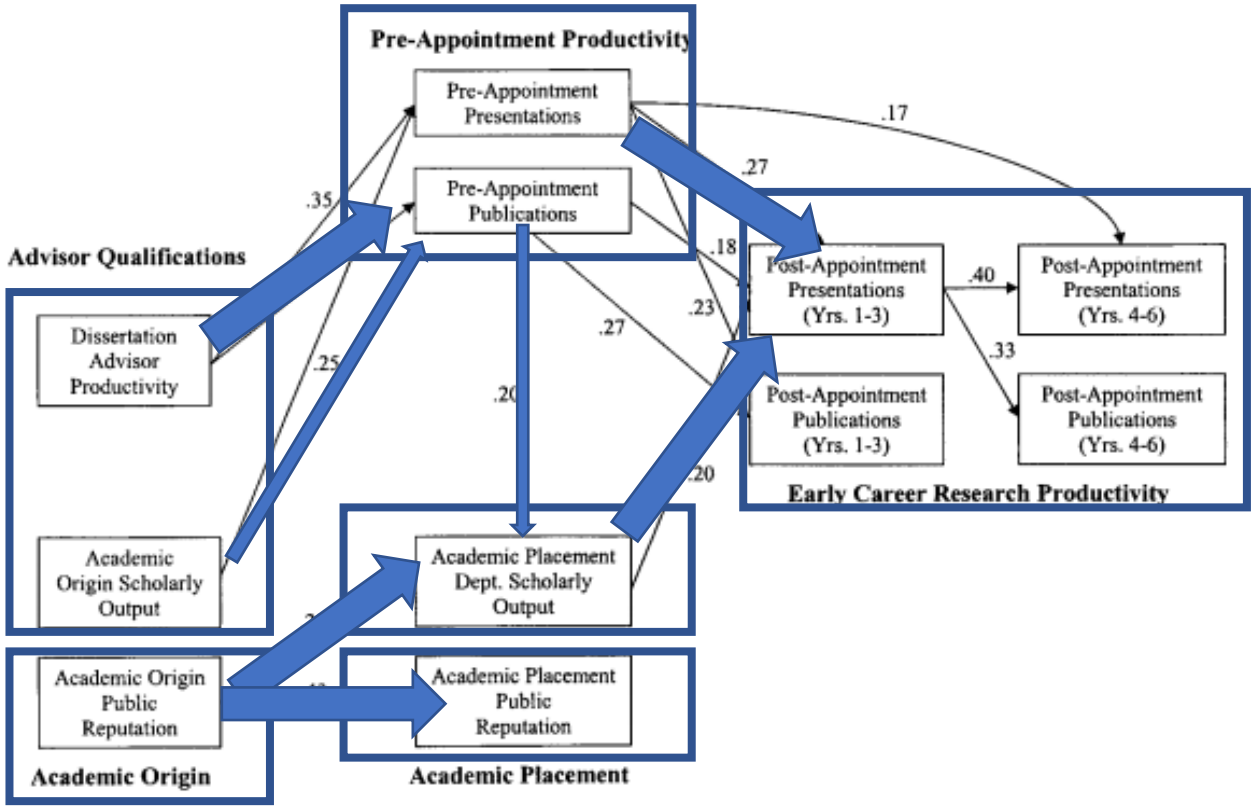


Figure 2. Significant path coefficients of hypothesized model

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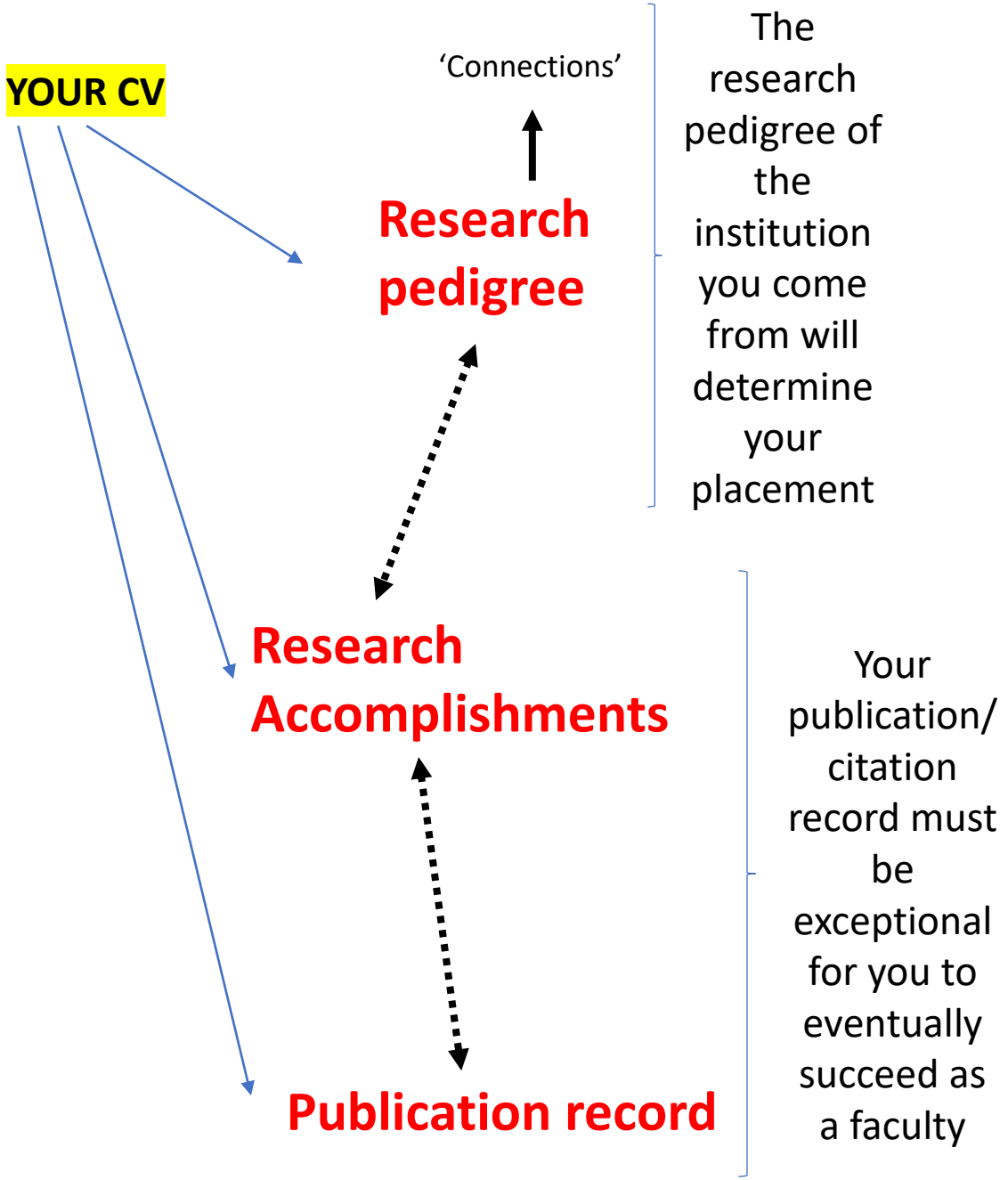


The research pedigree of the institution you come from will determine your placement

Your publication/ citation record must be exceptional for you to eventually succeed as a faculty

