Research Ethics Workshop:
Promoting Ethics in Research

Thursday
May 7th, 2015
8:30 am – 5:00 pm

Sponsored by
UC San Diego Research Ethics Program in cooperation with
the University of Cincinnati Office of Research
For further information about this workshop, contact the authors:

Michael Kalichman, Ph.D.
mkalichman@ucsd.edu
858-822-2027

Dena Plemmons, Ph.D.
dplemmons@ucsd.edu
858-822-2649

Acknowledgements: An initial draft of this workshop was prepared based on advice obtained in a consensus conference convened at Asilomar Conference Grounds in California, March 11-15, 2012, with support from a National Science Foundation (NSF) funded project titled "Integrating Ethics Education: Capacity-Building Workshops for Science and Engineering Faculty" (NSF Grant #1135358). While the contributions of all participants were invaluable and much appreciated, errors in content or form are solely the responsibilities of Drs. Kalichman and Plemmons, Co-PIs for the NSF grant. Workshop participants included: John Ahearne (Sigma Xi), Melissa Anderson (University of Minnesota), Mark Appelbaum (UC San Diego), Yuchen Cao (UC San Diego), Michael Davis (Illinois Institute of Technology), Chris DeBoever (UC San Diego), Mark Frankel (AAAS), C.K. Gunsalus (University of Illinois at Urbana-Champaign), Elizabeth Heitman (Vanderbilt), Joseph Herkert (Arizona State University), Rachelle Hollander (National Academy of Engineering), Crane Huang (UC San Diego), Deborah Johnson (University of Virginia), Nancy Jones (National Institute of Allergy and Infectious Diseases, NIH, DHHS), Michael Kalichman (UC San Diego), Nelson Kiang (Harvard Medical School), Philip Langlais (Old Dominion University), Francis Macrina (Virginia Commonwealth University), Brian Martinson (HealthPartners Research Foundation), Michael Mumford (University of Oklahoma), Ken Pimple (Indiana University), Dena Plemmons (UC San Diego), Patrick Wu (UC San Diego), and Guangming Zheng (UC San Diego).
8:30 am  
Registration

9:00  
*Introduction and Overview*

9:30  
*Codes of Conduct*

10:30  
Break

10:45  
*Checklists*

11:45  
*Cases: Introduction*

12:00 pm  
Working Lunch: *Cases*

1:00  
*Summary of Lunch Discussions*

1:45  
*Agreements: Individual Development Plans*

2:45  
Break

3:00  
*Group Policies*

4:00  
*Assessment*

4:30  
Closing Summary, Next Steps, Workshop Evaluation

5:00  
Adjourn
# Table of Contents

Agenda ........................................................................................................... 1
Table of Contents ......................................................................................... 2
Introduction and Overview ........................................................................ 3
  Description and Learning Objectives ..................................................... 3
  Instructors ............................................................................................... 4
  What is Research Ethics? ........................................................................... 5
  Why teach Research Ethics? ....................................................................... 7
  Rationale for Ethics in Context ................................................................. 8
  Mentoring and Teachable Moments ....................................................... 9
Codes of Conduct ......................................................................................... 11
Checklists .................................................................................................... 12
Cases ............................................................................................................ 14
Agreements: Individual Development Plans .......................................... 17
Group Policies ............................................................................................. 19
Assessment .................................................................................................. 21
Recommended Resources ......................................................................... 26
  Contents ................................................................................................... 26
  Selected Resources: By Topic ................................................................. 27
  General Resources .................................................................................. 31
  Other Approaches for Ethics in Context ............................................... 36
Evaluation Form .......................................................................................... 37
Description

This workshop is designed to assist research faculty in creating concrete, discipline-specific strategies to incorporate research ethics education into the context of the research environment. The workshop is grounded in a recognition that many research ethics issues are relevant to the practice of scholarly and creative activities spanning the full range of science, engineering, and technology.

The long-term goal of this workshop is to promote education in the ethical dimensions of research. This educational need is, in itself, an ethical obligation for the research community, and is also increasingly encouraged, if not required, internationally.

Participants will be introduced to rationales, content, approaches, and resources sufficient so that they will have the means to develop and implement research ethics education in their research environment.

Learning Objectives

On successful completion of the workshop, in the context of their particular research environment, participants will be able to:

