

Research Mentor Training

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A full listing of partners and funders can be found at CIMERProject.org.

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Fostering Independence

1. Independent Research and Forced Guidance
2. Identifying Benefits and Challenges of Fostering Independence
3. How Much to Help
4. Strategies to Foster Independence
5. Defining Independence
6. Strategies That Can Be Used
7. Defining Independence
8. Identifying Benefits and Challenges
9. Increasing Reliance
10. Fostering Independence Full Session

Learning Objective:

Mentors will learn to employ various strategies to build their mentees' confidence, establish trust, and foster independence.

Case Study

Independent Research and Forced Guidance

Dr. Klein is very excited about the grant proposal she is writing to NIH. The proposal builds upon research she has been conducting as a K-scholar in the laboratory of Dr. Janco. Dr. Klein feels strongly that the proposal clearly describes the logical next steps in the project as well as relates the research to her previous clinical work. When Dr. Klein meets with Dr. Janco to discuss the grant proposal, she is surprised to discover that Dr. Janco is less than enthusiastic about the proposal. Dr. Janco informs Dr. Klein that the proposal is too closely aligned with Dr. Janco's current work and its future direction. She says that the proposal needs to be reworked, focused on a different, more independent direction of research. Dr. Klein leaves the meeting frustrated, disappointed, and unsure how to proceed.

Guiding Questions for Discussion:

1. What are the main themes raised in this case study?
2. What could have been done to avoid this situation? What should the mentor do now? What should the mentee do?
3. How is independence redefined in a restricted funding climate and an era of collaborative research?

NOTE: This case is taken from the mentee's perspective, providing mentors a slightly different lens.

*From Pfund, et al. Mentor Training for Clinical and Translational Researchers (2012).
New York, NY: W.H. Freeman & Co.*

For additional information, resources and detailed facilitator notes—visit: CIMERProject.org

Mentor Training for **Clinical and Translational Researchers**
Fostering Independence

*From Pfund, et al. Mentor Training for Clinical and Translational Researchers (2012).
New York, NY: W.H. Freeman & Co.*

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Learning Objective:

Mentors will learn to identify the benefits and challenges of fostering independence

Activity

Identifying Benefits and Challenges of Fostering Independence (10 min)

- **ASK:** Please share one benefit or one challenge of a mentee achieving independence. You may want to record the ideas generated in this discussion on a whiteboard or flip chart.
- **NOTE:** Benefits and challenges that may be included are:
 1. **Benefits**
 - Affirmation of your ability to train another researcher
 - Increased capacity in your research field
 - Increased creativity and research in translational research related to your field
 - Authorship on joint publications
 - Increased capacity and skill in your research group
 - Broadening diversity within your research group
 2. **Challenges**
 - Expense
 - Competing demands on time and need to get research done
 - Slower progress toward achieving grant-funded objectives
 - Greater risk of new ideas not panning out
 - Issues of intellectual property
 - Time needed to mentor effectively
 - Misalignment of expectations and goals
 - Addressing the challenges of interdisciplinary work
 - Overlapping research interests
 - Ending the relationship once independence is achieved

Learning Objective:

Mentors will learn to define independence, its core elements, and how those elements change over the course of a mentoring relationship.

Case Study

How Much to Help?

Dr. Richardson is a research scholar who is nearing the end of his post-doctoral fellowship, but wishes to continue his training in his mentor's lab. Thus, he is independently applying for a KL2 award from the NIH. His mentor believes that Dr. Richardson is a very valuable asset to the lab and is highly supportive of Dr. Richardson continuing his training in this lab, but does not have any other funding to support Dr. Richardson's salary. The mentor has agreed to advise Dr. Richardson in the preparation of the application, although noting that it should represent Dr. Richardson's independent work. When Dr. Richardson provides his mentor with a draft of the application, his mentor becomes concerned about the quality of the writing. The research ideas are fairly solid, but the research plan has some minor flaws and the proposal is very poorly written.

Dr. Richardson's mentor believes that the KL2 proposal in its current form would not be a strong candidate for funding. Although the application should reflect Dr. Richardson's work, the mentor has a vested interest in the proposal succeeding so that he can keep one of his most productive researchers. The mentor is unsure how to improve Dr. Richardson's proposal while still retaining it as Dr. Richardson's independent work. Moreover, Dr. Richardson has invested more than a month in preparing this application and is not accustomed to criticism of his writing, so the mentor is concerned that Dr. Richardson's defensiveness may create a further obstacle to improving the proposal.