YOUR CV

‘Connections’

Research pedigree

The research pedigree of the institution you come from will determine your placement

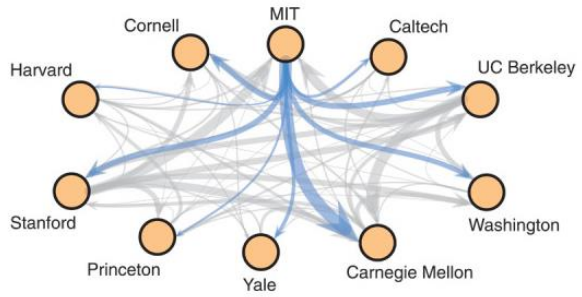
RESEARCH ARTICLE | NETWORK SCIENCES

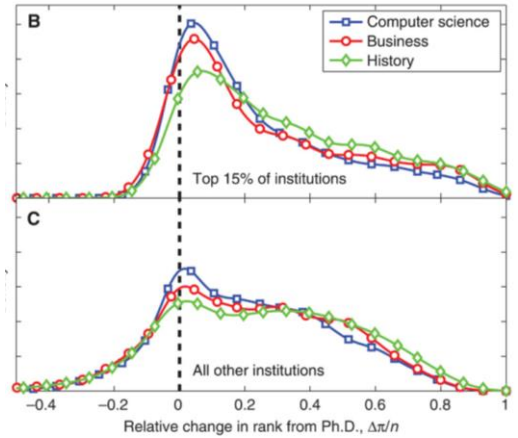
Systematic inequality and hierarchy in faculty hiring networks