1. Articulate rationales for integrating research ethics education
2. List and describe ethics topics suitable and useful to be addressed
3. List and describe approaches for integrating research ethics education
4. Design one or more activities to introduce research ethics
Dena Plemmons, an anthropologist at UC San Diego, is a research ethicist with both the Research Ethics Program at UC San Diego and the San Diego Research Ethics Consortium. Dr. Plemmons leads seminars and train the trainer workshops on research ethics, and teaches courses to help NIH and NSF grantees meet requirements for training in the responsible conduct of research. Her work in the field of research ethics has ranged from consulting in Ghana, Taiwan, and Mexico on ethics curricula in research environments to serving as 2009-2011 Scientist in Residence for ethics and science education at the Montgomery Middle School in San Diego. Dr. Plemmons was part of a small team representing the U.S. as part of a delegation from the AAAS to meet with counterparts from the China Association of Science and Technology in September 2012; the purpose of this ongoing program was to present and discuss cases to promote dialogue between scientists socialized in the two different cultures (U.S. and China) about the ethical dimensions of the practice of science. In early 2013, she played a prominent role as one of the hosts for a delegation of 10 people from South Korea who came to UC San Diego for a weeklong series of programs and meetings so as to inform their own plans for national approaches to research ethics in Korea. Dr. Plemmons was elected a AAAS Fellow in 2012. She has been active in the American Anthropological Association, serving as Chair of the Committee on Ethics for four years, and leading the task force which reviewed and revised the Association’s code of ethics. She received the President’s Award in 2011 for her work on behalf of the Association.
What is Research Ethics?

The subject of this workshop is research ethics. The focus is a very practical one: How should we, as researchers, act?

Unfortunately, the choices we face are not always clear. And even those cases that are clear may at times be better characterized as "right vs. right" rather than "right vs. wrong." For these reasons, our obligation is not necessarily to make the right decisions, but to strive to make the best possible decisions. In this context, "ethics" should not be confused with ethical theory, morality, and/or simply following the rules.

While there are many possible formulations for the scope of research ethics, one useful summary for the purpose of this workshop is to focus on our obligations as researchers. Those obligations might be summarized to include research, other researchers, and society, but also a fourth overarching responsibility in all cases to ask questions:

1. Research:
   How should research be conducted so as to meet our obligations to preserve and promote the integrity of research findings?

2. Researchers:
   How should researchers interact with one another to meet our obligations to other researchers?

3. Society:
   How should researchers interact with the larger communities, academic and public, to meet our obligations to the society in which we live and work?

4. Asking Questions:
   How, when, and where should researchers be prepared to ask questions about the conduct of science so as to meet their obligations to the research, researchers, and society?
What topics are covered under the heading of "Research Ethics"?

<table>
<thead>
<tr>
<th>Topics recommended by NIH</th>
<th>Examples of other Specific Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Management</td>
<td>Stem Cells</td>
</tr>
<tr>
<td>Conflict of Interest and Commitment</td>
<td>Deception</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Dual Use Technology</td>
</tr>
<tr>
<td>Authorship and Publication</td>
<td>Sabotage</td>
</tr>
<tr>
<td>Peer Review</td>
<td>Use of statistics</td>
</tr>
<tr>
<td>Mentoring</td>
<td>Image manipulation</td>
</tr>
<tr>
<td>Social Responsibility</td>
<td>Reproducibility</td>
</tr>
<tr>
<td>Research Misconduct</td>
<td>Open access</td>
</tr>
<tr>
<td>Human Subjects</td>
<td>Ghostwriting</td>
</tr>
<tr>
<td>Animal Subjects</td>
<td>Censorship</td>
</tr>
<tr>
<td></td>
<td>Managing a research group</td>
</tr>
<tr>
<td></td>
<td>Managing budgets</td>
</tr>
<tr>
<td></td>
<td>Asking Questions, Dispute Resolution, Whistleblowing</td>
</tr>
</tbody>
</table>
Why Teach Research Ethics?

Many who believe we should teach research ethics have a clear idea of why we should do so. However, even a moment’s reflection reveals many possible motivations for such teaching. Based on a series of interviews with teachers of research ethics, the range of possible goals was numerous and diverse (Kalichman and Plemmons, 2007). And the many possible outcomes vary greatly along dimensions such as importance, feasibility, and measurability. An understanding of this range of possible goals is a precursor to making good choices about not only what might be done to teach research ethics, but what is worth doing.

What are the goals for teaching research ethics?

- Meet federal, institutional, or departmental requirements for teaching research ethics?
- Enhance public perception of the research community?
- Protect the interests and welfare of the human and animal subjects of research?
- Improve choices of research to be pursued and research outcomes?
- Decrease Research Misconduct?
- Decrease disputes and misunderstandings?
- Increase responsible conduct in research (RCR)?
- Increase knowledge about RCR?
- Increase moral or ethical decision-making skills? other skills?
- Increase positive attitudes and disposition for RCR? moral sensitivity?
- Increase conversations about these issues?

While these goals are clearly distinguishable from one another, there is also considerable overlap. For example, an intervention designed to increase knowledge might at the same time meet departmental requirements for teaching research ethics.
Rationale for Ethics in Context

If teaching research ethics is taken to be important, then what role if any is there for ethics teaching in the context of the research environment? A case might be made that the range of goals one might reasonably consider is so wide that the research environment is neither sufficient nor perhaps appropriate to be the sole venue for delivering research ethics education. However, if it is instead seen as an appropriate adjunct to other institutional programs, then a more modest agenda might be appropriate.

