Adding Coaching to Mentoring to Foster Development of Research Talents

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Mitigating the Very Real Challenges of Being 'Different' as a Young Scientist: A Key Role for Coaching to Complement Mentoring

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Our focus – faculty diversity – *Why* is it so low? What might we do about it?

Empirical research studying career decisions – starting during PhD training

Proposing and testing theory-derived solutions – many through ‘interventions’

Moving from young scientists being acted upon to them doing the acting – agency – not objects in a pipeline!

Integrating social and natural sciences

Moving from expecting mentors to do it all to addition of highly skilled coaches and group processes to help mitigate complex sociocultural dynamics most mentors are not in a position to address
Diversity among scientists and faculty as ‘survival analysis’

An individual starts out either in college or the start of the PhD with some probability of a successful scientific and/or academic career

Over time, the probability goes up and down

Can count bodies along the way but does not reveal why
Diversity among scientists and faculty as ‘survival analysis’

An individual starts out either in college or the start of the PhD with some probability of a successful scientific and/or academic career.

Over time, the probability goes up and down.

Can count bodies along the way but does not reveal why.

What are the factors/events/experiences/choices that contribute to increases and decreases in probability of persistence toward academic careers?

What is known about social and psychological processes/theories behind how ‘survival’ happens or not?

What do they reveal about differences by gender, race, ethnicity, class, ‘being different’?
Social science theories and models reveal much about growth, evolution and success

Identity formation, remodeling, competition/contingencies
- What we do, who we are, what we want to become – critical in decision to pursue the PhD and future careers

Cultural Capital – Social Reproduction
- The ‘stuff’ we learn unconsciously based on the circumstances we grow up in
- Big impact on how others perceive us and how we know how to act

Social Cognitive Career Theory (SCCT)
- Integrates several elements that converge into career decisions
- Identity is one critical component
- Self-Efficacy – perceptions of ability narrowly focused within a field
- Outcome Expectations – What will it be like if I end up as….? How do I know what it will be like, how does it ‘fit’, how would I get there?
The Academy for Future Science Faculty: Coaching to Complement Mentoring

Can we change the “survival curve”?
### What do we mean by coaching?

<table>
<thead>
<tr>
<th>Elements/Limitations of Traditional Research Mentoring</th>
<th>Academic Career Coaching as a Supplement</th>
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<tbody>
<tr>
<td>Experience, training, skills and experience vary widely between different mentors; quality of mentoring is variable</td>
<td>Experienced and highly skilled mentors are recruited, and given additional systematic and theory-based training.</td>
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<tr>
<td>Common conflicting interest (e.g. between research and students’ career interests, and between deciding who to promote or mentor how within their lab)</td>
<td>Act as independent advisors and do not have a conflict of interest (coaches come from different institutions from their students and are bound by confidentiality agreements)</td>
</tr>
<tr>
<td>Face growing demands on their time, which means they have time constraints on their mentoring</td>
<td>Students get dedicated time and space for discussions, especially around navigating graduate school and future scientific careers</td>
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<td>Can lack an informed understanding and a space to talk about the impacts of “being different”, and the role that assumptions about race and gender can play in science</td>
<td>With training in diversity Coaches provide students, particularly UR and female students, with a “safe space” to discuss sensitive issues of “being different” in graduate school and careers.</td>
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<tr>
<td>Often gives minimal guidance to expect and promote independence through figuring it out on your own</td>
<td>Guidance is active and purposeful, expertise transferred, strong teaching element, can be individual or group-based</td>
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The Academy Design

Complement research mentors with highly skilled coaches – drawn from skilled mentors, leaders of research training, given additional training

**Theory Underpinnings:** Identity formation, cultural capital, SCCT and Communities of Practice – *teach to students and coaches to make invisible visible* and design with theories in mind

**Approach:** Annual in-person meetings of students and Coaches + virtual coaching (group and individual) – conducted as Randomized Controlled Trial – full group activities/coaching and coaching groups

**Demographics:** Equal numbers of students by gender and race/ethnicity

**Data:** Mixed methods with vast array of qualitative interviews and recording of meetings
Current Status

Academy I
- 100 (87 now) beginning PhD students + 10 Coaches
- began summer, 2011 – also met in 2012 and 2013, some 2014
- now finishing fourth PhD year

Academy II
- 60 (58 now) advanced PhD students + 6 Coaches
- began summer, 2012 – also met 2013, some 2014
- Have finished PhD – moved on to postdoc etc.