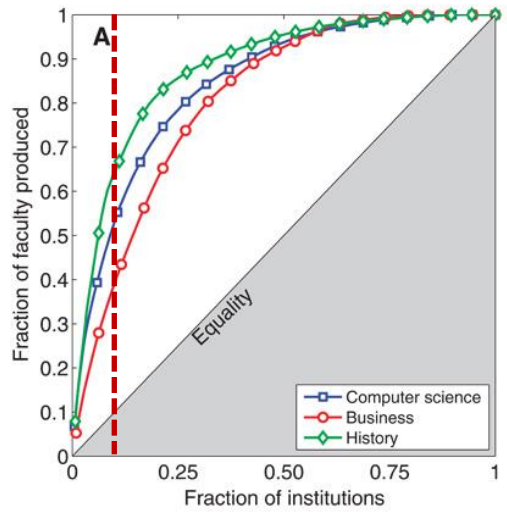
Aaron Clauset[1,2,3,*], Samuel Arbesman[4] and Daniel B. Larremore[5,6]
+ See all authors and affiliations

Science Advances 12 Feb 2015:
Vol. 1, no. 1, e1400005
DOI: 10.1126/sciadv.1400005

…doctoral prestige alone better predicts ultimate placement than a *U.S. News & World Report* rank, women generally place worse than men, and increased institutional prestige leads to increased faculty production, better faculty placement, and a more influential position within the discipline.







Across nation : most faculty across all universities tend to have gotten their PhD’s from the top 10 schools.

Transitions are horizontal : you are likely to get a faculty position on an institution of similar rank to that of your PhD granting institution…

Research pedigree

Coming directly from a PhD from the U, you might be able, with an exceptional publication record, to do an “horizontal transition” and get a faculty position in an institution of similar rank and similar prestige as the UofU: consider this when applying to faculty positions.

Try to network with people from those institutions, e.g. while at conferences.

Example institutions: University of New Mexico, Colorado State University, University of Arizona, Washington State University, UC Davis, Oregon State University,…

I strongly suggest, after graduating, doing a postdoc at a top institution (e.g. any of those listed in the right figure) so to enhance the “prestige” in your CV!

RESEARCH ARTICLE | NETWORK SCIENCES

Systematic inequality and hierarchy in faculty hiring networks

Aaron Clauset[1,2,3,*], Samuel Arbesman[4] and Daniel B. Larremore[5,6]
+ See all authors and affiliations

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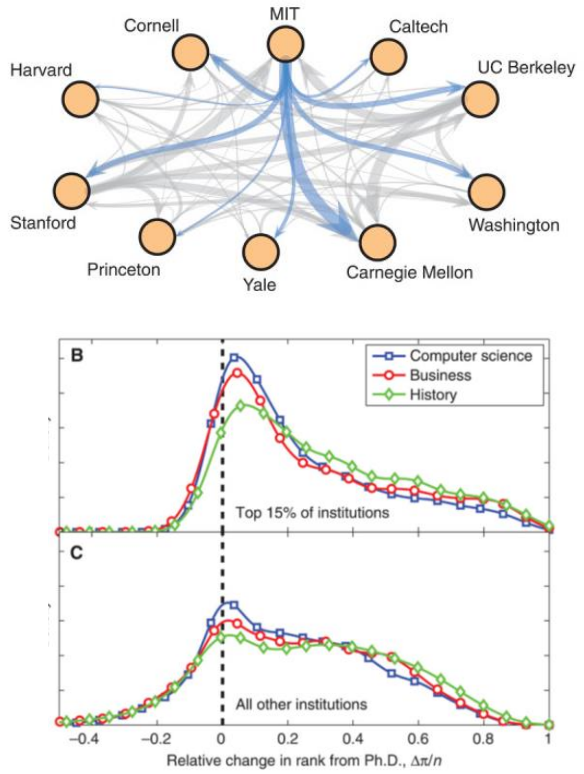

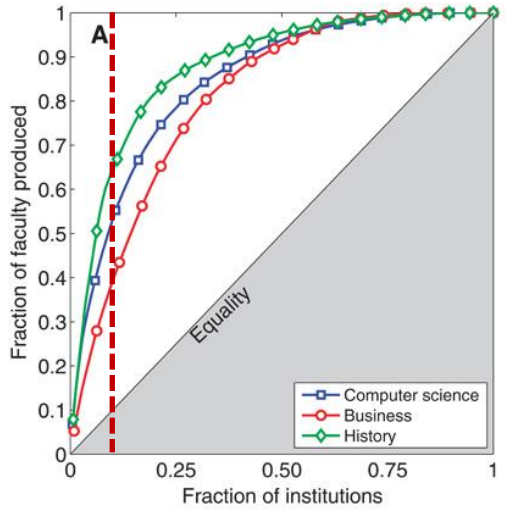

What to do to prepare yourself for a faculty position?