With that in mind, what is the value added from integrating ethics into the fabric of what we do as researchers rather than as a separate activity or program? In the context of the research environment, researchers:

1. *Learn by example:* researchers have the opportunity to learn by observing how others address ethical challenges.

2. *Learn in context:* researchers can see how what they do is intertwined with the norms and standards of practice in their particular research discipline.

3. *Learn by doing:* researchers can learn through the experience of addressing ethical challenges in the context of performing their research.

4. *Learn what is most important:* researchers can learn about the specifics that are most important to their particular practice of research rather than the much longer list of everything that is potentially relevant to other areas of research.

5. *Continue to learn:* working in a research group is an ongoing opportunity for continuing education, and addressing new and evolving issues that might not otherwise be covered in courses.
Mentoring and Teachable Moments

One of the most important mechanisms by which knowledge is passed from one generation to the next is Mentoring. In the sense that a mentor is an individual who has succeeded by overcoming the hurdles to success, he or she is in the best position to help a trainee with facing those same hurdles. Mentoring (teaching), in the context of research groups, is recognized as an important part of research training. While little has been written about teaching research ethics in this setting, it is clear that much can be learned about the roles, responsibilities, and joys of science through the process of conducting research.

Mentoring might include many topics, one of which is the responsible conduct of research or research ethics. One purpose of this discussion will be to consider the proper role for such one-on-one or small group mentoring in teaching research ethics, the topics that should be covered, and specific strategies for mentoring in research ethics.

Teaching about research ethics in the context of the research environment is widely encouraged (Whitbeck, 2001; Fryer-Edwards, 2002; Davis, 2006; Peiffer et al., 2008). The presumption is that research mentors are in an ideal position to convey standards of conduct. Unfortunately, such mentoring is infrequent or even non-existent (Brown and Kalichman, 1998; Swazey and Anderson, 1998). Although this is not happening explicitly, that does not mean an absence of socialization into science. Clearly, trainees do learn about their ethical obligations and responsibilities by doing and observing. This may often result in sufficient education, but the worry is that this ad hoc approach risks that the lessons learned will be too little, too late, or wrong. The alternative proposed here is that research mentors identify and take advantage of Teachable Moments.

Because research training environments vary greatly, it is not possible to prescribe one common set of teachable moments. Instead, it is worth noting that many opportunities to introduce discussion about research ethics issues might be identified for any given research group or discipline. Some examples appropriate to at least some research training environments include:

- One-on-one mentoring
- Ad hoc conversations
- Research group meetings
- Journal clubs
- Research lecture and seminar series
Within each of these opportunities for education, there are numerous tools that might be adopted to promote thoughtful discussion and learning about research ethics. Some of these include:

1. Review of professional *Codes of Conduct*

2. Following a *Checklist* of mentoring responsibilities

3. Discussing historical, current, or fictional *Cases* that illustrate research ethics challenges

4. Adoption of mentor-trainee *Individual Development Plans* outlining mutual roles and responsibilities

5. Definition and adoption of research group *Policies* regarding one or more aspects of responsible conduct of research

6. Reading or viewing of recommended *Resources*, such as books, websites, and videos on the subject of responsible conduct of research
Nearly all scientists work within a discipline that is represented by a professional society, association, or organization. Most of these groups have created documents defining what it means to be a member of that particular discipline. These *Codes of Conduct* might include aspirational statements about values and principles and/or specific guidance about, for example, criteria for authorship. Finding, reading, and discussing such codes are an opportunity to reflect on professional responsibilities.

**Opening Discussion**

Is your discipline a profession?

What do we mean by "profession" and how does that translate to your particular domain of science or engineering?

**Exercise**

Each workshop participant should bring a copy of a professional code of conduct most appropriate to the practice of her or his profession. If they do not know of a code, then they can check the Illinois Institute of Technology website ([http://ethics.iit.edu/ecodes/bibliography](http://ethics.iit.edu/ecodes/bibliography)). If still unable to find an appropriate code, the workshop instructor can propose a surrogate.

In this section of the workshop, the focus is on the *professions* of sciences and engineering. Participants will be asked to explain their respective codes.

**Suggested Questions for Further Discussion**

1. What is similar among the codes presented?
2. What is different?
3. To what extent is it possible to understand key elements of codes from a discipline different than your own?
4. Are the differences due to differences between disciplines, or an oversight on the part of one of the codes?
5. Do codes from disciplines different than your own contain elements that might be translatable to your own discipline?
6. How might such codes be appropriate for encouraging discussion in your research setting?
7. When/where should trainees be introduced to their professional code(s)?
8. How might the code be used to illustrate practice in your discipline?
Checklists

Much of teaching about research ethics can be handled effectively through one-on-one mentoring on an ad hoc basis. The fact that this happens all too rarely may be primarily a simple matter of being overlooked. An easy solution is to create a reminder checklist for items particularly important to cover (e.g., see Gawande, 2011) as well as stages of training when those items might best be covered. The goal is to ensure that practical issues will be addressed at appropriate times of graduate student training.

