

Shifting Gears in Science Careers

a questionable metaphor

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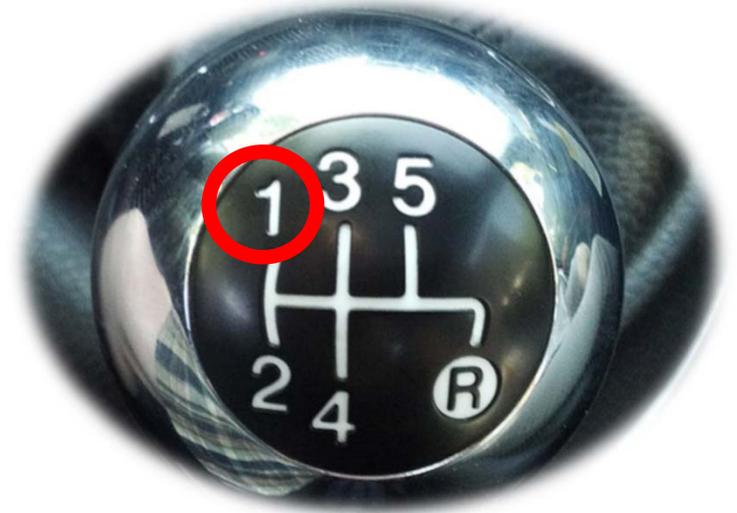


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First Gear: *Learning*

First gear is characterized by learning the basic process of doing science.

- (a) Field techniques*
- (b) Lab techniques*
- (c) Data collection*
- (d) Experimental design*
- (e) Sample processing*
- (f) Data analysis*
- (g) Writing*
- (h) Presentation*



This normally takes place during undergraduate at a university where the student gets involved in research. Sometimes this can be working in the summer, working as a technician or developing an honors thesis.



The shift to second happens once a student had completed all the phases of the research project. This sometimes means professional presentations or submitting an article to a scientific journal. Often this project has many others involved including graduate students and “hands on” assistance by the mentor. Usually during the MS, but some undergrads make the shift.

Second Gear: *Leading*

Second gear is characterized by:

- (a) Being able to LEAD the scientific process. This means completing the project from start to finish as the person fundamentally responsible for the project.*
- (b) Being involved in seating the project within the broader framework of scientific knowledge. This means reading the literature and understanding where your work will advance knowledge.*
- (c) Beginning to develop an approach to mentoring other young scientists.*



This normally takes place, during the Masters Degree.

Note that if someone does not complete a Thesis MS, and instead leaps straight to a PhD, then they have a chance of “stalling.” Skills (momentum) developed during 2nd gear are oft needed to make the needed transition to third.



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The shift to third is often marked by a student leading a project from start to completion and taking on the roll of pushing the project into publication-manuscript submission, addressing reviewer comments, and pushing the paper into print. “I can do a research project.”

Third Gear: *Shepherding*

Third gear is characterized by:

- (a) The scientist changes in capacity from being “overwhelmed” by running an individual project to being able to orchestrate multiple projects at once.*
- (b) The training scientist often has projects in many different phases: design : data collection: data analysis: writing.*
- (c) As time in third gear progresses the training scientist often has papers that are simultaneously: (a) in review, (b) in revision, (c) in press...while still having projects in the development phases.*
- (d) Mentoring of multiple young scientists who help out with various projects. Sharing skills is important and often required.*

This phase stretches through the early and middle years of of the Ph.D up until approximately candidacy.



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The shift from third to fourth can be particularly difficult....lets come back to it after we look at the traits of a fourth gear scientist.

Fourth Gear: *Program manager*

Fourth gear is characterized by:

- (a) Being able to see all of the projects you are shepherding as a cohesive whole.*
- (b) Being able to envision your all of the projects you do as part of a broad scientific pursuit.*
- (c) Thinking forward about your ****program**** how can it be transferred to new ecosystems, or transferred to address new questions?*
- (d) To be cognizant enough of developments in the field to position your ****program**** as angling to address those developments.*
- (e) Beginning to brand your ****program**** and thinking about it from the perspective of an “enterprise” you are orchestrating.*

This normally takes place, near the end of the PhD, into the Post-doc and into your full-time position.



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The shift to fifth gear normally happens during your time in a full-time job as an Assistant Professor or a full-time scientist.

...but let's take a moment and look at the 3rd-4th transition

To review: third – **The Shepherd** : fourth **The Program Manager**

Third to Fourth: *Challenging & Complex*

The shift to from the Shepherd to the Program Manager can be psychically complicated. It involves a transformation of perspective and ego.

Being good a *doing* science projects yourself is a very different challenge than *managing* science projects. Starting to think of your science as a “Franchise” and yourself as the “Face of the Franchise” can be nauseating.

Many students finish the PhD and never make this transition. You do not need to make the transition to graduate. You do not need to make the transition to be happy. Many graduate with a PhD in 3rd gear and never shift to fourth or fifth.

If the job you land does not ask you to write grants- if it is a primarily teaching faculty job, for example- then you never need to worry about this transition. Shepherd your Dissertation through to completion and then “nevermind.”

You only need to shift to 4th, if you are heading down an academic “research” path.



Third to Fourth: *Challenging & Complex*

Difficulty in this transition can lead some students to disengage.

They end up in (research) neutral.

This can be a real problem if the dissertation is not far enough along.

point of strategy- get your PhD research rolling early on!!

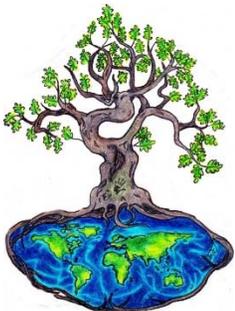
If you end up in neutral and can still finish the dissertation and find a way to a job-job.



Third to Fourth: *Challenging & Complex*

Difficulty in this transition can lead some students to end up in reverse....

A.B.D. the worse letters...



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Fifth Gear: Entrepreneur / General Manager / Ship Captain

*Fifth gear is characterized by being **responsible**:*

- (a) For budgets, especially bringing in the money/resources.*
- (b) For hiring & personnel management. As in a sports team, the GM is responsible for the talent on the field.*
- (c) For reporting and accountability to funding agencies & to the university.*
- (d) For visioning and leadership.*
- (e) For promotion of the lab*

A person would arrive in 5th gear during the Assistant Professor or “full time, permanent, scientist” roll. Often the fifth gear scientist will have multiple, large, research programs running simultaneously. A lot of the work this person does is managing people and budgets. The fifth gear scientist is also responsible for a lot of the high-end work at the end of projects, like managing data sets and prepping manuscripts for publication.



- This can be exhilarating, but if you got into science because you “love snakes” this does not feel like what you signed up for!*
- This person must be willing to own both good and bad things associated with leadership.*

Fifth Gear-Cruise Control?: Sustaining over the long-term

This is a mysterious transition that I am investigating now.

- (a) Being able to maintain scientific productivity on the scale of decades.*
- (b) Being able to create space in your organization for others to succeed.*
- (c) Finding long-term balance in terms of funding, students, productivity.*
- (d) Declining opportunities to strategically prune obligations.*
- (e) Maintaining energy level, avoiding “burn out” and creating space for positive, long-lasting, professional and personal relationships.*



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