Graduate School- where it all starts

- **a good 'story'**
- apply for fellowships
- **try to finish in 6 years**
- **publish your work (don't worry if it isn't a nature paper)**
- **attend meetings/join scientific societies**
  - present your work (poster/oral presentation)
  - 'SCHMOOZE!'
  - check out potential post-doc opportunities
  - introduce yourself to and ask potential PIs to come see your poster (and ask them for experimental advice)
- **stay in touch with and keep on good terms with your grad. school PI** (they will be writing letters of ref. for you for years to come)
- when looking for a post-doc don't be afraid to change fields

- aim high for your post-doc
  - keep in mind the future (your interest and funding)
  - go to the post-doc factories

What to do to prepare yourself for a faculty position?

The Post-doc (where it *really* starts)

- when choosing a post-doc think big...think fundability....and think about spending a significant part of your future studying this problem
- apply for fellowships
- try to finish in <3 years
- publish your work (think big - Nature/Science/Cell and think *many*)
- attend meetings/join scientific societies
  - present your work (poster/oral presentation)
  - 'SCHMOOZE!'
  - use your connections to ask PIs if they are hiring in the coming year
- try to do some type of service i.e. review papers, write portions of the PIs grant help out other PIs labs.
- set-up potential collaborations
- get yourself 'known' in your field
- stay in touch with and keep on good terms with your post-doc PI (they will be writing letters of ref. for you for years to come)

- WORK HARD! PUBLISH! PUBLISH! PUBLISH!

The Job Application

- where to apply?
  - remember those connections?
  - apply everywhere
  - apply to depts. where you think you will have a good research fit
  - 2 types of ads broad = best athlete narrow = dept. has specific need

- when to apply
  - ads start appearing in late summer (august/sept) and continue through november
  - most interviews start in january and run through march
  - most due dates are between Sept 30 and Dec 1 (due dates are often 'soft' but why risk being late?)

- how to apply
  - read the ad carefully some are electronic pdfs, some want paper apps.

  1) Cover letter
  2) CV
  3) Research accomlishments
  4) Research plan
  5) Reprints
  6) Teaching statement
  7) Letters of reference

The Application

Many places receive > 200 how do you get yours to stand out?

- if ad is specific - tailor your cover letter to fit the ad.
- if ad is broad - highlight your accomplishments

1) The cover letter
   - personalize it (Dear Professor Smith) no 'To whom it may concern'
   - 1 full page max
     - introductory paragraph who/where you are,
       why you are writing
     - research accomplishments paragraph
     - research plan paragraph
     - why that specific university would be a good fit for you
       (mention names!)

The Application (cont'd)

2) The CV
   - important biographical stuff
   - education/employment and training
   - honors/awards
   - publications
   - service (i.e. review committees, publication reviews)
   - presentations (invited speaking engagements/conferences
   - publications
   - reference list w/ contact info

****this is the most important part of the app****

3) Research accomplishments
   - 1-2 pages
   - highlight important results and their implications
   - try to emphasize post-doc research

The Application (cont'd)

4) The Research Plan
   - 3-5 pages
   - brief background
   - importance to your field of study
   - what you will do in your first couple of years
   - detailed experiments (*not too detailed*)
   - use figures and include references
   - clear and concise!

****this is the second most important part of the app****

5) Reprints

6) Teaching statement
   - 1-2 pages
   - What you would be comfortable teaching
   - What you would like your students learn
   - How you would make the class interesting and maybe different?
   - What you will emphasize in the class

The Application (cont'd)

7) Letters of reference usually 3-5
   - Post-doc advisor
   - Grad school advisor
   - Collaborators
   - Neighboring PIs (to your post-doc lab)
   - Thesis committee members
   - Colleagues in your field that know you and your research well

stay on good terms with your PIs and colleagues!!!

The Interview

You should hear between late December and late February

- Rejections come early
- Keep a good attitude about them (if you have a decent app, most early rejection are because of poor fit to the ad or dept.)