Guiding Questions for Discussion:

1. What are the main themes raised in this case study?
2. What could have been done to avoid this situation? What should the mentor do now?
3. How would independent research be defined in this case?

Learning Objective:

Mentors will learn to identify the roles mentors play in the overall professional development of their mentees

Activity

Brainstorming Mentor Roles in Professional Development (30 min)

- **ASK (10 min):** In pairs, list all of the roles mentors can or should play in the professional development of their mentee, beyond research training.
- **DISCUSS (15 min):** In a large group, discuss the roles each pair listed. You may want to record the ideas generated in this discussion on a whiteboard or flip chart.
- **NOTE:** Some elements of professional development include:
 1. Networking—social and professional
 2. Finding funding
 3. Managing staff
 4. Time management
 5. Writing
 6. IRB protocol development
 7. Career path guidance
 8. Leadership skills
 9. Work-life balance
 10. Public speaking
 11. Research Ethics
- **DISCUSS (5 min)** in a large group the following questions:
 - Which of the roles on the list are the most important? Why?
 - Are there some roles on the list that should not be the mentor's concern? Why?

Learning Objective:

Mentors will learn to define independence, its core elements, and how those elements change over the course of a mentoring relationship.

Activity

Defining Independence (25 min)

- **ASK:** Please describe your definition of independence. What does “independence” look like across career stages? Include in your discussion what it means at your institution and how that might differ from other places.
- **TELL (15 min):** We recognize that independence looks different at various stages of a researcher’s career. As we list the elements of independence, let’s also note the most appropriate career stage for each element.
- You may want to record the ideas generated in this discussion on a white board or flip chart, writing elements of independence along a continuum based on the discussion. The continuum should stretch from MD or PhD student to clinical fellow, post-doc, new faculty member, and senior faculty member.
- **NOTE:** Some elements of independence include:
 - Advanced knowledge of discipline, including expertise in their sub-area
 - Ability to critically read the literature and find answers to questions through extended literature searches and consulting experts
 - Ability to write a grant proposal for an entire research project
 - Ability to design and give an oral presentation on their work at a national meeting
 - Ability to design experiments for an entire grant proposal and conduct them

Mentor Training for **Clinical and Behavioral Researchers**

Fostering Independence

- DISCUSS (10 min) with the entire group the following questions:
 1. How can you tell if a certain level of independence is achieved? For example, what does independent thinking look like?
 2. Do mentees know what level of independence is achieved? For example, what does independent thinking look like?
 3. Do you think your mentee's estimations of their level of independence are aligned with yours?
 4. How can a mentee work both as an independent researcher and a team clinician?

- FOLLOW-UP ACTIVITY: Draw your own timeline for establishing independence and discuss it with your mentee to see if it aligns with their expectations. You may consider adding this timeline to your compact (if applicable).

Learning Objective:

Mentors will learn to employ various strategies to build mentee confidence, establish trust, and foster independence.

Activity

Strategies That Can Be Used

Have mentors generate a list of strategies that can be used to foster independence. Consider strategies that can be used in face-to-face meetings, over email, through written reports, etc. You may want to record the ideas generated in this discussion on a white board or flip chart.

Learning Objective:

Mentors will learn to define independence, its core elements, and how those elements change over the course of a mentoring relationship

Activity

Defining Independence (15 min)

- **ASK:** Please describe your definition of independence. What does independence look like across career stages? Include in your discussion what conducting ‘independent research’ means at your institution and how it might look different from other places.
- **TELL (15 min):** We recognize that independence looks different at various stages of a researcher’s career. As we list the elements of independence, let us also note the most appropriate career stage for each element.
- You may want to record the ideas generated in this discussion on a white board or flip chart, writing elements of independence along a continuum based on the discussion. The continuum should stretch from MD or PhD student to post-doc, early K-scholar, late K-scholar, and tenured faculty member.
- **NOTE:** Some elements of independence include:
 - Advanced knowledge of discipline, including expertise in their sub-area
 - Understanding how your discipline relates to others and who to seek out for collaboration
 - Ability to critically read the literature and find answers to questions, or uncover new questions, through extended literature searches and consulting experts
 - Ability to write a grant proposal for an entire research project
 - Ability to design and give an oral presentation on their work at a national meeting or to community partners/stakeholders.
 - Ability to formulate a study design for an entire grant proposal, incorporating community stakeholder input
 - Ability to manage relationships with community and academic collaborators and staff appropriately

Part of the W.H. Freeman Entering Mentoring Series, 2014.