Some coaching groups also meet virtually and in-person

Studying progression of students compared to controls, impacts of academy on general progression and toward academic careers

Studying Coaches, how they and their groups vary, and delivery of coaching to group and individuals
Academy I URM Students are less likely to leave the PhD than Control

Through 3 years of the PhD:

URM:
- Control: 5/23 = 21.7%
- Academy: 3/52 = 5.8% - Significantly Reduced Relative Risk Ratio of 26%

NON-URM
- Control: 4/59 = 6.8%
- Academy: 5/44 = 13.6% - differences not significant
Is the Academy impacting “interest” in and progression toward academic careers?

“Interest” can be asked but hard to know how to interpret

Have been asking students to rate ‘commitment’ to academic career but also hard to know what to make of it

2 years ago began to dissect interest:

‘Interest’ includes **achievability** & **desirability**

“On a scale of 1-10, how achievable (or desirable) does an academic career seem to you?”

Repeated Measures ANOVA – **Academy II**
## Academy II vs. Control

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<th>Pre-Academy</th>
<th>1 year later</th>
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<tbody>
<tr>
<td><strong>Achievability</strong></td>
<td></td>
<td></td>
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<tr>
<td>Academy*</td>
<td>5.75 (2.30)</td>
<td>6.39 (2.23)</td>
</tr>
<tr>
<td>Control</td>
<td>6.58 (2.34)</td>
<td>5.81 (2.86)</td>
</tr>
<tr>
<td><strong>Desirability</strong></td>
<td></td>
<td></td>
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<tr>
<td>Academy*</td>
<td>7.00 (1.72)</td>
<td>6.36 (2.42)</td>
</tr>
<tr>
<td>Control</td>
<td>7.83 (2.04)</td>
<td>5.97 (2.49)</td>
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* Different at p>0.05
Are the patterns different by gender or race/ethnicity?

Not really – changes over time and differences between Academy and Control are very similar for men and women, URM vs. non-URM

Not surprising – what is being taught and provided is of potential value to any young scientist

Qualitative evidence that greatest perceived value is for low cultural capital students

Some high achieving, non-URM students at elite institutions minimally engaged or drop out of Academy I
Race/ethnicity Differences Perceived Value of Academy II

Mean rank

- Choosing Postdoc
- Using IDP
- Achieving career goal
- Managing mentoring

URM
Non-URM
Gender Differences in Perceived Value of Academy II

- Acad career achievability
- Choosing Postdoc
- Grantwriting confidence

Mean rank

- Female
- Male
How do students see the value of Academy II?

Please rate how useful has been what you learned from: (scale of 1-10, 1 being not useful, 10 being very useful)

a. Your time at the 2012 Summer Academy
b. Your Coach
c. Your coaching group conference calls
d. Other Academy participants

“Academy Usefulness Score” = the average of these four ratings

URM students = 7.64 +/- 1.35
Non-URM students = 6.94 +/- 1.17 (p=0.043)

Of those that found the Academy particularly useful (cut off ≥8), 80% (16/20) were URMs, and 55% (11/20) were female URMs
What is going on in a Coaching Group?

Qualitative analysis

- Qualitative case study – first step to comparative analysis
- Interviews, ethnographic non-participant observational field-notes, and audio recordings (and through cyber-ethnography of email and social media exchanges)

- Analyzed and coded via the qualitative analysis software NVivo using a coding architecture developed initially using a grounded theory approach (‘universal codes’)
- Data collected between May, 2012 and August, 2013
  - Sub-codes: coaching dynamics/mechanics; diversity; achievability and desirability of an academic career
- Now expanding to look across coaches and groups
Themes that emerged

1. The coach as an independent advisor
   “I have really enjoyed the benefit of having somebody who’s not necessarily affiliated with my institution.” (African-American male)