Prepare for it!

check out dept. web pages, especially for those faculty on your meeting schedule

practice your talk, then practice it again (and again, and the last time ask colleagues to listen to it - bring them beer)

prepare your chalk talk (more on that later0

rest-up it is exhausting - and usually flu season

The Interview (cont'd)

The interview process

What they will get from the interview:

- Are your accomplishments above threshold
- Is your research plan a good fit with dept. strengths and weaknesses?
- Are you a good communicator
- Will the faculty want to interact/collaborate with you

And how they will get it:

- 1 on 1 interviews
- formal seminar
- 'chalk talk'
- a very nice dinner with 3 faculty

Remember: YOU ARE BEING (politely) CHECKED OUT! Don't expect tours of the building/campus/city.

The Interview (cont'd)

1) 1 on 1 interviews

with the department chair

usually about specifics of the dept.

ask about teaching req's, the grad student costs

with faculty on the search committee

be chatty, but don't interrupt them - they lead the discussion

let them talk about their research

ask lots of questions about everything (which ever way the discussion is going)

2) the formal seminar

- 50 min no longer!!!!!
- be dynamic and engaging
- show your excitement
- feel free to use a chalkboard if needed
- field all questions with humility and be down to earth
- humor helps sometimes even a self effacing joke
- graciously thank the dept. for the invitation

The Interview (cont'd)

3) The dinner (a chance to relax, but not really)

- stay 'on'
- be social
- ok to mix up science chat with details about the university/city
- manners!

The Interview (cont'd)

4) The chalk talk

Basically your research plan

brief background
what is the importance of your research?
what's the first experiment you will do?
what will you write about for your first grant?
talk about the details

the faculty can be very critical here, defend yourself with tact, but don't be arrogant. also, they may make suggestions and offer advice. if they're off, politely point out the flaw.

i have never seen a candidate go through all of their slides

i came with about 10 slides - showed 7. it lasted 1 hr 45 min

feels like a prelim proposal

The offer (after the waiting game)

After an agonizing wait, a phone call from the search committee chair or dept. chair is made to you by mid-march through mid-may

The will ask for a wish list

give them everything you will want to get your lab started
can be painful - ask friends or new faculty for theirs
detailed prices

Negotiations

salary, student support, lab space, start-up funds

everything is fair game (housing allowances)

The 2nd visit

view lab space
see the rest of the building/university/city

What is Tenure?

- A system with a long probationary period
- Two outcomes:
  - Tenure: A job for life
  - No tenure: Good luck! Have a good life
- The tenure decision:

  evaluation of teaching, **research**, and service

Life of a Tenure-Track Professor

- Teaching
  - Teach (and design) organized classes
  - Advise students (very time-consuming)
- Research
  - Do research (usually with graduate students)
  - Write papers
  - Attend scientific meetings
- **Obtain grants to fund more research** (10% hit rate at NSF)

Success Factors (at a research university)

1. **RESEARCH**
2. **RESEARCH**
3. **RESEARCH**
4. Teaching
5. Service

Advice to Young Faculty Members

Mark Wistey, Jan 2016 (last revised Apr 2017)

I've often told my students that a negative result is still a good result—and publishable—as long as you figure out *why* it worked out that way. Publishing the failure helps others advance who otherwise would fallen into the same potholes. So here are some of my thoughts about tenure.

First thing: Funding is your top priority, period. Notre Dame's aspirational peers count the dollars you bring in, and that's about all. Publications are based on funding. Students you graduate are based on publications and funding. Nothing you do counts as much as funding. I expected my chief contact at AFOSR—who was excited about my primary project—to have funding as soon as the war was over. Guess what? We're still at war, and he still has no money to give externally. Talk to *multiple* DoD program managers *repeatedly*, pepper them with (well written) white papers, revise, repeat. The funding environment is not what it was 10 years ago, much less 20, so you need to be diverse and capture unexpected funding areas (NIH? DHS?).

Second thing: Don't swing exclusively for the home run. Go for sure bets for your first few years, even trivial or menial work. Get easy papers; go over well-plowed ground. Go for home run projects later, when you've already got papers and a big group and lots of funding. I put all my eggs in one basket[1] at first, and when that project ran into problems, I was 3 years behind my competition, with a gaping hole in my publication record. When my alternative project likewise failed to produce a working device, it was too late. Note: I was given this same advice at the very beginning, to get small early projects rather than wait for one big outcome. But I thought I was smarter than that; I was "trying to stay focused[2]" by not getting sidetracked on small projects. In hindsight, I should have harvested the simple, small papers that would have come from them. (Grace Xing told me when I started that I could look forward to the day when I finally was proud of a paper, and that it took her about 3-4 years. In hindsight, I wish that I had recognized what's now obvious; her comment meant that for her first 3-4 years, she was publishing papers that she was embarrassed about. And Grace is a good researcher! I didn't submit any papers I was embarrassed about, and I should have been doing so all along the way—not wrong papers, just lots of okay or adequate papers.)