For additional resources and complete curriculum—including information on competencies and facilitator notes—visit: CIMERProject.org

Mentor Training for **Community Engaged Researchers**
Fostering Independence

- **DISCUSS** (10 min) with entire group the following questions:
 1. How can you tell if a certain level of independence is achieved? For example, what does independent thinking look like and how does it vary over time?
 2. Do mentees know what level of independence is expected of them? Do they understand that this will change as they progress in their career?
 3. Do you think your mentee's estimations of their level of independence are aligned with yours?
 4. Is there ever a point in the mentoring relationship in which the mentee is so independent that they no longer need the mentor?
 5. How can a mentee work both as an independent researcher and a team scientist?
 6. How are independence and leadership interrelated?
- **FOLLOW-UP ACTIVITY:** Draw your own timeline for establishing independence and discuss it with your mentee to see if it aligns with their expectations. You may consider adding this timeline to your compact (if applicable).

Part of the W.H. Freeman Entering Mentoring Series, 2014.

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Learning Objective:

Mentors will learn to identify the benefits and challenges of fostering independence, including the sometimes conflicting goals of fostering independence and achieving grant-funded research objectives

Activity

Identifying Benefits and Challenges (10 min)

- **ASK:** Please share one benefit or one challenge of a mentee achieving independence. You may want to record the ideas generated in this discussion on a white board or flip chart.
- **NOTE:** Benefits and challenges that may be included are:
 - 1. Benefits**
 - Affirmation of your ability to train another researcher
 - Increased capacity in your research field
 - Increased creativity and research in translational research related to your field
 - Authorship on joint publications
 - Increased capacity and skill in your research group
 - Broadening diversity within your research group
 - Enhanced professional reputation when your mentees are promoted
 - 2. Challenges**
 - Expense
 - Competing demands on time and need to get research done
 - Slower progress toward achieving grant-funded objectives
 - Greater risk of new ideas not panning out
 - Issues of intellectual property
 - Time needed to mentor effectively
 - Misalignment of expectations and goals
 - Addressing the challenges of interdisciplinary work
 - Overlapping research interests
 - Allowing the relationship to evolve to a more collegial one once independence is achieved

Learning Objective:

Mentors will learn to define independence, its core elements, and how those elements change over the course of a mentoring relationship

Activity

Increasing Reliance

Have mentors engage in a follow up conversation to Activity #1, with a more in-depth discussion of team science, and how an increasing reliance on multidisciplinary expertise is transforming how independence is defined. Ask mentors to think through who it is they include in the 'team' and what each contributes. For example, are they counting statisticians, editors, program coordinators, and support staff? How do community partners fit into an academic team, and does that influence how mentors think about independence?

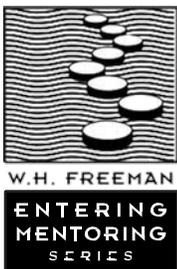


Mentor Training for Social Science Researchers

Fostering Independence

Stephanie A. Robert and Pamela S. Asquith

Adapted from the
W.H. Freeman *Entering Mentoring Series* 2017



Fostering Independence

Introduction

An important goal in any mentoring relationship is helping the mentee become independent; yet defining what an independent mentee knows and can do is often not articulated by the mentor or the mentee. Defining what independence looks like and developing skills to foster independence is important to becoming an effective mentor. Defining independence becomes increasingly complex in the context of team and interdisciplinary science.

Learning Objectives

Mentors will have the knowledge and skills to:

1. Define independence, its core elements, and how those elements change over the course of a mentoring relationship
2. Employ various strategies to build mentee confidence, establish trust, and foster independence
3. Identify the benefits and challenges of fostering independence, including the sometimes conflicting goals of fostering independence and achieving the mentor's own research objectives

Overview of Activities for the Fostering Independence Session: Please note that a core activity is listed for each learning objective. We encourage you to engage the mentors in this activity. There is a list of additional activities that can be used if there is extra time in the session or the core activity is not working well for your group.

	Learning Objectives	Core Activities	Additional Activities
1	Define independence, its core elements, and how those elements change over the course of a mentoring relationship	Mentors share ideas on the core elements of independence and then organize the list based on career stage (Activity #1)	Mentors engage in a followup conversation to Activity #1, with more in-depth discussion about the growing need for multidisciplinary research teams (Activity #3)
2	Employ various strategies to build mentee confidence, establish trust, and foster independence	Mentors share strategies they have used to foster independence (Activity #2)	Mentors read and discuss Case #1: <i>How Much to Help?</i> (Activity #4)
3	Identify the benefits and challenges of fostering independence	Mentors discuss the benefits of an independent mentee, as well as the challenges (Activity #2 continued)	Mentors read and discuss Case #2: <i>The Slow Writer</i> (Activity #5)

Adapted from the W.H. Freeman Entering Mentoring Series, 2017.