2. The Academy as a dedicated space for career advice
   “[S]ome of the things that I probably would have needed my PI for, [my Coach] was there.” (African-American female)

3. The coach as a role model for URM students
   “You as my coach are very inspiring because you know you’re a wife, a mother, a woman of color, all these things … that was also very reaffirming.” (African-American female, group discussion)

4. The Academy as a ‘safe-place’ – “counter-space”
   “There’s stuff that I say here that I would never say if I was even at my lab.” (African-American female, group discussion)
Difficult Conversations Theme

5. Having ‘difficult conversations’ about diversity and inequality

“[Y]ou do not need to fit the box. … [W]hat our mentors were taught is that you have to fit the box, because everyone looks like the box, and they were put through the box and suffered through it.” (Coach, group discussion)

“[T]here have been times when he [my mentor] has tried to fit me through the box, because he has been trained by a white, Caucasian male who is the Godfather of our field.” (Asian-American female, group discussion)
Extending Coaching to Key Skills

For 15 years have been developing group coaching model for to teach NIH grant writing to augment mentors

Through ARRA Supplement developed online tools to display ‘rhetorical patterns’ of NIH grants – teachable skill

My ‘day job’ is as a junior faculty Coach to help them get started and seek funding

Work individually but much more powerful in small groups to go over sections in real time

Meet weekly for ~90 minutes for 2-4 months

Visible growth and contributions from members

WAYYYYYY beyond grant writing workshops

Since 2008 - ~250 participants, ~110 grants submitted (K and R), know of at least 54 funded so far
What is happening during writers groups?

Development or refinement of scientific thinking, ability to define research questions, hypotheses,
Scientific writing skills – down to level of sentence construction
Viewing proposal writing as a highly refined stylistic pattern – including rhetorical patterns
Detailed knowledge of what goes into each section and why
Developing ability to ‘think like a reviewer’
Demystification – grant writing is a very learnable skill
Simulation of grant review process and realities
Positive peer group – all in it together
Career development guidance – sometimes harsh reality check
Some realize it is not for them – often a positive outcome!
But can’t salvage weak science!
Coaching Groups can go virtual…

In 2012, agreed to lead as offshoot of AAMC Minority Faculty Career Development Workshops – for K awards to start

Intensive 1 day initial meeting

Continued with weekly/bi-weekly virtual meetings for 3-4 month – start with 10, usually declines by half

Expanded to R awards in 2014 – high rates of submissions but continued on intermittently for 8 months

Experimenting with as 1 of 4 models for NRMN Professional Development Core starting in 3 weeks!
Summary

Coaching can complement mentoring to promote scientific development

Think of URM scientists as rare events – can’t afford to let vagaries of just mentoring determine survival

Individual and group coaching methods show good signs of shifting the survival curve but time will tell

Many variations of coaching can augment classical mentoring

There is no empirical evidence that mentoring as the primary means of developing the talents of young scientists is the best way – we have just always done it that way – let’s get creative!
### Scientific Careers Research and Development Group

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<tr>
<td><strong>Rick McGee, PhD</strong></td>
<td>(orchestra conductor)</td>
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<td><strong>Longitudinal Study</strong></td>
<td><strong>Pathfinder “Academies”</strong></td>
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<td>Robin Remich, MAT, MEd</td>
<td>Bhoomi Thakore, PhD</td>
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<tr>
<td>Christine Wood, PhD</td>
<td>Simon Williams, PhD</td>
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<td>Patricia B. Campbell, PhD</td>
<td>Veronica Womack, PhD</td>
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<td>Jill Keller, PhD</td>
<td>Letitia Onyango</td>
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<tr>
<td>Lynn Gazley, PhD (The Col. of NJ)</td>
<td><em>Michelle Naffziger-Hirsch, PhD (Oakton C.C.)</em></td>
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<td>Adriana Brodyn, MA, MA</td>
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<td>Ian Jones, MA</td>
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<td><strong>Others</strong></td>
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<td><em>Michelle Naffziger-Hirsch, PhD (Oakton C.C.)</em></td>
<td>Toni Gutierrez, PhD – CLIMB</td>
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