The material to be covered will vary by discipline, but some topics likely to be important for trainees in any discipline include the following:

1. Criteria for authorship
2. Recordkeeping
3. Standards for sharing
4. Ownership of materials (including plagiarism)
5. Risks of bias and how they can be addressed
6. Roles and responsibilities for mentors and trainees
7. Risks and benefits of collaborations
8. Conflicts of commitment
9. Asking questions, consensus building, and whistleblowing

Questions for Discussion

- Are other items missing from this list that are likely to be important for most if not all disciplines?
- What items might you want to add specific to your focus in science and engineering?

Exercise

- What, if anything, would be important to know in your research group about each of the above items?
- When would those items be best addressed?
<table>
<thead>
<tr>
<th>Item</th>
<th>When to address?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td></td>
</tr>
</tbody>
</table>
What are case studies?

Based on real or contrived scenarios, case studies are a tool for discussing scientific integrity. Cases are designed to confront the readers with a specific problem that does not lend itself to easy answers. By providing a focus for discussion, cases help researchers to define or refine their own standards, to appreciate alternative approaches to identifying and resolving ethical problems, and to develop skills for dealing with hard problems on their own.

How should cases be analyzed?

Many of the skills necessary to analyze case studies can become tools for responding to real world problems. Cases, like the real world, contain uncertainties and ambiguities. Readers are encouraged to identify key issues, make assumptions as needed, and articulate various options for resolution. In addition to the specific questions accompanying some cases, an effective analysis will typically address the following criteria:

- **Interests**
  Who is affected (individuals, institutions, a field, society)? What significant interest(s) (material, financial, ethical, other) do those affected have in the situation? Which interests are in conflict?

- **Principles**
  What specific, generalizable, and consistent principles (e.g., to tell the truth, to do no harm) are applicable to this case?

- **Alternate answers**
  What other courses of action are open to each of those affected? What is the likely outcome of each course of action? What actions could have been taken to avoid the conflict?

- **Defensible**
  Are the final choice and its consequences defensible in public (e.g., reported through the media)?

Is there a right answer?

- **Acceptable Solutions:**
  Most problems will have several acceptable solutions or answers, but a single perfect solution often cannot be found. At times, even the best solution will have unsatisfactory consequences.

- **Unacceptable Solutions:**
  While more than one acceptable solution may be possible, not all solutions are acceptable. For example, obvious violations of specific rules and regulations or of generally accepted standards of conduct would typically be unacceptable. However, it is
also plausible that blind adherence to accepted rules or standards would sometimes be an unacceptable course of action.

- *Ethical Decision-making:*
  Ethical decision-making is a process rather than an outcome. The clearest instance of a wrong answer is the failure to engage in that process. Not trying to define a consistent and defensible basis for decisions or conduct is unacceptable.

**How might cases be introduced into the research environment?**

Cases are best seen as an opportunity to foster discussion among several individuals. As such, they might be most appropriate as an exercise to be used in the context of a research group meeting, journal club, or as part of a research lecture series.

**Exercise**

During the lunch break, workshop participants will be assigned to small groups for the purpose of reviewing a case (scenario) describing a research ethics challenge. Ideally discussion group participants should be from diverse disciplines and people who do not already know one another well. This will increase the chance to better see challenges and find solutions for the case being reviewed. It also hopefully serves to increase personal connections among diverse members of the institution who can turn to one another with future ethics and ethics training questions or challenges.
Case for Discussion

How much is too much?

Qiao Zhi has recently arrived to work as a postdoctoral research in the United States from China. She studied English for many years as part of her schooling in China, but she had little real world experience in conversing and writing English. Qiao Zhi is a very talented scientist in her field and quickly found a position in a research group, largely consisting of other Chinese researchers and with Professor Wang, who was trained in China as well. During her first year of work, Qiao Zhi was extraordinarily lucky to have made an interesting finding and Professor Wang encouraged her to write the work up for publication in the journal Science. Qiao Zhi struggled to write the paper in English, but soon found that with the help of the Internet she could easily find phrases written well in English to express concepts that she wasn't sure of. Professor Wang lightly edited the paper written by Qiao Zhi, they submitted it to Science, and it was accepted for publication. Six months later, one of Wang's colleagues was looking at the Déjà vu website (http://dejavu.vbi.vt.edu/dejavu) and discovered that Qiao Zhi's paper received a very high score for using text duplicated from other papers. Wang took the concern of possible plagiarism to the Research Integrity Officer (RIO) at his institution. The RIO appointed a committee to determine if Qiao Zhi should be found guilty of plagiarism, an example of research misconduct. You are a member of that committee and have been asked to decide whether frequent use of phrases from other papers is plagiarism and if doing so should result in sanctions or penalties.