Of course, you won't get strong recommendation letters for tenure if you don't have some big papers. But better to have many early, small papers now than one big paper at the end.

You have probably heard that new papers you publish based on your postdoc or graduate work don't count toward tenure. That is correct. They don't. Literally.

With that being said, those papers can count in one critical area: they show funding agencies that you're productive in your new job. I had several proposals come back with feedback that I hadn't proven I had a working lab yet. If you get some new publications out, you can at least fake it while you're getting your lab running and students trained. They don't need to be good papers. Get them published in any journal, and don't waste any more time on them. Think LPU's. If you have good stuff left over from grad school or your postdoc, you might even consider asking your former advisor if--as a favor--you can publish it without their name so it counts toward tenure.

Tell your students every week: Every task you do and every experiment you perform should be directed to a specific figure for the paper that it's going into.

Get out of the lab. I'm probably one of the top 10 or 20 best qualified people in the country to set up a custom MBE system, and I chose to set up two of them, partly to help coworkers in collaborations. In retrospect, I should have bought just one and not done the work to customize it, or else picked a different research project. You don't have time to be in the lab except to get your students trained. Plan your research and projects in such a way that you could succeed even if you were locked out of the lab. Similarly, if you have an equipment-heavy research focus like MBE, people judging your work (both funding and tenure) likely will not understand that. I was on multiple NSF panels where that was true.

Beware intra-university competition for the same funds. I didn't find out until my 6th year that some NSF program managers won't fund 2 programs from the same university department, with a few exceptions. That means I was wasting my time trying to compete against a couple of heavy hitters who were here. Of course, my own early proposals had other problems and may not have been funded anyway. But even if they'd gotten highest rankings, they still probably wouldn't have gotten funded due to the partitioning of grants. Talk to the program manager ahead of time and ask them straight up if they have any hesitation about funding multiple grants to the same department.

Google "Ira Glass on Storytelling": https://vimeo.com/24715531 Watch it and make your students watch it. I wish I'd seen it! It's crucial to silence your inner critic and start doing shoddy work—*especially* if you know it's shoddy. That is the only way you start doing great work.

Regardless of what you may be told, teaching is not going to get you tenure. It's unlikely to help, except maybe as a tiebreaker. If you're getting teaching evaluations above 50%, you've already reached diminishing returns. Short your classes—and this is coming from someone who loves teaching and received several teaching and outreach awards. Simply consider Notre Dame's aspirational peers: Who gets tenure? You know the answer, because you likely had them for class yourself. Tenure evaluation priorities are objectively quantifiable (to first order):

$$\frac{\text{\# strong researchers denied tenure due to bad teaching}}{\text{\# strong teachers denied tenure due to bad funding}} = \frac{\text{Hours to spend on class}}{\text{Hours to spend on research}}$$

Teach well if it makes you happy (as it does for me), or because your own students need to learn your material. Just recognize that it might serve 5% of your tenure case.

For publications, be prepared to write every paper for your students, especially until you have elder students to start taking revision duties. Have them give you figures and a draft, then you rewrite it from scratch. As a grad student, I considered this rude when advisors did it. But then again, as a grad student, I didn't know how to write a great paper, even though I thought I did.

Some things that worked well for me: Find good mentorship from highly successful faculty. If they're too busy, find older faculty, who are often keen to share their hard-earned wisdom. Make close friends at other schools so you have an outside perspective and someone to complain to when things go wrong. Also remember that the colleagues you work closely with aren't the ones you need to worry about leaving the wrong impression with. It's those you rarely see—perhaps in other departments—who may latch onto an offhand complaint and think it's permanent. Remember to always be doing "Great!" and smile broadly.

In conclusion, these are collected thoughts from someone who didn't make it. I'm hoping the wisdom to cynicism ratio is much larger than 1, but then again, I was beneficiary to some correct cynical advice from mentors about teaching. I also wanted to capture my thoughts before that ratio changes, or before memory tries to reduce the number of "causes." Just as in an experiment, failures are often more complicated than we'd care to admit, but are still solvable problems. I do sincerely hope that my experiment can spare you treading the same mire I've walked.