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Facilitation Guide

Recommended Session on Fostering Independence (60 minutes)

NOTE: The activities for this session were chosen for use with a more experienced group of mentors. For newer or future mentors, we recommend substituting cases from the additional activities option at the end of this section.

Materials Needed for the Session:

- Table tents and markers
- Chalkboard, whiteboard, or flip chart
- Handouts:
 - Copies of introduction and learning objectives for *Fostering Independence* (page 97)
 - Copies of *Mentoring Research Writers* Reading (pages 102-108)
 - Copies of additional case studies if desired (pages 100-101)
 - Potential resource for handouts: <https://uwaterloo.ca/centre-for-teachingexcellence/teaching-resources/teaching-tips/tips-students/self-directed-learning/selfdirected-learning-four-step-process>

➤ Introduction (10 min)

- ASK: Briefly share one important idea you learned from the last mentor-training session.
- TELL: Provide an overview for the day. Review the introduction and learning objectives for the first session.

NOTE: The time for the introduction was extended for the 3-day agenda. It can be shortened if necessary.

❖ **Objective 1: Define independence, its core elements, and how those elements change over the course of a mentoring relationship (25 min)**

➤ **ACTIVITY #1: Defining Independence**

- **ASK:** Please describe your definition of independence. What does “independence” look like across career stages? Include in your discussion what it means in your department or school and how that might differ from other places.
- **TELL (15 min):** We recognize that independence looks different at various stages of a researcher’s career. As we list the elements of independence, let’s also note the most appropriate career stage for each element.
- You may want to record the ideas generated in this discussion on a white board or flip chart, writing elements of independence along a continuum based on the discussion. Categories should include graduate student, post-doc, new faculty, and senior faculty.
- **NOTE:** Some elements of independence include:
 - ◆ Advanced knowledge of discipline, including expertise in their sub-area
 - ◆ Ability to critically read the literature and find answers to questions through extended literature searches and consulting experts
 - ◆ Ability to write a grant proposal for an entire research project
 - ◆ Ability to design and give an oral presentation on their work at a national meeting
 - ◆ Ability to design and implement a research project from start to finish □

DISCUSS (10 min) with the entire group the following questions:

1. How can you tell if a certain level of independence is achieved? For example, what does independent thinking look like?
 2. Do mentees know what level of independence is expected of them? Do they understand that this will change as they progress in their career?
 3. Do you think your mentees’ estimations of their level of independence are aligned with yours?
 4. How can a mentee work both as an independent researcher and in a team project?
- **FOLLOW-UP ACTIVITY:** Draw your own timeline for establishing independence and discuss it with your mentee to see if it aligns with their expectations. You may consider adding this timeline to your compact (if applicable).

❖ **Objectives 2 and 3: Employ various strategies to build mentee confidence, establish trust, and foster independence and identify the benefits and challenges of fostering independence (25 min)**

- **ACTIVITY #2:** Have mentors generate a list of strategies that can be used to foster independence. Ask mentors to review the list of elements generated in Activity #1 for guidance. Consider strategies that can be used in face-to-face meetings, over email, through written reports, etc. You may want to record the ideas generated in this discussion on a white board or flip chart. If ideas lag, ask them:
1. What do you do to foster independence in mentees who you perceive to be slow writers, good at analyzing data but weaker on creative ideas, lower on self-motivation or time management, great on big ideas but weaker on methodological or statistical skills?
 2. What can your department or school do to help your mentees become independent?
 3. What are some of the challenges of mentees achieving independence? Benefits?
 4. What are some of the challenges and solutions for fostering independence with mentees who have multiple mentors from different fields?

Adapted from the W.H. Freeman Entering Mentoring Series, 2017.

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Additional Activities (if time allows):

Objective 1; Activity #3

Have mentors engage in a follow up conversation to Activity #1, with a more in-depth discussion of the ways in which research team composition is becoming more diverse and how an increasing reliance on multidisciplinary expertise is transforming how independence is defined. Ask mentors to think through whom it is they include in the ‘team’ and what each member contributes. For example, are they counting statisticians, data managers/analysts, editors, program coordinators, and support staff?

Objective 2; Activity #4

Case #1: *How Much to Help?*

Amar is nearing the end of his dissertation, but wishes to continue his research as a postdoc in his mentor’s research group. Thus, he is applying for an individual postdoc fellowship from the National Science Foundation. His mentor believes that Amar is a very valuable asset to the team and is highly supportive of Amar continuing as a postdoc in the group, but does not have funding to support him. The mentor has agreed to advise Amar in the preparation of the application, although noting that it should represent Amar’s independent work.