Recommended timetable:

During lunch:
- **Introductions (5 mins):**
  Introduce yourselves to one another, pick someone to serve as discussion leader (responsible for keeping discussion on track and on time), and someone to keep a written summary of key conclusions. If not all members of the group have already been introduced to the case, the group leader should read the case aloud.
- **Case Discussion (20 mins):**
  Collectively consider the (1) interests of individuals and groups in how this case is handled; (2) ethical principles or values at stake; (3) the alternative answers that might be considered as solutions; and (4) the rationales for selecting a particular choice of action agreeable to all.
- **Summary (10 mins):**
  As a group, figure out how best to articulate your findings of interests and principles that are at stake, the alternative answers to be considered, your recommended answer, and the rationale for choosing that answer.

After lunch
- **Presentation (~ variable)**
  Choose one member of your group to present your analysis, paying attention not just to the case per se, but also how this kind of exercise could be beneficial for your trainees.
Increasingly, various science organizations have proposed agreements or "individual development plans" (IDPs) to spell out mutual obligations for mentors and postdocs (AAMC, 2008a) and mentors and graduate students (AAMC, 2008b). The value of such agreements is summarized in a widely cited manual for training of graduate students (University of Michigan, 2011):

> Departments can affirm that mentoring is a core component of the educational experience for graduate students by developing a compact or agreement, relevant to the discipline or field of study, for use by faculty and the students with whom they work. Such a document would list the essential commitments and responsibilities of both parties, set within the context of the department’s fundamental values. This could be included in the departmental handbook and reviewed—or even signed—by both parties to acknowledge the mentoring relationship.

The Federation of American Societies for Experimental Biology (FASEB) provides on their website an IDP for postdocs, which is not only a template for planning one’s career, but also “serve[s] as a communication tool between individuals and their mentors” ([http://www.faseb.org/portals/0/pdfs/opa/idp.pdf](http://www.faseb.org/portals/0/pdfs/opa/idp.pdf)). The presumption is that such agreements will open channels of communication and serve as a reminder of mutual roles and responsibilities for a successful training experience.

**Discussion Questions**

1. Which of the sample development plan items (next page) is/are appropriate to your discipline?
2. Would such a development plan be useful or counterproductive in promoting responsible conduct?

**Exercise**

Using the sample plan as a starting point, design an IDP for your research group. In doing so, consider:

- What should be changed? Deleted? Added?
- How and when would you use such an agreement?

Present your draft agreement to the workshop participants.
# Sample Development Plan

<table>
<thead>
<tr>
<th>Student</th>
<th>Mentor/Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If in doubt, ask.</td>
<td>1. If in doubt, ask.</td>
</tr>
<tr>
<td>2. Meet with advisor once each ______.</td>
<td>2. Meet with student individually once each ______.</td>
</tr>
<tr>
<td>4. Request performance evaluations once each ______.</td>
<td>4. Provide performance evaluations once each ______.</td>
</tr>
<tr>
<td>5. Perform self-evaluation once each ______.</td>
<td>5. Request student self-evaluation once each ______.</td>
</tr>
<tr>
<td>6. Strive to meet expectations for recordkeeping, data ownership, sharing of data, credit, and authorship.</td>
<td>6. Provide guidance for expectations about recordkeeping, data ownership, sharing of data, credit, and authorship.</td>
</tr>
<tr>
<td>7. Maintain research records sufficient for others to reconstruct what was done.</td>
<td>7. Review original research records once each ______.</td>
</tr>
<tr>
<td>8. Pursue opportunities for professional development (e.g., writing, speaking, mentoring, learning and teaching about research ethics).</td>
<td>8. Propose opportunities for professional development (e.g., writing, speaking, mentoring, learning and teaching about research ethics).</td>
</tr>
<tr>
<td>9. Comply with government and institutional guidelines and regulations for the conduct of research.</td>
<td>9. Provide adequate information about relevant government and institutional guidelines and regulations for the conduct of research.</td>
</tr>
<tr>
<td>10. If e-mail communication is breaking down, schedule an in-person meeting.</td>
<td>10. If e-mail communication is breaking down, schedule an in-person meeting.</td>
</tr>
</tbody>
</table>
Misunderstandings and disputes among researchers are much more frequent than actual Research Misconduct (Martinson et al., 2005; Martinson et al., 2010). While some of these challenges may be unavoidable, many could be mitigated simply by clear and early communication. One way to meet this goal is by developing policy documents covering such issues as authorship or data management.

**Sample Policy**

**Authorship Policy**

*Criteria for authorship:*
To be included as an author on a paper, it is necessary to have made a substantial and new contribution essential to publication of the paper, to provide a good faith contribution to writing and/or editing of the manuscript, and to approve the content of the version submitted for publication.

*Criteria for acknowledgement:*
Contributions to the publication of a manuscript that do not meet the criteria for authorship should be recognized in the acknowledgements section of the paper.

*Order of authorship:*
If a paper has more than one author, and assuming all authors meet the "Criteria for authorship," then the first author will typically be the person who wrote the first draft of the manuscript, the last author will be the head of the research group, and authors listed in between will be listed in order of decreasing contributions to the project.

*Disputes about authorship:*
If anyone believes that someone proposed to be an author, or someone left off of the list of authors, has been not been given credit appropriate to their contributions, then they should raise their concerns with the head of the research group, who has ultimate responsibility within the group for decisions about allocation of credit.

*Appeals to decisions about authorship:*
In the event that the above guidance is insufficient to resolve a dispute about authorship, then the interested parties should each draft an anonymized version of their perspective on the issues at stake. These summaries will then be submitted to a mutually agreeable third party for a decision based on binding arbitration. If no clear decision is rendered, then a final decision will be made by a flip of a coin (or the equivalent if multiple competing options are proposed).
Examples of Possible Topics for Policies

- Dealing with particular human or animal subjects
- Recordkeeping
- Statistical Methods
- Data Sharing
- Contacts with media

Questions for Discussion

1. What topics might be appropriate for a group policy in your area of research?
2. Is it possible to have a policy that would be meaningful and not counterproductive?

Exercise

1. Identify a topic for a policy of common interest to all participants in the workshop.
2. Propose possible elements to be covered in the policy.
3. Select those elements for which there is agreement, and draft wording for the proposed policy.

How should a policy be implemented?

1. Handed out to new members of research group.
2. Annual or periodic discussions to review at group meetings.
3. Group collaboration to write or re-write policies to ensure ongoing relevance and clarity.
Assessment

Given the proposed teaching of research ethics in the context of the research environment, the goal of assessment is to determine whether the approaches proposed have had a positive impact. At a minimum this means two overlapping, but not necessarily identical questions:

1. What is the impact of your use of the proposed approach for teaching research ethics to your students?
2. What is the overall impact of use of the proposed approaches for teaching research ethics on students of faculty who have participated in workshops like this one?

We are proposing an assessment to address question #2, but in the process one that will hopefully reflect on the general value of the different approaches and help to answer question #1. However, while assessing impact might seem straightforward, it is not easily accomplished. Even the possible goals for assessment are highly diverse.

Goals of assessment

Assessments can address many different qualities of learning outcomes (e.g., Nightingale et al., 1996; Kalichman and Plemmons, 2007), including improvements or increases in:

- knowledge
- creative or critical thinking, problem solving, determining impact, or making plans
- moral reasoning, ethical decision-making, or sensemaking
- attitudes or values in the context of research ethics
- ability to communicate, or to prevent or resolve conflicts
- frequency and effectiveness of communication with others
- making good judgments
- successful recognition of ethical dilemmas in the practice of research

Given the many possibilities, it is neither feasible nor perhaps useful to consider assessing all of these outcomes in the context of research ethics interventions in the research environment.

Challenges to conducting assessments

Each of the above outcomes, and the many other possible outcomes, potentially requires a very different and very specific approach for assessment. Some outcomes might be best assessed by objective multiple choice questions, others by written answers to open-ended questions (e.g., how, if at all, has your ability to recognize ethical dilemmas been changed?) or requests to provide an analysis of a case that describes a research ethics dilemma, and still others might require interviews or focus group discussions. And even with an appropriate method for assessing an outcome, being able to ascribe any effect to a particular approach can be problematic (e.g., having only post-assessments for those exposed to the approach vs. pre- and
post-assessments from the same individuals vs. assessments for those exposed to the intervention as well as an appropriate control group).

**Criteria for choosing assessment goals**

Choosing among the many possible outcomes and measures should begin with whether a particular outcome meets the following criteria:

1. **Important**: The goal should address something that is particularly relevant (important) to the ethical or responsible conduct of science.

2. **Deficient**: Some things that are important may not in fact be lacking. The goal should address something that needs improvement or correction because it is deficient.

3. **Independent**: Even if something is important and deficient, it could be secondary to some other goal. Meeting the goal should be independent of first needing to meet other goals.

4. **Amenable to Intervention**: Even if something is important and deficient, we may have no realistic way to repair that deficit. The goal should be something for which we have, or we could reasonably produce or acquire, an intervention that would enable us to make a change.

5. **Measurable**: It is possible that there is something that we can change by intervention that is both important and deficient, but we have no means to assess our impact. The goal should be something for which we have the tools for defining measurable outcomes. [NOTE: Measurable outcomes can also include qualitative findings. The key is to have something credible to convince ourselves and others that there is some value added because of our efforts.]

6. **Magnitude**: It is possible that there is something that we can change by intervention that is important, deficient, and measurable, but the magnitude of our impact might be too small to be considered cost effective. The goal should be something for which we can produce a change of sufficiently large magnitude.

7. **Feasible**: Even if something reasonably meets all of the above criteria, it may not in fact be practical or feasible in the research environment because of the amount, type and availability of resources required or because of the characteristics of the research environment. The goal should be something that is feasible.

**Optional Exercise**

What challenges have you experienced in promoting some of the goals discussed above?

- Did you obtain feedback to indicate success in achieving your goal?
- If not, how might you assess the impact of what you did?

For the approaches we discussed today, what learning objectives would be realistic outcomes? What would be the most important outcome for your students after implementing some of these approaches?