When Amar provides his mentor with a draft of the application, his mentor becomes concerned. The research ideas are not well defined, and the proposal is very poorly written. Amar’s mentor believes that the proposal in its current form would not be a strong contender for funding. Although the application should reflect Amar’s work, the mentor has a vested interest in the proposal succeeding so that he can retain Amar in his research group. The mentor is unsure how to improve Amar’s proposal while still preserving it as Amar’s independent work. Moreover, Amar has invested more than a month in preparing this application so the mentor is concerned about how to provide feedback that is honest yet constructive to help keep Amar motivated to continue revisions to the proposal.

Guiding Questions for Discussion:

1. What are the main themes raised in this case study?
2. What could have been done to avoid this situation? What should the mentor do now?
3. How would independent research be defined in this case?

Adapted from Pfund C, House S, Asquith P, et al. 2012. MentorTraining for Clinical and Translational Researchers. 1st ed., Entering mentoring series. W. H. Freeman and Co, New York, NY.

Objective 3; Activity #5

Case #2: *The Slow Writer*

A postdoc in my research group is adept at analysis of large data sets, but is a very slow writer. Last fall, I set multiple deadlines that this scholar missed, while another post-doc wrote a grant proposal and submitted two papers. Over the holidays, the slow writer had a breakthrough and produced an outline of a manuscript. To avoid delays in publication, I have now taken the lead in writing the manuscript based on this investigator's work. However, to become an independent investigator, I know this mentee must be able to write independently. Setting deadlines for detailed outlines, manuscript sections, figures, etc. hasn't worked. Trying to communicate the importance of manuscripts to the scientific endeavor hasn't worked either. Neither has encouragement. Veiled threats don't seem professional. Other than being patient, what should I do?

Guiding Questions for Discussion:

1. What are the main themes raised in this case study?
2. How do you convey the level of independence you expect from your mentee?
3. What is the mentor's responsibility in this case?
4. What if the mentee in this case was an international scholar for whom English is not the first language? How do you grapple with issues of independence in writing for international scholars versus others?

Adapted from Pfund C, House S, Asquith P, et al. 2012. MentorTraining for Clinical and Translational Researchers. 1st ed., Entering mentoring series. W. H. Freeman and Co, New York, NY.

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READING

Mentoring Research Writers

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Recognizing the Power of Writing as a Component of the Research Process

As a mentor you have a great opportunity to encourage your trainees to set high goals for their research writing and to help them achieve those goals. You should recognize, in fact, that you have a serious responsibility to motivate and to help researchers-in-training become excellent writers. Why should you and your trainees make writing a priority? The answer is clear to all experienced researchers: researchers earn their living and develop their careers *through the writing they do*—writing proposals to fund research, writing conference abstracts and posters and papers to disseminate new knowledge and to influence future research and the shape of their fields, documenting their research methods and findings, writing reviews of literature, writing reviews of colleagues' manuscripts, and writing letters of recommendation. Writing pervades the research process, and successful researchers spend a significant amount of their time planning, drafting, and revising complex forms of writing. Experienced researchers also know that writing is not just a way to communicate completed findings and polished arguments: writing is actually a powerful form of thinking and learning, one that clarifies thought and makes analyses and arguments more precise.

Acknowledging the Complexity of Research Writing

In order to appreciate the complexity of research writing and to guide new researchers, mentors need to understand that writing is a highly situated practice—that is, it is not a generic, general skill. Successful researchers need to achieve very specific purposes and speak persuasively to particular groups of readers. What is valued in writing and what is conventional and effective in writing varies across particular scientific communities and even within particular communities of researchers.

As researchers transition from writing within particular disciplines or professions to new ones, they often struggle to write successfully, even if they had success in previous writing situations. Given how varied purposes and audiences are for advanced research writing, as a research mentor, you should have intentional conversations about research writing with your mentees—working on and talking about writing are natural and important parts of training programs, and you should not expect new biomedical researchers to be accomplished writers from the start. Becoming an excellent research writer takes time, effort, and dedicated, consistent mentoring.

Mentors should also remember that researchers-in-training, like all students, bring varied literacy backgrounds to each new writing challenge. Some of your research trainees will have done lots of writing and reading, been held to high standards for written communication, and learned to receive and give critical feedback on writing. Others may feel that their intellectual strengths lie in quantitative rather than verbal areas. Some may have great strengths in oral communication rather than academic writing. Others may be multilingual writers, who are very skilled communicators in their first or second languages and who have great cross-cultural linguistic knowledge, but less experience writing and reading English. Some multilingual writers may have internalized organizational structures or styles for academic writing from their first language that are at odds with standard patterns in English. Still other writers may have a tenuous grasp on the subject that they are writing about, and their conceptual struggles may manifest themselves in their writing. At the same time, many researchers find writing difficult and as a consequence avoid writing, procrastinate, and eventually end up in stressful time crunches that reinforce their dislike for writing.

Given what varied experiences and strengths researchers-in-training may bring, you should ask your mentees about their previous experience and about their perceived strengths and areas for improvement. Acknowledge that research writing is always hard work, especially when researchers are learning to write in a new field or in a new genre, when they are making arguments that are more complex than they have made before, or when they're not sure what their findings mean or what is interesting or important in their findings. For these reasons, research writers need their mentors to be patient and encouraging as well as critical. And above all, mentors need to *normalize revision*; revision is a normal and crucial part of writing, not a sign that a writer has failed because she or he did not achieve perfection in an early draft. Research shows that experienced, successful writers spend a lot of time revising their work.

Writing is hard work and time-consuming for mentees. Let's face it—helping mentees learn to become strong research writers is hard work and time-consuming for you as a mentor. Although the recommendations that follow should make the time you spend on mentoring more successful and effective for you and for the writers you are mentoring, there are no shortcuts. Reading drafts carefully and critically and charitably; discerning what is and what is not working well in a draft;

Key Principles In Mentoring Writers

1. Signal from the very start and reinforce frequently that excellent writing is a high priority for you, for your research group, and for all successful researchers.
2. Figure out what your mentees already know about research writing and find ways to help them learn what they need to learn.
3. Work collaboratively with your research mentees to motivate them to write every week, sometimes every day.
4. Talk with your mentees regularly about their writing—analyzing successful examples, planning new pieces of writing, brainstorming, kicking ideas around, discussing drafts, and planning revisions.
5. Schedule meetings to plan and work on drafts. Make discussions of in-progress writing in progress part of the culture and rhythm of your research group.
6. Give clear, specific, encouraging feedback. Start first with global concerns and then move on to more local, smaller concerns.
7. Be sure your feedback identifies strengths and potential as well as problems.
8. Honor and celebrate successful research writing within your research group.

Adapted from the W.H. Freeman Entering Mentoring Series, 2017.

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giving clear, specific, helpful, and encouraging feedback; reading yet another draft; meeting to talk through your feedback and the writer’s plan for revision—these critical tasks will always require concentration and time. But they are what every writer needs in order to learn and to improve— to become the strongest possible research writer they can be and to launch their research career.

Here are some specific strategies, drawn from research and practice, for mentors to try.

Before the First Draft

Find ways to signal that writing is crucial to research in your field and that mentoring researchers to become strong writers is a high priority for you and for your research group.

When, for example, a prospective researcher interviews with you, talk about writing and your commitment to mentoring writing. If you use some form of written expectations, such as a mentoring compact, you might consider including a section for your mentees on writing. Create a culture within your group of sharing and discussing drafts and of sharing and celebrating successful writing. In your meetings or discussions, always find time to talk about writing—even long before it is time to begin writing.

Talk with trainees about their writing processes, and yours. You might read and discuss writing resources, which offer valuable advice about establishing good habits for academic writing. You might also want to share some drafts of your own research writing in progress, seeking feedback from your mentees—learning to give constructive, critical feedback helps writers grow, and sharing your drafts will give you valuable feedback and model the drafting, critique, and revision process that you are trying to teach.

Recognize that *talk* is a crucial part of writing. Be sure that you are talking regularly with trainees about their writing in progress. Your mentoring discussions about research questions, methods, literature, and results are all critical for helping a newer researcher figure out how they will explain their research project in research publications, in funding proposals, in presentations, and in interviews. In discussions, ask questions that point toward future writing, such as

“How are you thinking about organizing your literature review?”

“How might you phrase that as a research question?”

“In your results, what’s new? What’s most significant?”

These kinds of questions and many others help researchers clarify their thoughts through talk and help them prepare for writing. And by your choice of questions, you are helping reinforce the key principles of scientific research and helping researchers imagine the audiences for whom they will be writing.