How might you assess the impact?
Assessment

Assessment Plan

For the purposes of this project, we hope to obtain feedback both from the faculty participants in this workshop and from their students. The plans for each group are summarized below.

Faculty Feedback

Prior to the workshop and six months after the workshop we will ask you to complete a brief (2-3 minutes) online survey. Although we will need your name and e-mail address to invite your participation in the survey, your identifying information will be de-coupled from the data and not be part of any analysis, summary, or publication.

In addition to feedback on which of the proposed approaches you attempted, the two primary questions we hope to answer are:

1. Do you perceive that the proposed approaches are feasible, relevant, and effective?

2. Do you have observations or experiences consistent with the presumption of a positive impact?

Student Feedback

Prior to the workshop and six months after the workshop we will ask your trainees to complete a brief (2-3 minutes) online survey. Although we will need trainee names and e-mail addresses to invite participation in the survey, their identifying information will be de-coupled from the data and not be part of any analysis, summary, or publication.

As a control group, students are being surveyed similarly for those faculty who were interested in attending this workshop but unable to do so. In addition to feedback on which of the proposed approaches you attempted, the two primary questions we hope to answer are:

1. Do the students perceive that the proposed approaches are relevant and effective?

2. Do the students report outcomes consistent with the presumption of a positive impact?

The surveys we are using are provided on the following two pages.
Faculty Feedback Questions

1. During the most recent academic term, which of the following strategies did you use as a basis for discussion with one or more of your trainees (graduate students and/or post-docs)?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code of ethics or conduct for your research profession</td>
<td></td>
</tr>
<tr>
<td>Items on a checklist of research ethics topics</td>
<td></td>
</tr>
<tr>
<td>A real or fictional case to demonstrate research ethics issues</td>
<td></td>
</tr>
<tr>
<td>An Individual Development Plan establishing responsibilities for you and your students</td>
<td></td>
</tr>
<tr>
<td>A group policy addressing research ethics issues</td>
<td></td>
</tr>
</tbody>
</table>

2. For each of the above strategies that you used:
   A. Did you use this strategy in the context of a group meeting (e.g., journal club, discussions of data or research strategies) and/or one-on-one?

   Using a scale of agree/neutral/disagree, please rate the following statements:
   - In my particular research group, this strategy for teaching research ethics is
     - B. Feasible (it can be done)
     - C. Relevant (it is meaningful to our practice of research)
     - D. Effective (it helps to promote research integrity)

   A. How many trainees are part of your research group?
      - Graduate students _____   Post-docs ________

   B. Over the most recent academic term, how many hours did you discuss research ethics issues with one or more of your trainees (graduate students and/or post-docs)?

<table>
<thead>
<tr>
<th>In the context of:</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of more of the proposed strategies?</td>
<td></td>
</tr>
<tr>
<td>Other conversations?</td>
<td></td>
</tr>
</tbody>
</table>

3. Please note any observations you’ve had that speak for or against the effectiveness for your research group of any of the above strategies you have used.

4. Please share with us any other strategies, whether purposeful or ad hoc, you have successfully used to generate discussions about research ethics in your research group.

5. Please provide any other comments you may have.
## Assessment

### Student Feedback Questions

1. During the most recent academic term, which of the following strategies did your research mentor use as a basis for discussion with you?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code of ethics or conduct for your research profession</td>
<td></td>
</tr>
<tr>
<td>Items on a checklist of research ethics topics</td>
<td></td>
</tr>
<tr>
<td>A real or fictional case to demonstrate research ethics issues</td>
<td></td>
</tr>
<tr>
<td>An Individual Development Plan establishing responsibilities for your research mentor and you</td>
<td></td>
</tr>
<tr>
<td>A group policy addressing research ethics issues</td>
<td></td>
</tr>
</tbody>
</table>

2. For each of the above strategies that your research mentor used:
   A. Did your mentor use this strategy in the context of a group meeting (e.g., journal club, discussions of data or research strategies) and/or one-on-one?

   Using a scale of agree/neutral/disagree, please rate the following statements:
   B. Relevant (it is meaningful to our practice of research)
   C. Effective (it helps to promote research integrity)

3. Over the most recent academic term, how many hours did you discuss research ethics issues:

<table>
<thead>
<tr>
<th>With:</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your research mentor?</td>
<td></td>
</tr>
<tr>
<td>Others?</td>
<td></td>
</tr>
</tbody>
</table>

4. If the number of hours in question 3 was >0, then what impact, if any, did those conversations have on you?

5. Could you briefly describe any other approaches your mentor has used to generate discussions about research ethics in your research group?

6. Please provide any additional comments you may have.
Recommended Resources

The purpose of this section on readings is to provide a starting point for further information about the teaching of research ethics or responsible conduct of research, particularly in the context of the research environment. While all of the resources listed are recommended, this list is not intended to be comprehensive. Resources recommended as a starting point are written in bold.