Your trainees will benefit if you ask them to prepare and discuss the main information and arguments in their papers. Researchers benefit from having to organize information in a logical outline and giving colleagues a chance to ask questions and offer advice *before* investing hours and hours in drafting sentences and paragraphs. You might ask them to prepare and discuss informally, with you and with peers, a few PowerPoint slides outlining the main information and arguments they hope to include in their paper. Another good reason to invest time upfront clarifying key ideas and arguments: if you and your mentee do *not* clarify and agree on the main points and arguments for the paper early in the process of writing, don't be surprised if your mentee is reluctant to make major changes after she or he has invested all the time that it takes to write a full draft.

New research writers need to develop a robust understanding of the genres commonly written by researchers in their discipline. Strong, successful research writers can take an aerial view of a document and can talk intentionally about the purpose of a particular piece of writing and about the choices authors have made about the content and organization for a given genre. Mentors should work systematically with mentees to identify and to analyze the key genres (or kinds of writing) in relevant fields or subfields, looking at what a particular kind of writing accomplishes and how it is tailored to a particular audience. For each key genre, mentors should first explore mentees' experience and understanding about that genre. As you have these discussions, you might want to ask trainees to analyze, together with you, the different kinds of articles in major journals in your field. In talking about genre, try to focus not on surface features of a genre (e.g., the citation system) but aim to develop—in yourself as a mentor and in your mentees—an ability to talk about the rhetoric of each genre; that is, the purpose of that genre, its audience, and its persuasive elements. For example, talk systematically about which questions get answered in the introduction, in the literature review, in the methods, in the results, and in the discussion sections. How is information organized *within* a particular section (such as the results section)? How much detail do authors give? What do the authors assume about the knowledge their readers already have about the topic under study?

Engage in “prewriting.” Before your mentee begins drafting a proposal or research report, use your conversations to help your mentee plan and do what is called “prewriting.” You can use your time—and your mentee's time—wisely by doing some explicit planning of a paper before your mentee starts actually drafting sections of it. Through collaborative talk and questions, you can help an author clarify the purpose of a piece of writing, central research questions, a plan, an outline, lists of main points, and the logic of an argument. Moreover, you can capture good ideas, plans, and important language—the mentee's and yours—by writing them down often as they emerge in these conversations. Your conversation and interest and encouragement also provide crucial motivation for doing the hard work of starting a writing project. And by correcting major misconceptions at this stage, you're helping writers, rather than waiting for a writer to invest countless hours in writing a full draft that may be misguided in some fundamental ways.

Set intermediate deadlines for portions of a draft, and insist that mentees meet those deadlines. Less experienced research writers need to write a partial draft long before they think they are ready to write, in order to give mentors a chance to give formative feedback and in order to give mentees plenty of time to revise. Early drafts, tough but encouraging critical feedback, and lots of revisions—these are what produce strong thinking and strong scientific writing. You might consider scheduling a weekly draft discussion for all lab members, with different members scheduled to share

their work each week. It is natural for busy postdocs or graduate students to fall behind with deadlines, and of course mentors should be understanding and flexible, but you are not doing your mentees a favor if you allow them to delay writing for too long. Be sure your expectations for writing are clear and that the mentee understands the consequences of falling behind in writing given the number of publications they are expected to produce while working with you.

Ask your trainees to include a cover sheet with each draft. Each time your mentee provides you with a draft of their writing it should be accompanied by a cover sheet, which can orient you as a reader. This cover sheet might include relevant questions, such as

- What is this draft?
- Who is the intended audience?
- How is it organized?
- What are your main points?
- What do you think is working well? What are you pleased with?
- What would you especially like me to focus on as I read, or what would you like my help with?

Answers to these questions can guide your reading, and you will be able to use your time more effectively and be sure to respond to the writer's needs. Learning to reflect critically on their own writing is valuable for writers as well; experienced writers can talk effectively about their writing, can offer an aerial view of a draft, and can ask readers for particular kinds of help.

Giving Feedback and Guiding Revisions on Drafts

Encourage mentees to welcome criticism and advice about their writing. Before you ever give specific feedback on a draft, find comfortable ways to ask your mentees about their experience receiving feedback on drafts and about their feelings about feedback and criticism. Talk about your own feelings about advice and criticism and encourage your mentee to welcome and consider all feedback, to ask for clarification during an in-person conversation, and to feel comfortable choosing not to accept some advice but justifying that choice. Explain that the strongest, most successful writers seek out tough, critical readers while their writing is still changeable.

Explain your approach to feedback and contextualize your comments. For example, if you have commented only on big ideas or the next steps you are suggesting, be sure to tell that to the writer. Otherwise, it is easy for a writer to assume that because you have not commented on something that means there are no problems with it. If you commented on local concerns only in one section but similar problems continue in other parts of the draft where you did not comment, be sure to explain this lack of feedback that so that writers do not have to guess what it means.

Focus first on global concerns before local concerns. In your reading, in your comments, and in your conversations with the writer, focus first on whether the big picture is working well by addressing *global, highlevel concerns* like these:

- Is the central research question clear?
- Is the significance of the research clear and persuasive?
- Is the progression of ideas and arguments logical?
- Does the writer demonstrate a clear understanding of the major concepts under study?
- Does the review of literature emphasize the most important ideas?
- Are findings clearly explained and easy to grasp—in figures and graphs as well as in the text?
- Are ideas thoroughly explained?
- Is the discussion focused on the most important points?

Later in the process of writing and revising, when the big stuff is working pretty well, narrow your focus and the writer's to more *local concerns* like these:

- Are there effective transitions between sections?
- How can the style be improved?
- Where do sentence or word problems interfere with the writer's ability to communicate clearly?
- Are there any grammatical errors?
- How can the word choice be improved?
- Are there punctuation errors?
- Are there proofreading mistakes?

Why is it important to start our feedback with global concerns? First, it is just a matter of efficiency—you have limited time to give feedback and your trainees have limited time to revise, so there is not much point to your commenting on small edits and not much point to the writer's making small edits when the writer needs to make larger changes. Second, research shows that less experienced writers are often confused by what faculty and mentors want them to concentrate on in their writing and in their revisions. They may think, for example, that correcting semicolon mistakes or rephrasing part of a sentence is as important as clarifying the logic of their discussion or anticipating and addressing counterarguments or emphasizing some ideas and subordinating others. And mentor comments on their writing too often lead writers to make only superficial revisions to words and sentences, overlooking larger conceptual, rhetorical, and structural revisions that would most improve a paper. By starting your feedback with global concerns, mentees get clear guidance from you about how to strengthen their ideas, their analyses, and their arguments, so that they have papers worth editing and polishing. *Then* you can turn your attention—and your trainees' attention—to improving sentences, words, and punctuation.

Identify strengths and potential in a draft, teach from success, and offer encouragement. In your comments, instead of jumping right into what’s wrong or needs improving, try starting with what you see as the specific strengths in a draft, what’s promising, and what’s working well. And it’s important to make some of your praise specific, as specific as some of your criticism. So instead of saying “Good start,” or just “Good,” try identifying what in particular is working well in a draft. This does not mean to offer false or insincere praise, but writers need to know what they are doing well and they need to see you as a reader who is genuinely interested in what they have to say and eager for them to succeed, rather than seeing you only as an error hunter. Teaching or coaching for success means if a writer has done something well in one section of a draft (if, for example, their topic sentences orient a reader well to the topic and main point of a paragraph) but not in another section, you can encourage the writer to do what they have already done well elsewhere.

Be direct and clear in your request for revisions. When giving feedback, indicate in specific terms how much work remains to be done. For example, “This will need a fair amount of revision in order to clarify your key research questions and to report your key findings effectively. As you revise, here are my key suggestions: (1) . . . ; (2) . . . ; (3)” Or “After you’ve worked on focusing the literature review around just a few central concepts, you’ll need to do some substantial editing to clarify sentences. I’ve shown the kinds of edits in the first paragraph of the lit review, but the rest of the draft needs that same kind of editing.” You can be clear and constructive in your feedback, even if you are delivering bad news, but you are not doing a writer any favors if you hide or sugarcoat how much work remains to be done.

Ask writers to document their revisions. When you’re reviewing a revised version of something you’ve read before, ask the writer to attach a cover sheet explaining the major changes they’ve made since you last read it. Asking trainees to do this signals that you expect them to make major revisions before you read something again. This kind of cover letter resembles what you would write in a cover letter or email with a revised manuscript if you received a “revise and resubmit” decision from a journal editor. In addition, you might want to ask the trainee to use “track changes” so that you can focus your reading on what’s changed.

Close your comments with some encouragement and a look forward. Be sure to include notes of encouragement and expectation with your feedback. For example, you might say, “Looking forward to reading the next draft of this,” or “Looking forward to seeing this in print soon!” or “Looking forward to meeting on Thursday to talk through your plans for revising.”

Within your research group, create a culture that celebrates important milestones in writing. Acknowledge and celebrate proposals and manuscripts when they are submitted, when revisions are completed, grants funded, publications accepted, and publications appear.

Mentors play a critical role in helping researchers-in-training become excellent, independent writers. Be sure to set the bar high for your trainees’ thinking, research, and writing and then provide them with support to meet those expectations. If at any point you feel that a mentee requires additional feedback and support, seek out local resources and encourage your mentee to take advantage of them.