Contents

Selected Resources: By Topic .....................................................................................................27

Agreements..................................................................................................................................27
Assessment (and Goals) ...............................................................................................................27
Cases ..........................................................................................................................................28
Checklists (see Agreements) ........................................................................................................29
Codes of Conduct .......................................................................................................................29
Group Policies (see Agreements) ...............................................................................................30

General Resources .....................................................................................................................31

General Web Resources ............................................................................................................31
Texts on Research Ethics ............................................................................................................31
Research Ethics Internet Courses ...............................................................................................32
Courses for Research Ethics Instructors ....................................................................................32
Fostering Integrity in Research ...................................................................................................32
Integrating Ethics in the Curriculum or Discipline ...................................................................32
Mentoring and Responsible Conduct .........................................................................................33
Mentoring .................................................................................................................................33
Readings for Students about Science and Ethics .......................................................................34

Other Approaches to Ethics in Context ....................................................................................36
Recommended Resources

Selected Resources: By Topic

Recommended Starting Resources are in bold.

Agreements

2. AAMC (2008b): Compact Between Biomedical Graduate Students and Their Research Advisors. https://www.aamc.org/initiatives/research/gradcompact
6. University of Wisconsin: Mentees Individual Development Plans Overview, Resources for each phase of the mentoring relationship. https://mentoringresources.ictr.wisc.edu/MenteeIDPOverview

Assessment (and Goals)

Recommended Resources


12. Schmaling KB, Blume AW (2009): Ethics instruction increases graduate students' responsible conduct of research knowledge but not moral reasoning. Accountability in Research 16:268–283

Cases


Recommended Resources


Checklists


Codes of Conduct


*Group Policies (see Agreements)*
General Resources

General Web Resources
1. Ethics Core Digital Library (National Center for Professional and Research Ethics). http://nationalethicscenter.org

Texts on Research Ethics

**Research Ethics Internet Courses**

1. Responsible Conduct of Research (University of Pittsburgh). [https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=displaymainpage&site=rp](https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=displaymainpage&site=rp)
2. Responsible Conduct of Research (CMDITR). [https://nationalethicscenter.org/rcrtutorial](https://nationalethicscenter.org/rcrtutorial)

**Courses for Research Ethics Instructors**

1. Teaching Responsible Conduct of Research (RCR) Certificate program: National Center for Professional and Research Ethics. [http://ethicscenter.csl.illinois.edu/teaching-rcr](http://ethicscenter.csl.illinois.edu/teaching-rcr)

**Fostering Integrity in Research**


**Integrating Ethics in the Curriculum or Discipline**


**Mentoring and Responsible Conduct**


**Mentoring**


Recommended Resources


Readings for Students about Science and Ethics


Other Approaches for Ethics in Context

The approaches discussed in this workshop are only selected examples that may be useful for you and your research environment. However there are many other approaches that might be worth considering. Some of these include the following:

1. Review of research plans or protocols:
   Depending on the nature of your research, it may be that existing documents outline methods, approaches, and/or plans for the conduct of your research. A careful review of those plans can be a useful exercise to identify ethical or values issues intrinsic to your research.

2. Guest speakers:
   Inviting others with appropriate expertise is an opportunity to gain helpful perspectives on topics that might be a good match for your area of research. Some possibilities might be a campus ombudsperson to talk about how to handle difficult questions, someone from internal audit services to discuss recordkeeping, or a representative from an office that has oversight responsibility for research with animal subjects, human subjects, or stem cells.

3. Illinois Two-Minute Challenge (2MC) Approach:
   Originally developed for teaching ethics and professional responsibility at the University of Illinois by C.K. Gunsalus, Director of the National Center for Professional and Research Ethics, two minute challenges are designed to present realistic dilemmas that arise concerning research ethics, along with a structured decision-making framework for assessing how to respond. Given the brief time commitment, this is a good option for use in the research environment. The National Center for Professional and Research Ethics (NCPRE) [http://ethicscenter.csl.illinois.edu] hosts a library of 2MCs that connect to other resources including teaching materials, bibliographies, videos, etc.
Research Ethics Workshop Evaluation

Your anonymous evaluation of this workshop will be invaluable for planning for future versions of this type of program.

Using a scale of 1 to 5 (1=very low, 5=very high), please rate the extent to which today's workshop helped you to meet the stated objectives for your particular research environment, which include being able to:

1. Articulate *rationales* for integrating research ethics education.____
2. List and describe ethics *topics* suitable and useful to be addressed.____
3. List and describe *approaches* for integrating research ethics education.____
4. Design one or more *activities* to introduce research ethics.____

5. Using a scale of 1 to 5 (1=very low, 5=very high), how would you score the overall value of this workshop?____

6. How, if at all, have your perceptions or understanding been changed by participating in today's workshop?

7. How would you describe the value of this workshop to your plans for teaching or promoting research ethics?

8. What changes would you recommend to help improve future versions of this workshop?

9. Please use the space below or the back of this page if you have any additional comments or suggestions about future workshops on this topic: