

The Responsible Researcher: Conscience and Collaboration

A Sigma Xi Critical Issues Symposium

November 11 - 12, 2011

Raleigh Convention Center - Raleigh, North Carolina

The progress of science and public trust in research depend upon ethical research practices. Sigma Xi believes that integrity is vital to all stages of research—from conducting experiments to discussing results with the media.

In 2011, we explored scientific integrity from several angles in a series of special sessions at the Sigma Xi Annual Meeting and International Research Conference in Raleigh, N.C. Speakers and topics are listed below along with their presentations if available.



List of Sessions and Speakers

Session I - Ethics & Integrity in Conducting and Reporting Research

Dr. Fred Grinnell

Founding Director of Ethics in Science and Medicine Program, University of Texas Southwestern Medical Center

Peggy Fischer

Assistant Inspector General for Investigations, National Science Foundation
[Research Integrity](#) (Link to slides)

Dan Vallero

Adjunct Professor of Engineering Ethics, Duke University
[Integrity: Metric of Research Success](#) (Link to slides)

Session II - Interrelationship of Science, Culture, Religion and Ethics

William Steiner

Dean of the College of Agriculture, Forestry and Natural Resource Management, University of Hawaii at Hilo

Introduction by Michael Crosby, Sigma Xi President, and William Steiner:

Brother Guy Consolmagno

Vatican Observatory

The Responsible Researcher: Conscience and Collaboration

A Sigma Xi Critical Issues Symposium

Stephen Rappaport

Knowledge Solutions Director, Advertising Research Foundation

[Peer Review Ethics: A Tale of Two Mindsets](#) (Link to slides)

Session III - Peer Review and Authorship across Borders & Disciplines

Mohammed Noor

Professor of Biology, Duke University

[A Necessary Evil: The Challenges of Peer Review From All Sides](#) (Link to slides)

Melissa Anderson

Center for Bioethics, University of Minnesota

[Authorship Across Borders](#) (Link to Slides)

David Resnik

Bioethicist, National Institute for Environmental Health Sciences, National Institutes of Health

[Importance of International Standards for Authorship, Publication and Peer Review](#) (Link to Slides)

Daniel Vaszgird

Director of Research Integrity & Compliance, West Virginia University

[RCR Standards Survey: Authorship](#) (Link to slides)

Workshop I - Challenges and Issues in Authorship

Stephanie Bird

Co-Editor-in-Chief of *Science and Engineering Ethics*

Workshop II - Communicating Science Through the Popular Media

Dennis Meredith

Science communicator including service at some of the country's leading research universities, including MIT, Caltech, Cornell, Duke and the University of Wisconsin, Author of *Explaining Research*

[Communicating Science](#) (Link to external slide show)

Catherine Clabby

Associate Editor, *American Scientist Magazine*

David Baron

Health & Science Editor, PRI's *The World*

Bora Zivkovic

Blogs Editor at *Scientific American*

Research Integrity

The Responsible Researcher: Conscience and Collaboration
Sigma Xi Annual Meeting
November 2011

Peggy Fischer, Ph.D., CCEP, CFE
Assistant Inspector General for Investigations
Office of Inspector General
National Science Foundation

Passion, Ethics and Trust

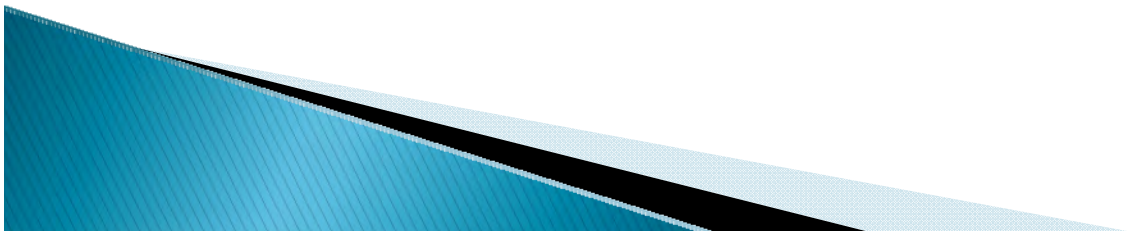
- ▶ How can you:
 - Sustain it
 - Foster it
 - Feed it
 - Grow it through others



Integrity challenges



- Have research ethics and research integrity changed?
- What is “responsible research”?
- Who is responsible for ensuring research integrity?
- Is science self-correcting?
- What about fraud?
- Do legal /government structures and academic administration /freedom conflict?



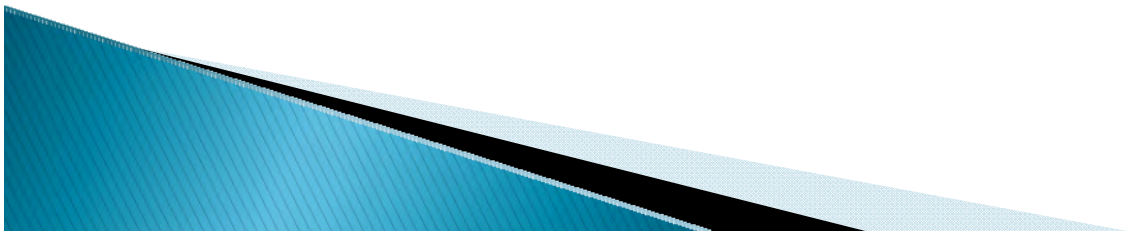
Integrity challenges



- Is research academia or a business, or have the two merged?
- What about the broader issue of responsible management of the research enterprise?
- Does its new rules change NSF's view of institutions having full responsibility for projects?
- How are government oversight /responsibility for funds related to institutional /individual responsibility?

Context

- ▶ Number of women, minorities and foreign-born dramatically increasing in research work force.
- ▶ Aging and retiring research workforce
- ▶ Science and engineering occupations are an increasing percentage of workforce (only 10% hold doctorates)
<http://www.nsf.gov/statistics/seind06/figures.htm>
- ▶ More transparency, focus on accountability,
- ▶ Greater skepticism (current climate of transparency, increased oversight and seeking waste in government funding)



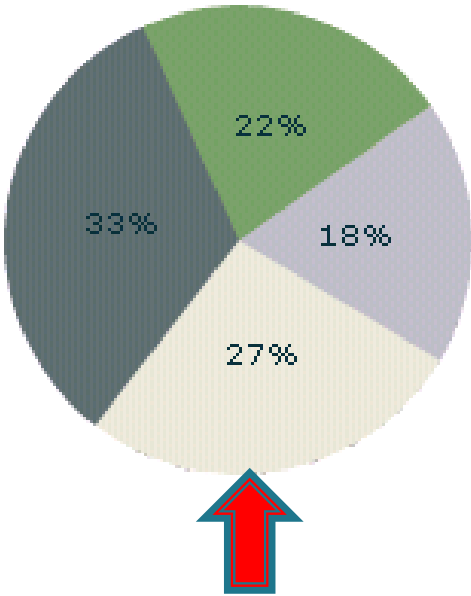
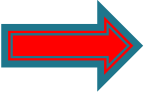
Why am I here?

- ▶ Represent Office of Inspector General
- ▶ OIG's focus on:
 - Fraud, waste, abuse
 - Research misconduct
 - Economy, efficiency
 - New and improved policies
- ▶ Tools of the trade:
 - Audits, inspections, evaluations, investigations, outreach
- ▶ Jurisdiction: NSF Programs and Operations

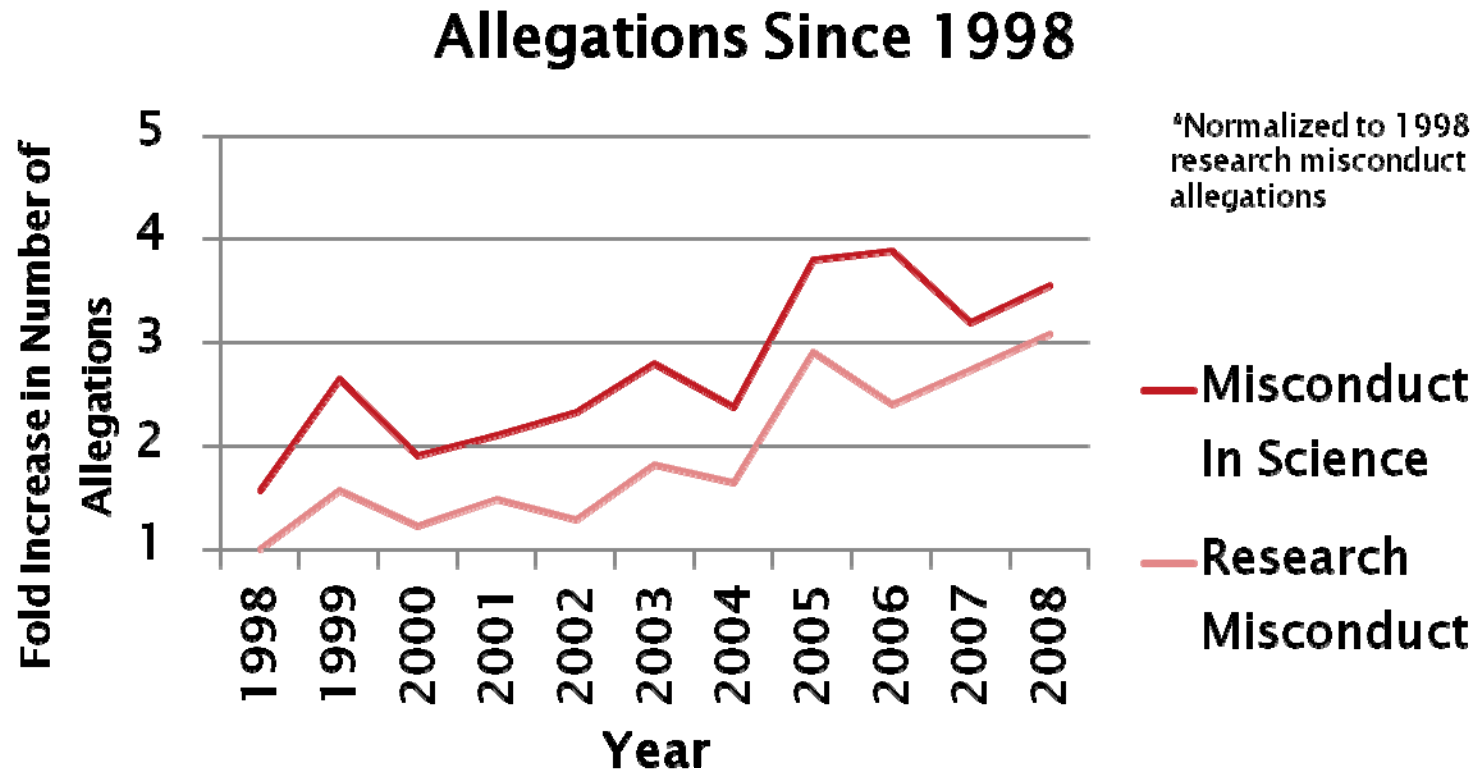


From the Government's Perspective, Grants are not "Small Business"

Award Type	Amount	%
Direct Payments	\$79.9B	33%
Grants	\$659.1B	27%
Contracts	\$537.8B	22%
Insurance	\$443.6B	18%
Others	\$2.2B	0%
Loans	\$0.7B	0%



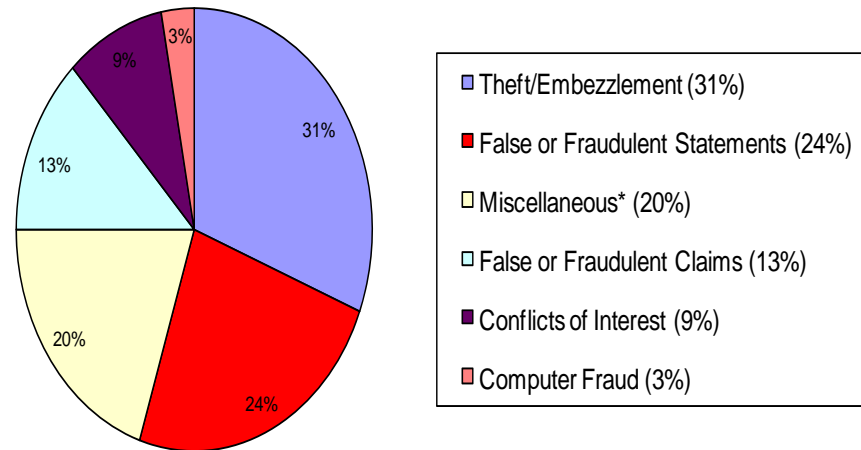
What do the numbers say?



What is Fraud?

- It's a civil or criminal investigation it is NOT Research Misconduct.

Common Types of Civil/Criminal Allegations



*Includes mail fraud, false identification insurance fraud, impersonating a government officer, and copyright infringement.

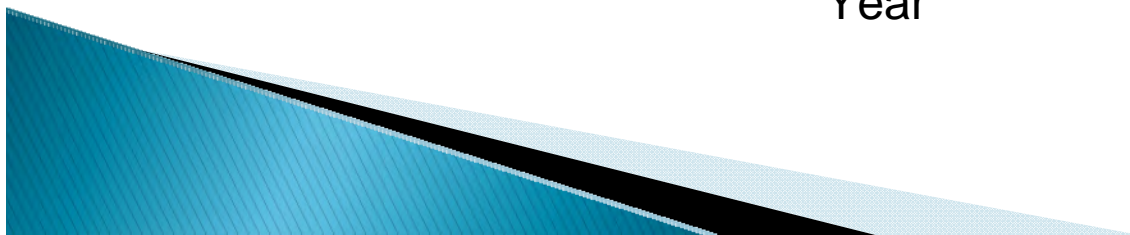
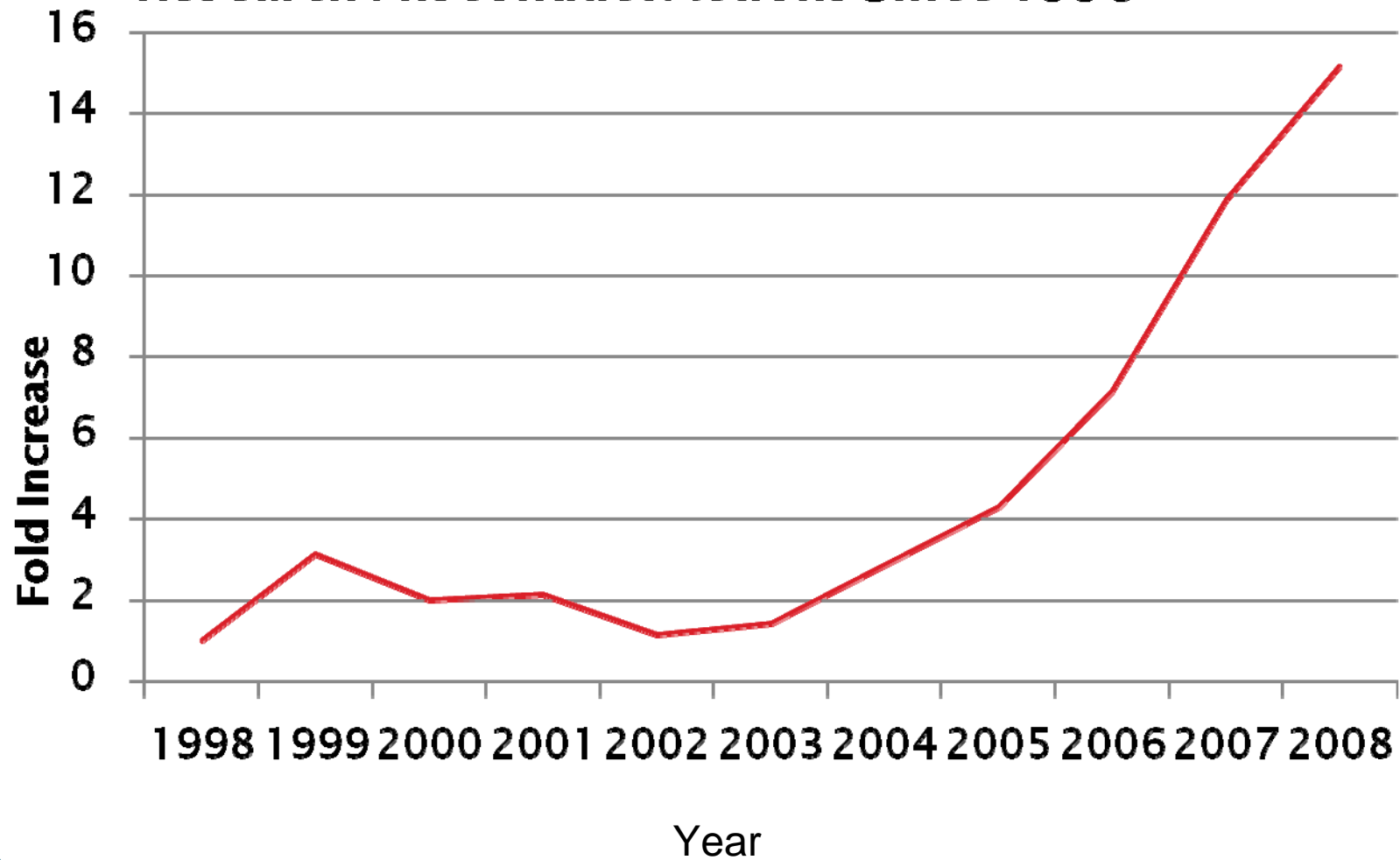
Grant money used for rent and tuition



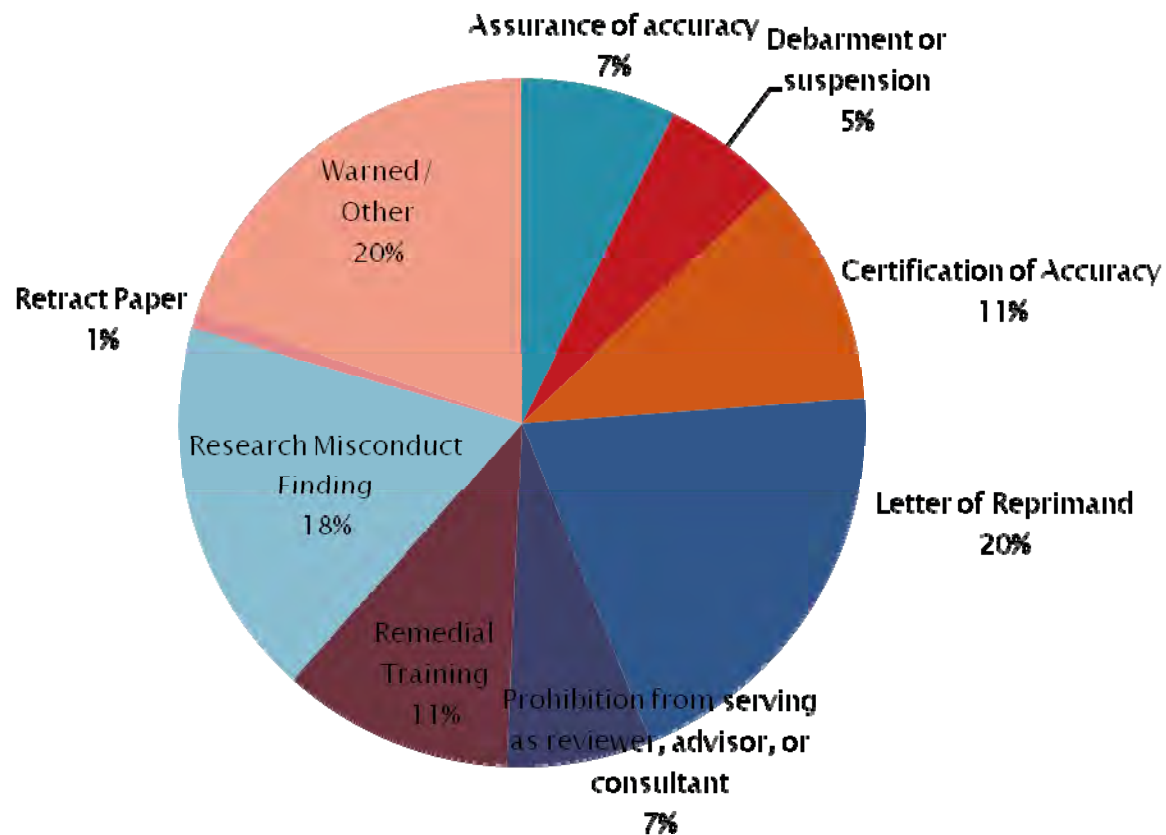
Individual fraud on an NSF Grant

- Fraudulent final report submitted to NSF by professor
- NSF grant money used for personal expenses
- NSF: Professor's grant was suspended and he had to repay almost \$200,000
- Criminal result: Professor pled guilty and was fined \$15,000 and faced 5-years probation

Research Misconduct Actions Since 1998



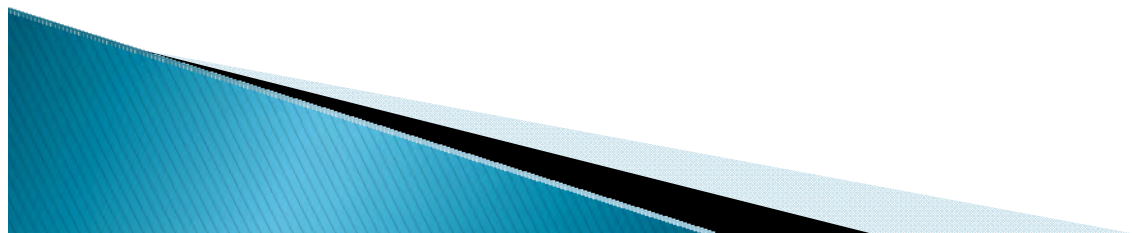
Research Misconduct Actions Since 1998



16 fold increase in remedial training (2003-2009)
Doubling in number of QRP letters sent (2006-2009)

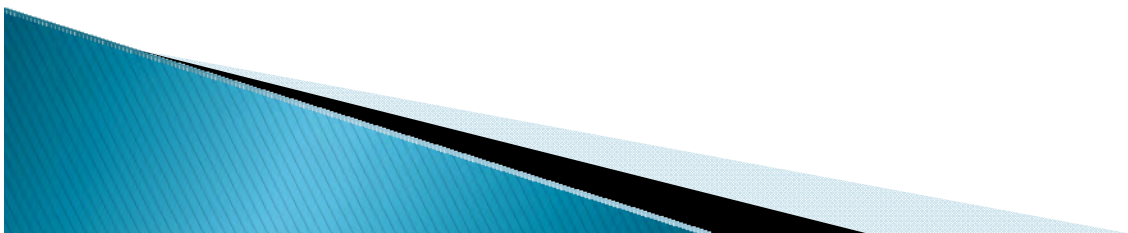
Questionable Practices

- ✓ Questionable Research Practice (QRPs)
 - ✓ meet the definition of SCIENTIFIC MISCONDUCT as an “other serious deviation.”
- ✓ Questionable Administrative Practice (QAPs)
 - ✓ fall outside the definition of RM, *e.g.*, violating NSF’s merit review, COIs (but not EEO allegations).
- ✓ Questionable Financial Practices (QFPs)
 - ✓ relate to either institutional or individual financial practices which are not civil or criminal but do need correcting
- ✓ Questionable Responsible Conduct of Research Practices (QRCRPs)
 - ✓ are a new category used after America COMPETES Act to designate those institutions that have questionable training practices



Consider some cases

- ▶ **Student fabricates data in 3 papers and one manuscript because uninterested in project**
 - Undetected for extended period of time.
 - 3 year debarment, certs, assurances, ethics training
- ▶ **Student fabricates “curb stoning” data presented in manuscript; lied to committee, mislead professor**
 - Undetected until thesis
 - 3 year debarment
- ▶ **Student fabricates data in Master’s thesis, claims in part not taught how to record data correctly**
 - Undetected until thesis submitted
 - 3 year debarment, certs, assurances
- ▶ **New Faculty member plagiarizes 4 pages and one figure into proposal**
 - no mentoring; Institution improves training
 - RM finding; certs, assurances, training
 -
- ▶ **Foreign trained student steals data, papers**
 - No mentoring: Institution improves training, rm investigation process
 - 5 year debarment
- ▶ **Faculty member plagiarizes 3 pages of a proposal he peer reviewed**
 - Incomplete investigation; Institution agrees to improve its investigation
 - 1 year debarment

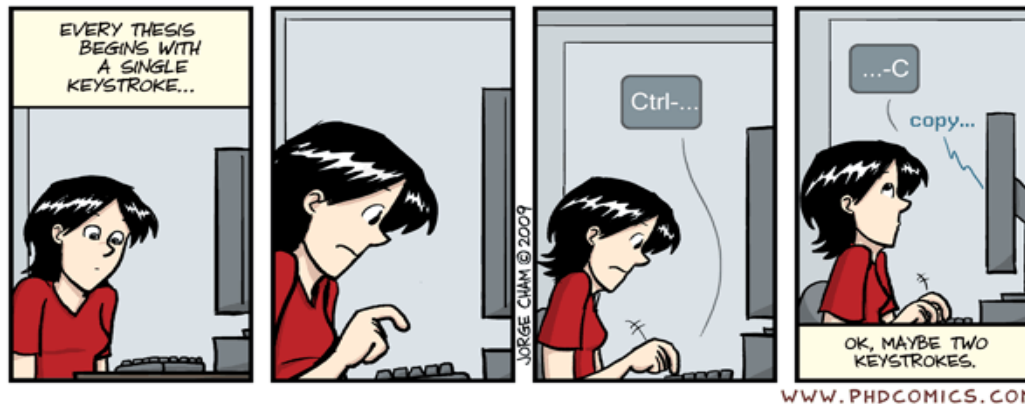


Hall of Excuses

- ▶ I didn't do it. My grad student wrote that section.
- ▶ It's only background. It has no technical merit.
- ▶ The reviewers are smart enough to know what is my work.
- ▶ It's not plagiarism; it's just bad citation/ in the public domain.
- ▶ I used the same words, but I meant something different.
- ▶ There's no other way to say that.
- ▶ I didn't have space for all the citations
- ▶ It's only a proposal. It's not like it's a publication"
- ▶ "FastLane removed all the quotation marks"
- ▶ "My English teacher told me it's not plagiarism if I change every 7th word."
- ▶ Anymore and I would look like I wasn't proposing to do something new."
- ▶ "If that was done by me, it was not intentional, and if I did it, I was not aware that I was doing it, and if I did it, it stopped."
- ▶ A bird distracted me.
- ▶ I was suffering from severe acid reflux.

Electronic technology and plagiarism

- Single to multiple sources
 - 1 proposal – 24 sources
 - 6 proposals and 56 sources
- Large blocks of text to individual sentences
- Evidence of a pattern in publications, theses, other proposals easier to find



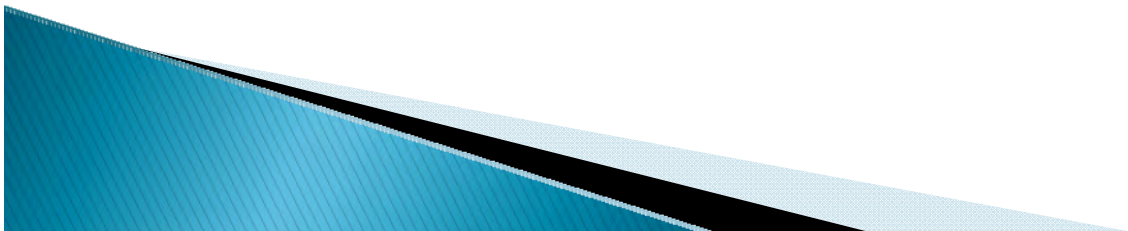
PhD Comics 4/10/2009

Distribution of RM Findings:

Fabrication	12%	Falsification	15%
Plagiarism	66%	Other	11%

Individual Consequences

- Reprimand
- Denial of tenure or termination
- Loss of salary
- Suspension or termination of awards
- Retraction of Papers
- Added review of published works, grant proposals
- Restrictions on numbers of students
- Ethics classes (attend or teach)
- Ban from serving as a reviewer
- Certifications by subject
- Assurances by supervisors or institution official
- Federal-wide debarment
- Civil, Criminal case and actions (probation, fines / restitution)
- Public disclosure of actions



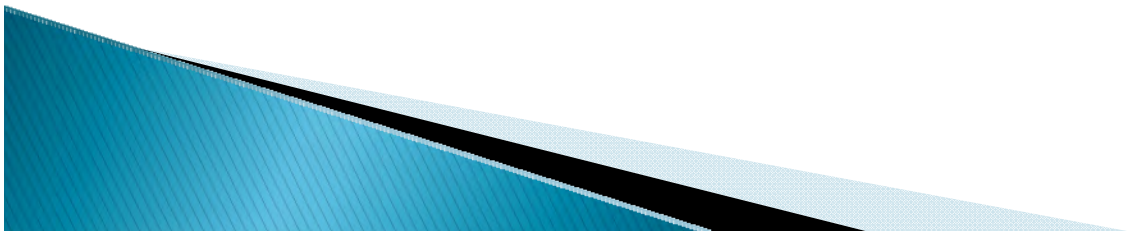
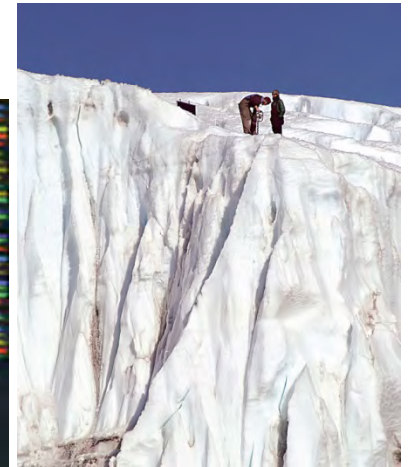
Research Integrity: a balance of training and investigating



A well-designed system guides your choices.

Responsible Professional Practices

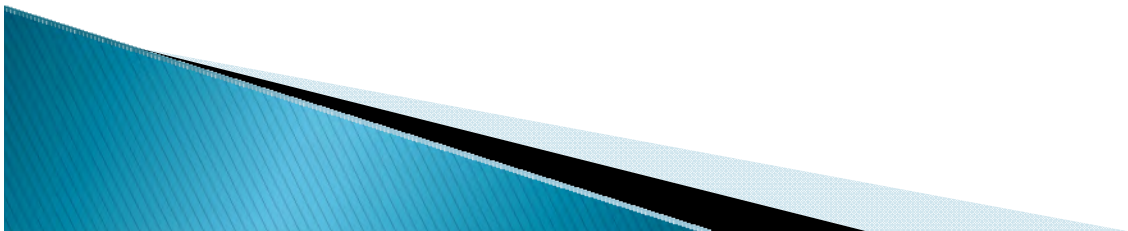
- ▶ Compliance with rules and regulations
- ▶ Peer Review Rules
- ▶ Mentor/ Trainee Responsibilities
- ▶ Human Subjects Regulations
- ▶ Animal Welfare Regulations
- ▶ Research Misconduct
 - Fabrication
 - Falsification
 - Plagiarism
- ▶ Collaborative Research Practices
- ▶ Publication/Authorship Practices
- ▶ Data Sharing/ Acquisition/Management/Ownership Practices
- ▶ Financial Management



And some more



- ▶ Conflict of Interest and Commitment
- ▶ Laboratory Management Skills (people/supplies)
- ▶ Grantsmanship
- ▶ Patent Issues
- ▶ Global Competence: contributing to knowledge, comprehension, analysis, and evaluation in the context of an increasingly globalized world
- ▶ Appropriate alternative actions provided by ethical principles and current professional guidelines
- ▶ Ethical reasoning
- ▶ Long term development of research agenda



Institutional Responsibilities (proposals submitted ON or AFTER January 4, 2010)

- ▶ a. An institution **must have a plan in place** to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students, and postdoctoral researchers **who will be supported by NSF** to conduct research. As noted in GPG Chapter II.C.1.e, **institutional certification to this effect is required for each proposal**.
- ▶ b. While **training plans** are not required to be included in proposals submitted to NSF, institutions are advised that they **are subject to review**, upon request.
- ▶ c. An institution **must designate one or more persons to oversee compliance** with the RCR training requirement.
- ▶ d. **Institutions are responsible for verifying** that undergraduate students, graduate students, and postdoctoral researchers supported by NSF to conduct research have received training in the responsible and ethical conduct of research.

Who must receive the RCR training?

- ▶ NSF expects institutions to . . . verify that . . . Students . . . who receive NSF funds (support from salary and/or stipends to conduct research on NSF grants) will obtain RCR training. However, NSF anticipates that institutions will develop their RCR training programs in a manner that helps prepare the next generation of researchers, **including the consideration of risks or other factors associated with student and postdoctoral researcher participation in research.**

Similar language in GPG II-C.1.e (NSF 10-01) Certification Regarding Responsible Conduct of Research (RCR)



Promoting Individual and Institutional Integrity

- 1) Establish standards and procedures
- 2) Designate someone to be responsible for the E&C Program
- 3) Care in assigning substantial discretionary authority
- 4) Effectively communicate and train on E&C Program elements
- 5) Establish monitoring and evaluation of E&C Program (risk evaluation)
- 6) Consistently promote and enforce E&C Program
- 7) Respond appropriately to problems

*Federal Sentencing Guidelines, OIG HHS (8 elements), COGR



What's in your plan?

What's the format?

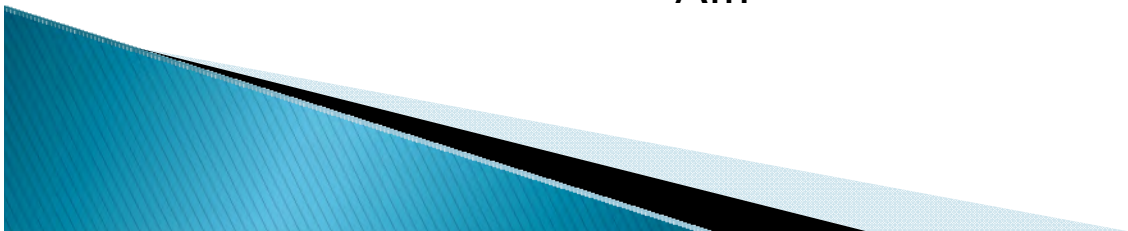
- On-line?
- Face-to-face meetings w/advisor?
- Faculty-led courses?

What's the subject matter?

- RM policies, authorship and citation practices, data acquisition and sharing*, animal/human subjects protection, IRBs, gov't requirements
- issues as determined by risk assessment
- real life scenarios:
<http://www.nsf.gov/oig/closeouts.jsp>

Who participates?

- Only students/postdocs directly funded by an NSF grant?
- Foreign-educated?
- All?



2 case studies

University A:

- Phased approach beginning with all students/postdocs on active NSF grants and 'high risk' students, broadening each year to eventually include all STEM students/postdocs regardless of support.
- Training included courses supplemented by on-line material.
- Univ's designated RCR person worked across campus for inclusiveness and had staff to assist.

University B: also compliant with NSF requirements: had more open cases than any university in OIG's history

- For RCR: Univ trained the two students supported by NSF.
- Univ assigned RCR duties to VPR (low priority).
- Training: any on-line course, academic course, or discuss w/advisor

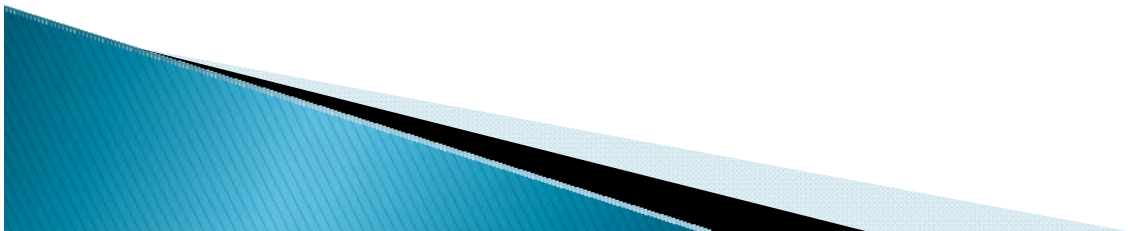


Conclusions

- We connect allegations to the training subjects received
 - Affects determination of intent;
 - **QRPs with** recommendations for required training if RM finding
 - Potential for **QRCRPs to Universities**
- A failure to train creates opportunities for RM
 - Should grants be reimbursed?
- Training information to be used in preparation for OIG RCR reviews.
 - **Planning to initiate reviews this year**

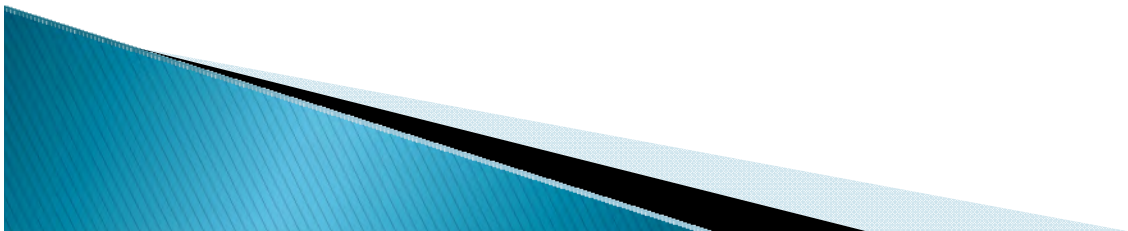
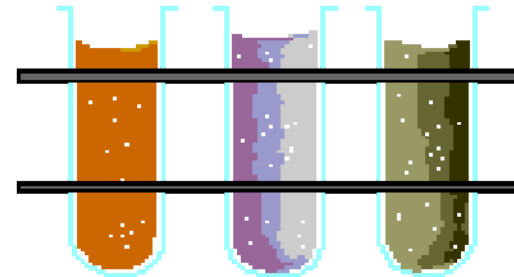
New Global Considerations

- ▶ For the U.S. to support international S&E partnerships, there must be accountability, research integrity, and minimal bureaucratic overhead from many sources. Common standards for research integrity among participants in international S&E partnerships must be created. . . (**National Science Board 08-4**)
- ▶ Global Science Forum (science policy group of government delegates under Organization for Economic Co-operation and Development - OECD)
 - Best Practices for Ensuring Scientific Integrity and Preventing Misconduct <http://www.oecd.org/dataoecd/37/17/40188303.pdf>
 - Co-ordinating Committee for Facilitating International Research Misconduct Investigations <http://www.oecd.org/dataoecd/29/4/42713295.pdf>



Research is Exciting

- ▶ Ethics Programs in your laboratory, your department and institution can:
 - create a safe environment of integrity for passion and inquiry to thrive
 - excite the next generation
 - allow us to adapt to the new challenges the science community faces



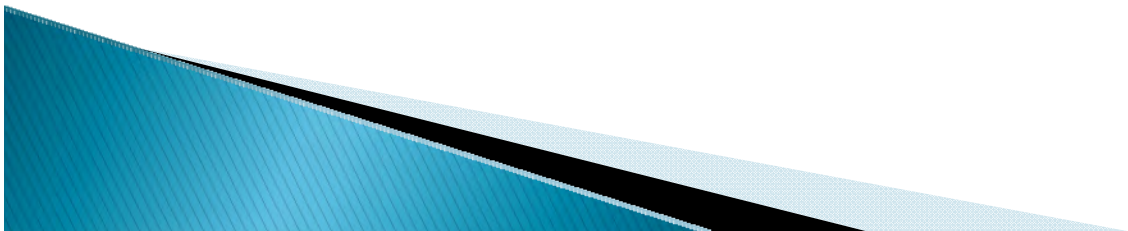
References

- ▶ <http://oig.hhs.gov/fraud/complianceguidance.html>
- ▶ <http://www.nacua.org/documents/FedSentencingGuidelines.pdf>
- ▶ <http://www.ussc.gov/corp/Murphy1.pdf>
- ▶ http://www.usdoj.gov/dag/cftf/corporate_guidelines.html
- ▶ http://ethicspoint.sitestream.com/Webinar%20fulfillment/VickyNemersonMarch2005/EthicsPoint_FSG%20Whitepaper-Feb05.pdf
- ▶ Grant, G. Odell, G., and Forrester, R; Creating Effective Research Compliance Programs in Academic Institutions; Academic Medicine, Vol 74, No. 9, September 1999, p. 951.
- ▶ Jordan, K.S.; and Murphy, J.E.; Compliance Programs: What the Government Really Wants. Page 121.
- ▶ A variety of University web sites
- ▶ Managing Externally funded Research Programs; A Guide to Effective Management Practices; Council on Government Relations, June 2005
- ▶ DHHS Draft OIG Compliance Program Guidance for Recipients of PHS Research Awards; Fed. Reg. Monday Nov 28, 2005, vol. 70#227, p:71312
- ▶ <http://www.bhef.com/BHEFEhtics5-31.pdf>
- ▶ <http://www.ussc.gov/corp/advgrprpt/advgrprpt.htm>

Contact Information



- ▶ Internet: <http://www.nsf.gov/oig/>
- ▶ E-mail: oig@nsf.gov
- ▶ Telephone: 703-292-4889 (Peggy)
- ▶ Anonymous: 1-800-428-2189
- ▶ Write: 4201 Wilson Blvd. Suite II-705
Arlington, VA 22230





Integrity: Metric of Research Success

Daniel A. Vallerio, Ph.D.
Pratt School of Engineering
Duke University

November 11, 2011

Research is more than just “science”.

“Science is a human activity inseparable from the societal atmosphere of its time and place. Scientists, therefore, are influenced - consciously or unconsciously - by the political needs and urgencies of their society.”

Anne Fausto-Sterling (*Myths of Gender: Biological Theories about Women and Men*).

Ethics Covers a Lot of Ground ...

- Reporting and investigating misconduct (fraud, plagiarism)
- Data management
- Authorship
- Collaboration and sharing data/resources
- Mentoring and teaching
- Publication
- Peer review
- Conflicts of interest
- Intellectual property (patents, copyrights)
- Compliance with laws and regulations
- Equality of opportunity and multiculturalism
- Human research
- Animal research
- Genetics/biotechnology
- Expert testimony
- Interactions with the media
- Public education
- Political advocacy
- Funding of research
- Censorship of research

Thanks to David Resnik, RCR Training, 2008.

New challenges for research...

- Even at the undergraduate level, engineers must:
 - Understand “the impact of engineering solutions in a global and societal context” (ABET, 2003) and
 - Recognize and address ethical questions involving institutional design, stakeholder relations, culture, and governance.

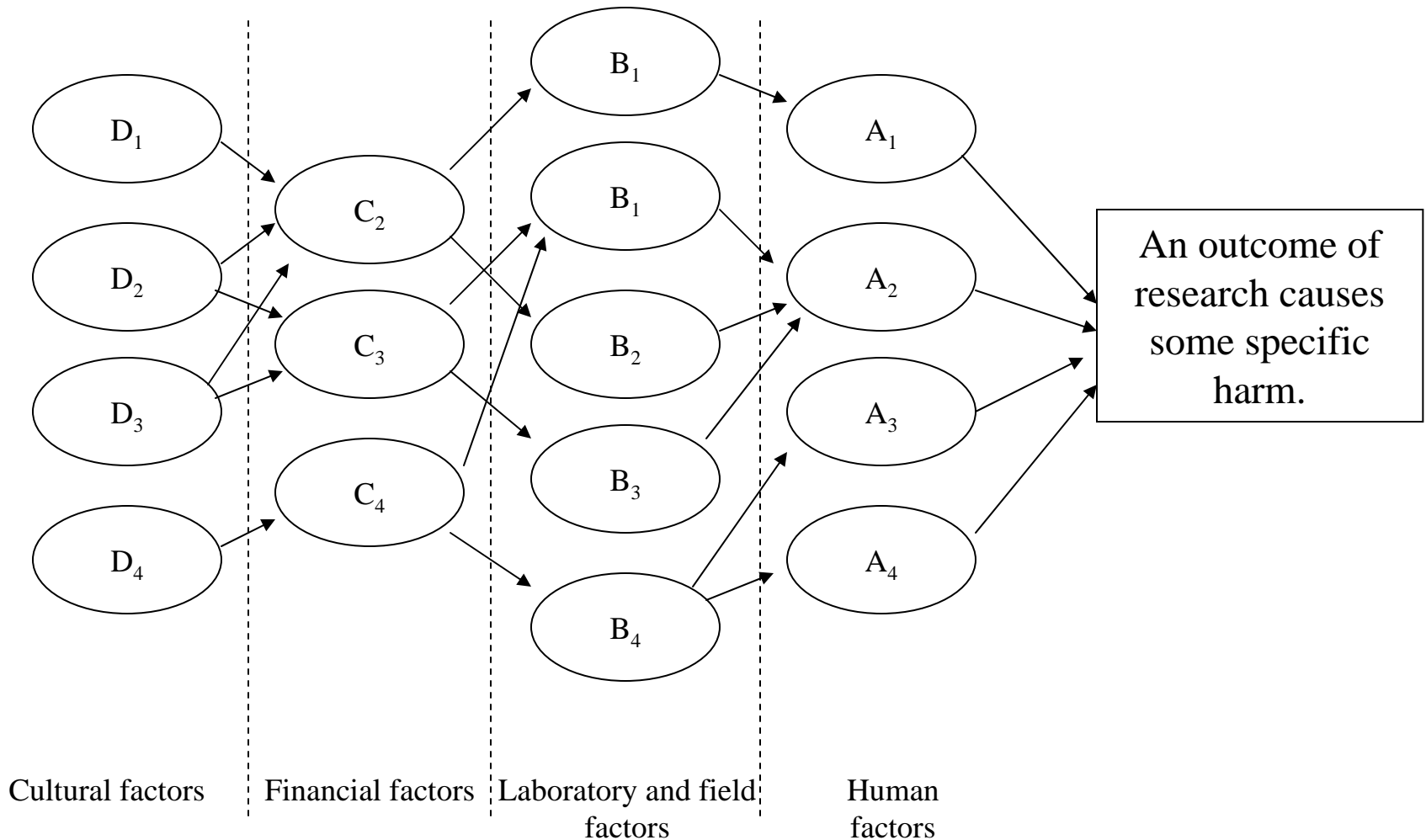
Emerging Ethos

- Honesty, integrity, fairness, and benevolence remain core ethical values
- Putting these values into practice requires sensitivity to how the undergraduate faces ethical challenges
- Beyond risk/benefit (utility)...
- Must consider justice, respect for persons, beneficence....

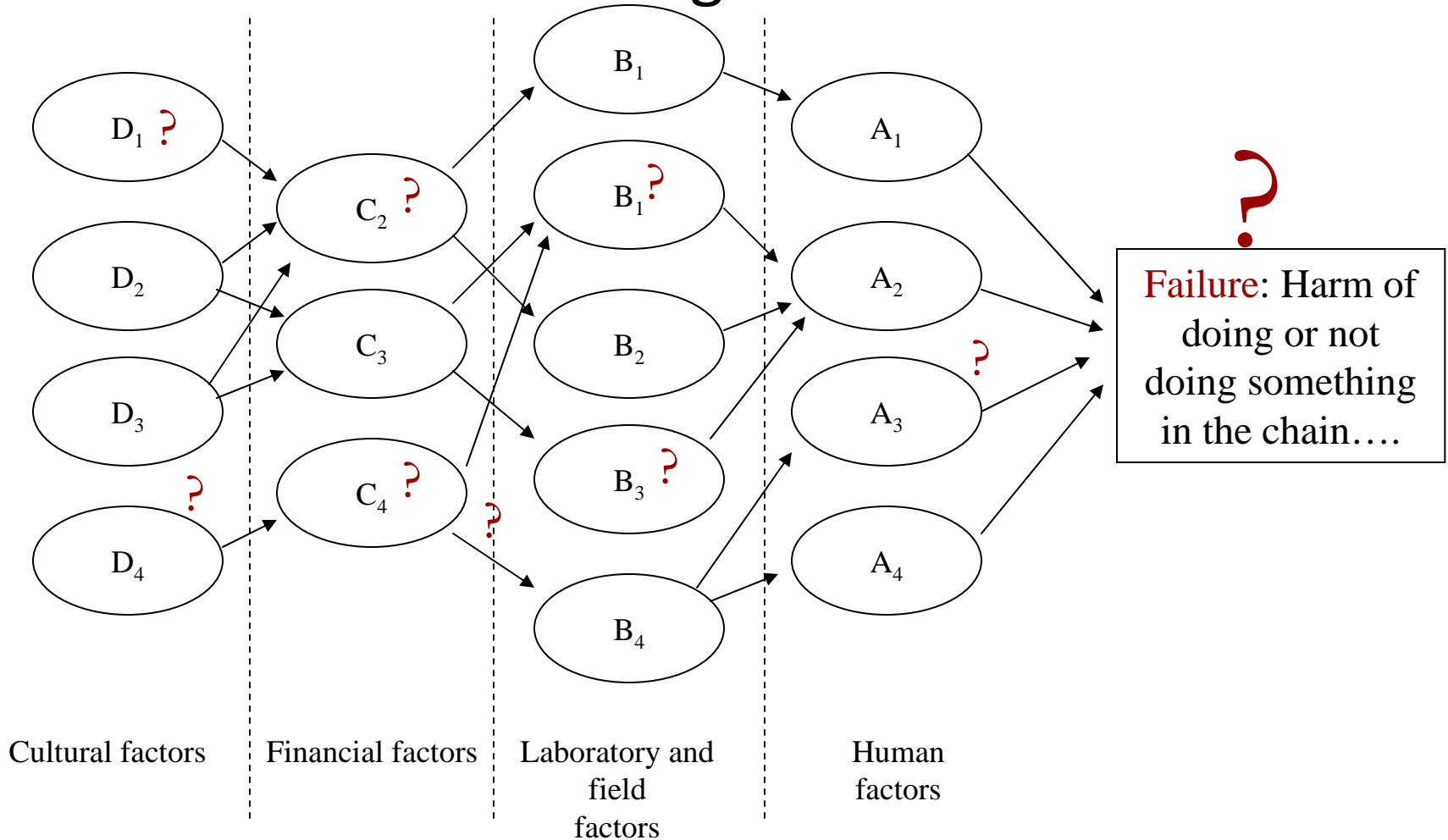
Research Ethics as Chaos

- Unintended consequences....
 - Spaceship earth, Malthusian curves....
 - Andromeda Strain and “Gray Goo” ...
- Uncertainties in time and space
 - Advocacy science
 - Junk science
 - Truth as a casualty
- Risk
 - as projected in natural versus engineered futures

Bayesian Belief Network



But this assumes we are honest about the science underpinning the ellipses and what which arrows go where



NSPE Fundamental Canons

1. Hold paramount the safety, health and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

Engineering Ethics is an Affirmative Process

- “The unexamined life is not worth living.”
Socrates
- “The happy life is thought to be virtuous; now a virtuous life requires exertion, and does not consist of amusement.”
Aristotle

Integrity is modeled

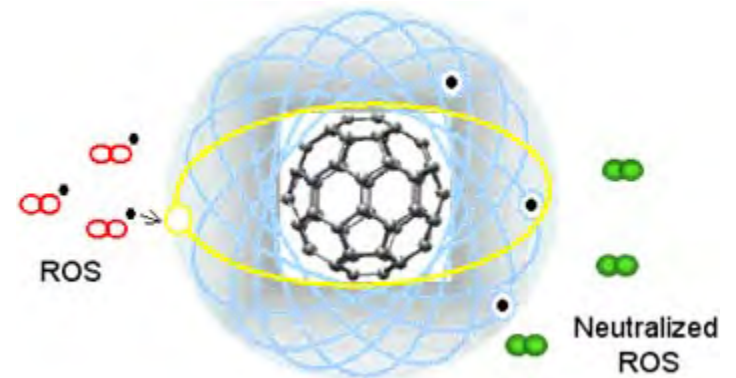
- Emerging technologies are so esoteric in content that we are even more dependent on individual integrity
- Ethical behavior can be taught and learned
- Moral development is a process, ala Kohlberg's six stages

Two Roles*

- **Microethics** – ethical choices and dilemmas faced by individual researchers/practitioners, especially as they relate to acting in accordance with professional codes and norms
- **Macroethics** – ethical issues of research and practice in larger social and institutional contexts, including broader social responsibilities of engineers, policy and political questions and debates, questions about what the rules and norms should be, and who is involved in debates

Measures of Success

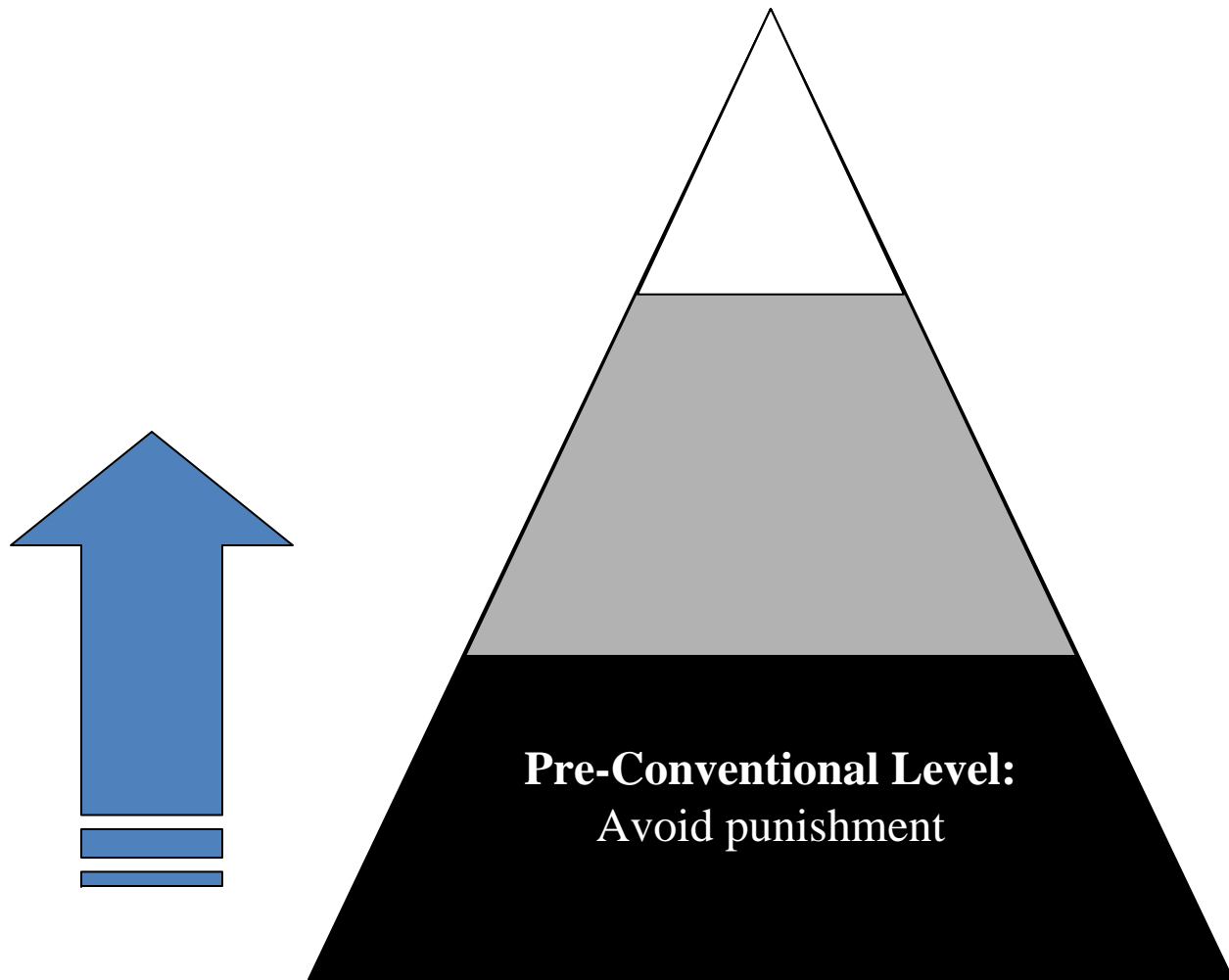
1. Awareness
2. Decision Making
3. Behavior
 - Long-term investment



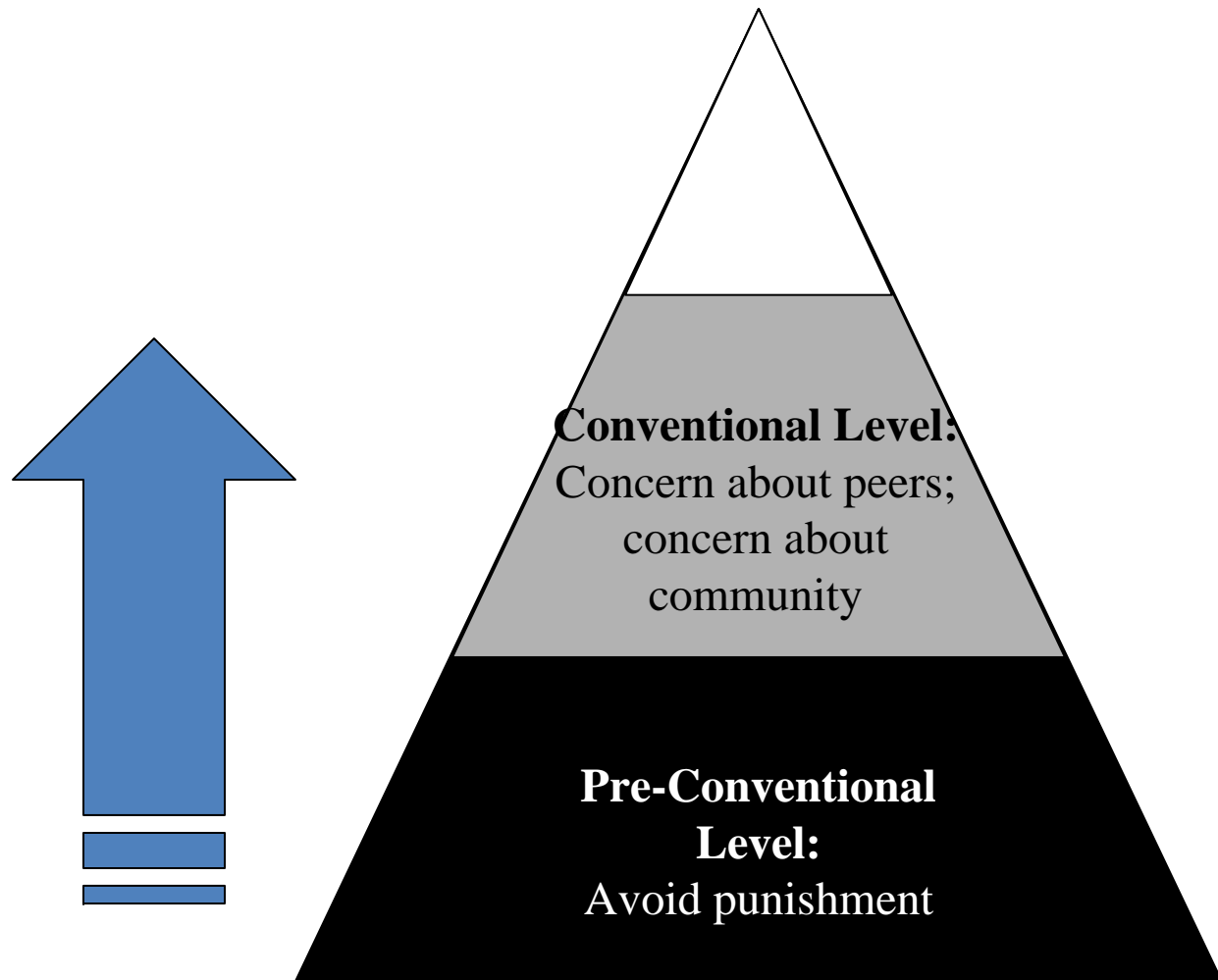
Linking Research Ethics with Professional Ethics

- Can be likened to Kohlberg's Theory of Moral Development

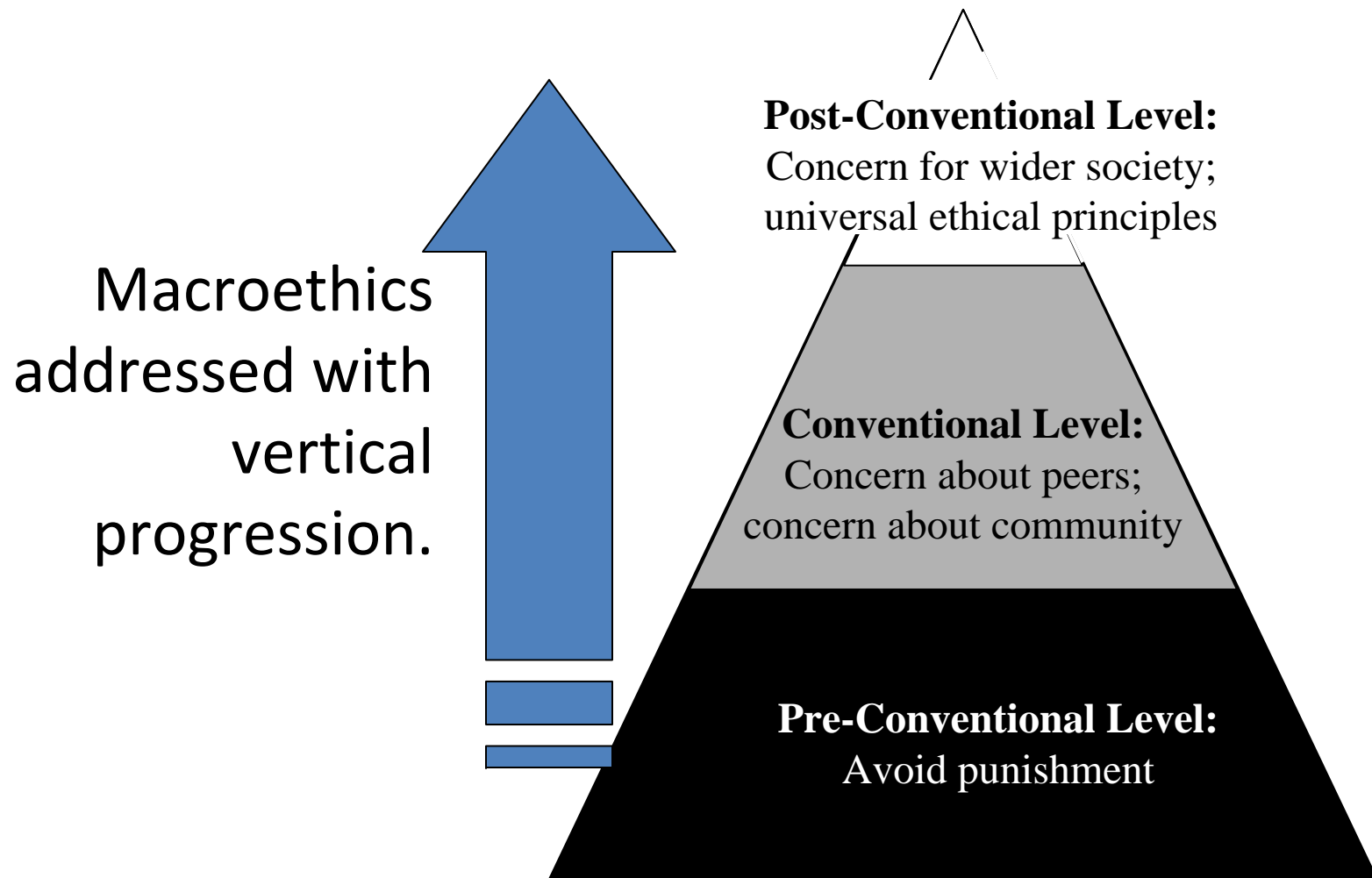
KOHLBERG'S THEORY OF MORAL DEVELOPMENT



KOHLBERG'S THEORY OF MORAL DEVELOPMENT



KOHLBERG'S THEORY OF MORAL DEVELOPMENT



Linking Research Ethics with Professional Ethics

- Can be likened to Kohlberg's Theory of Moral Development
- The resultant model from this project will form the basis for departmental, center and other more targeted ethical challenges stemming from research in emerging technologies.

The Engineer's View

KOHLBERG'S THEORY OF MORAL DEVELOPMENT

ENGINEERING RESEARCH MODEL

Post-Conventional Level:
Concern for wider society;
universal ethical principles

Conventional Level:
Concern about peers;
concern about
community

**Pre-Conventional
Level:**
Avoid punishment

**Legal, Career,
Reputation :**
Oriented toward
staying out of trouble,
gaining knowledge,
making money

Students, Future
Engineers (FE)
Engineers in Training
(EIT), Designers

The Engineer's View

KOHLBERG'S THEORY OF MORAL DEVELOPMENT

ENGINEERING RESEARCH MODEL

Post-Conventional Level:
Concern for wider society;
universal ethical principles

Conventional Level:
Concern about peers;
concern about
community

**Pre-Conventional
Level:**
Avoid punishment

Leader and Expert:
Oriented toward leading
customers,
suppliers, employees, and
engineering profession

**Legal, Career,
Reputation :**
Oriented toward
staying out of trouble,
gaining knowledge,
making money

Partners, Full
Members of Societies,
Mentors, Professional
Engineers (PE)

Students, Future
Engineers (FE)
Engineers in Training
(EIT), Designers

The Engineer's View

KOHLBERG'S THEORY OF MORAL DEVELOPMENT

TECHNOLOGIST'S ETHICAL MODEL

Post-Conventional Level:
Concern for wider society;
universal ethical principles

Engineering Exemplar:
Oriented toward wisdom,
being a role model and
setting tone for future
generations of engineers

Conventional Level:
Concern about peers;
concern about
community

Leader and Expert:
Oriented toward leading
customers,
suppliers, employees, and
engineering profession

**Pre-Conventional
Level:**
Avoid punishment

**Legal, Career,
Reputation :**
Oriented toward
staying out of trouble,
gaining knowledge,
making money

Examples:

Sages, Founding
Members, Members of
the Academy

Partners, Full
Members of Societies,
Mentors, Professional
Engineers (PE)

Students, Future
Engineers (FE)
Engineers in Training
(EIT), Designers

Some interesting things we heard during our macroethics study at Duke

- "The ethical issues surrounding the emerging nanotechnology revolution **cannot be left entirely up to society to decide**, where the competing values of the whole and those of the elite few, who possess the power to direct the goals and intentions of technological innovations, may be at odds."

Science and the Public Good

“... the immediate ethical responsibility **lies with the scientists** who are proposing and carrying out the research that will deliver the nanotechnology revolution.”

Science and the Public Good

"Public perception of science and technology is mixed, based largely on a history of inspiring successes and devastating failures. At one extreme are the **skeptics** who focus on the **risks** of technological advances and who demand a halt to all progress until the absence of risk can be assured. Their polar opposites are the **proponents** of technology who, with almost **blind optimism**, extol the benefits of progress and downplay the risks as necessary. Both groups, in their extremism, hamper the development of technology."

Conduct of Cutting-Edge Research

"Applications of medical nanoscience put at risk the very population they are used to aid. The ethical challenges of nanotherapeutics lie in assessing the health **risks**, determining a reasonable screening strategy for complications, and providing timely and accessible medical **care** to rectify or alleviate health problems induced by the nanotherapy."

Conduct of Nanoscience Research

"Good research practices are imperative to the success of nanotechnology. **Placing restrictions on the researcher only inhibits the abilities of growth.** However, it is the responsibility of the researcher to conduct research in an ethical matter, taking into account the positive and negative effects of nanotechnology. These responsibilities include continual training of the ethics of nanotechnology and its effects on the world."

Prescriptions

"Perhaps as a result of this **disjointed collection of viewpoints**, scientists are carefully discussing those issues which are expected to affect the rightness of research into and subsequent applications within the field of nanoscience. Foremost among these considerations are the financial **cost, health risks, and potential abuses of nanoscience.**"

Ethical Artifacts

"Sadly, the possibilities for abuse of nanoscience knowledge, however well-intentioned, are only constrained by the limits of human **imagination**. Given the risk of misuse, scientists must carefully evaluate and strive to **anticipate** the ramifications of each study. Simultaneously, society must prepare a **control framework** to limit the accessibility of high-risk nanotherapies to those who would use them ethically."

Bottom Line

"Nature has given us the template for nanotechnology; it is ultimately **human responsibility** to use this technology in an ethical way for the **benefit** of our ... world."

Conversations

- Science has primacy
- Don't set up dilemmas
 - We are agents, not judges
 - Balance and honesty (especially with oneself)

What to do?

- There are lots of resources to support ethical decision making.
- Good science and engineering is ethical science and engineering.
- Truth: The scientific method
- Snow: The truth must be told at all times in science (beware of rationalizations!)....



Contact me

- dav1@duke.edu
- 919-541-3306



Peer Review Ethics: A Tale of Two Mindsets

Presented by: Stephen D. Rappaport, Co-director, Questioning Institute

Presented to: Sigma Xi, 2011 Annual Meeting, Ethics Symposium, November 12, 2011

Authors: Stephen D. Rappaport, QI; Janna Kamanskaia, Queens College; Howard Moskowitz, QI

Background

- ❑ Sigma Xi 2011 theme: "Year of Ethics"
- ❑ Asked Dr. Moskowitz, 2010 Chubb Award Winner, to explore peer review ethics using the science of mind genomics



Mind Genomics in Brief

- Goal: understand everyday experience through science to understand how perceptions organize our lives, how our values drive responses, and how people differ from each other

- Individuals hold mindsets towards every entity
- Every entity usually has two or more mindsets associated with it
- Mindsets are discoverable through experimentation
- Understanding the different mindsets provides us with the ability to take actions based on them

Mind Genomics in Brief (Cont'd)

- Experiments utilize a set of elements, presented in groups (vignettes), and fully randomized
 - Vignettes evoke a mental picture that respondents rate
- Respondents rate the vignettes on two scales: ethics and emotion
- Later asked classification questions, e.g. demographics
- Analytic routines:
 - transform scalar values to binary (ethical, not-ethical)
 - the impact value of each element,
 - the emotion linked with each element,
 - a segmentation that reveals the mindsets
 - a segmentation wizard that assigns people to mindsets

STUDY POPULATION: SIGMA Xi Members



DEVELOPED ELEMENTS FOR VIGNETTES



Recruited by Dr. Crosby
August 29 – Sept 5, 2011
368 completes



Sigma Xi members



ANALYZED DATA

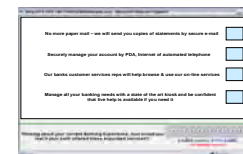
MINDSETS

	1	2	3	4	5
1. I am a person who is always looking for ways to improve myself.					
2. I am a person who is always looking for ways to improve my work.					
3. I am a person who is always looking for ways to improve my life.					
4. I am a person who is always looking for ways to improve my relationships.					
5. I am a person who is always looking for ways to improve my health.					
6. I am a person who is always looking for ways to improve my finances.					
7. I am a person who is always looking for ways to improve my education.					
8. I am a person who is always looking for ways to improve my skills.					
9. I am a person who is always looking for ways to improve my knowledge.					
10. I am a person who is always looking for ways to improve my character.					

INTERESTS/EMOTIONS



SEGMENTATION WIZARD



Elements for the Vignettes

Category1: Ethics of Authorship It's ok to add authors ... helps careers Data presented has integrity and is replicable Some authors review the final manuscript Key concepts are fully cited Authors submit papers in their discipline only Authors explain potential or real conflicts of interest	Category4: Ethics Of Acceptance For Review Conflicts of interest between authors and referees are identified and avoided Popular theories and methods are "pushed" Research sophistication is used as a quality indicator "Friends" receive publishing preference Published articles serve interests of readers, not author's Positive results are preferred for publication
Category2: Ethics of the Story Presentation Authors "play up" findings to be accepted in a higher impact journal Experimental method is clearly stated It's ok to throw away a single data point unrelated to the conclusion Figures are altered to lead reader to the right conclusion Ideas or methods are copied from a published manuscript without reference Readers are expected to determine conflicts of interest or bias	Category5: Stability Vs Advance Of Knowledge Papers are rejected when data conflicts with earlier journal research New discoveries are published even when they do not clearly link to existing knowledge Referees reject findings that contradict their beliefs Errors in influential published papers are widely publicized Controversies are featured to encourage research and debate Replication studies are important and given regular space
Category3: Ethics Concerning Referees The journal uses double-blind review Referees are qualified to judge a manuscript's content Naming referees and authors promotes ethical behavior Referees subcontract the "dirty work" to assistants A formal appeals process resolves disputes Referees respect and safeguard author's intellectual property	Category6: Ethics Of The Managing Editor/Journal Editors provide objective oversight Editors point out review flaws and share them with referees Referee appointment process is transparent Editors suggest alternative journals for rejected manuscripts Review norms and guidelines are explicit Referees are selected for their bias towards a manuscript's content

Peer Review Study

Rating Questions

1. How ethical is this journal?

Not at all ethical 9. Completely ethical

2. How does the ethical position of this journal make you feel Right Now?\

1. Anxious 2. Skeptical 3. Neutral 4. Satisfied 5. Trusting

Respondent Orientation

Welcome to Sigma Xi's study on the ethics of journal peer review.

The interview you are about to take is part of Sigma Xi's "Year of Ethics" initiative. It will present you with a series of screens, each one describing journal practices with three or four phrases. We call these vignettes. Although the vignettes may appear similar, each one is different. The ones you see will be different from the ones other interviewees see.

After each vignette appears, you will rate each one on three questions: 1. How ethical is this journal? 1. Not at all ethical · 9=Completely ethical 2. How does the ethical position of this journal make you feel Right Now? 1=Anxious 2=Skeptical 3=Neutral 4=Satisfied 5=Trusting

Completing the interview should take about 15 minutes. A progress indicator appears at the top right of the screen. Results will be made available by Sigma Xi.

Click on the >> button to start.



Stimulus: 48 Vignettes First Rated for Ethical Level

1/73

Some authors review the final manuscript

Naming referees and authors promotes ethical behavior

Controversies are featured to encourage research and debate

Editors suggest alternative journals for rejected manuscripts

How ethical is this journal?

1 2 3 4 5 6 7 8 9

1=Not at all Ethical ... 9=Completely Ethical

Done

Vignette then Rated for a Single Emotion

1/73

Some authors review the final manuscript

Naming referees and authors promotes ethical behavior

Controversies are featured to encourage research and debate

Editors suggest alternative journals for rejected manuscripts

How does the ethical position of this journal make you feel Right Now?

1 2 3 4 5

1=Anxious 2=Skeptical 3=Neutral 4=Satisfied
5=Trusting

Done

Internet

170%

1. Scientists expect journals to be ethical. Know what promotes/detracts.

1. How ethical is this journal? 1=Not at all Ethical ... 9=Completely Ethical Sorted by Total Sample : Highlighted >+9 winners & <-9 losers		Sorted by Total Sample
	Base Size	368
	CONSTANT:	40

2. Emotions Correlate with Ethical Practices

How do you feel when you read these messages?	Anxious	Skeptical	Neutral	Satisfied	Trusting
Anxious					
Ideas or methods are copied from a published manuscript without reference	29	23	(7)	(10)	(9)
Referees reject findings that contradict their beliefs	28	16	(9)	(7)	(3)
Figures are altered to lead reader to the right conclusion	25	21	(1)	(10)	(7)
Skeptical					
Ideas or methods are copied from a published manuscript without reference	29	23	(7)	(10)	(9)
Papers are rejected when data conflicts with earlier journal research	18	23	(3)	(8)	(4)
Figures are altered to lead reader to the right conclusion	25	21	(1)	(10)	(7)
Neutral					
Positive results are preferred for publication	9	8	12	2	(4)
Authors "play up" findings to be accepted in a higher impact journal	7	16	12	(1)	(7)
Research sophistication is used as a quality indicator	4	2	12	8	1
Satisfied					
Key concepts are fully cited	(2)	3	6	11	9
Editors point out review flaws and share them with referees	(2)	8	4	11	5
Controversies are featured to encourage research and debate	1	4	4	11	5
Trusting					
Experimental method is clearly stated	(2)	4	3	10	11
Data presented has integrity and is replicable	(6)	7	8	8	11
Conflicts of interest between authors and referees are identified and avoided	1	0	9	6	9

Questioning Institute: Sigma Xi Annual Meeting, November 12, 2011

Different Scientists ... Different Mindsets?



Questioning Institute: Sigma Xi Annual Meeting, November 12, 2011

3. 2 Different Mindsets

Scientific Advance, Procedural

1. How ethical is this journal? 1=Not at all Ethical ... 9=Completely Ethical Sorted by Total Sample : Highlighted >+9 winners & <-9 losers	Sorted by Total Sample	Seg1 of 2 Scientific Advance	Seg2 of 2 Procedure
Base Size	368	194	174
CONSTANT:	40	37	42
Key concepts are fully cited	11	11	11
Experimental method is clearly stated	10	6	14
Data presented has integrity and is replicable	10	12	7
Replication studies are important and given regular space	9	14	3
A formal process exists to resolve disputes	9	14	4
The "Seems there is always those	8	11	5
Ref that want to go forward at the	8	6	10
Ref cost of convention and those	7	8	6
Err that would rather stick to	7	14	-1
It's between the lines."	-10	-8	-13
Pos	-11	-11	-12
Ref	-15	-12	-18
Ree	-15	-21	-9
Aut	-17	-22	-11
It's -- Prof. T. Calquhoun, U. Florida	-17	-29	-3
Popular theories and methods are "pushed"	-20	-13	-28
Referees are selected for their bias towards a manuscript's content	-21	-22	-20
Papers are rejected when data conflicts with earlier journal research	-21	-13	-30
Referees reject findings that contradict their beliefs	-22	-12	-33
Friends receive publishing preference	-28	-25	-32
Figures are altered to lead reader to the right conclusion	-29	-35	-23
Ideas or methods are copied from a published manuscript without reference	-31	-37	-25

Each mindset has the same proclivity to consider a journal "ethical," BUT... emphasize elements differently

Mindset Highlights

Procedure	
<p>Most Positive</p> <ul style="list-style-type: none">• Experimental method is clearly stated• Key concepts are fully cited• Published articles serve interests of readers, not author's• Referee appointment process is transparent	<p>Concern with reporting and editorial process</p>
<p>Most Negative</p> <ul style="list-style-type: none">• Popular theories and methods are "pushed"• Papers are rejected when data conflicts with earlier journal research• Friends receive publishing preference• Referees reject findings that contradict their beliefs	

Replication, Error Correction, Discoveries

Scientific Advance	
<p>Most Positive</p> <ul style="list-style-type: none">• Errors in influential published papers are widely publicized• Replication studies are important and given regular space• A formal appeals process resolves disputes• New discoveries are published even when they do not clearly link to knowledge	
<p>Most Negative</p> <ul style="list-style-type: none">• Friends receive publishing preference• It's ok to throw away a single data point unrelated to the conclusion• Figures are altered to lead reader to the right conclusion• Ideas or methods are copied from a published manuscript without re	

Mindset Highlights

Procedure

Reporting, Editorial Process

Most Positive

- ❑ Exp'l method clearly stated
- ❑ Key concepts fully cited
- ❑ Published articles serve reader interests
- ❑ Referee appt. process is transparent

Most Negative

- ❑ Popular theories/methods pushed
- ❑ Non-conforming results rejected
- ❑ Friends receive preference
- ❑ Referees reject findings that contradict their beliefs

Scientific Advance

Replication, Error Correction, Discoveries

Most Positive

- ❑ Errors widely publicized
- ❑ Replications given regular space
- ❑ Formal appeals process resolves disputes
- ❑ New discoveries published

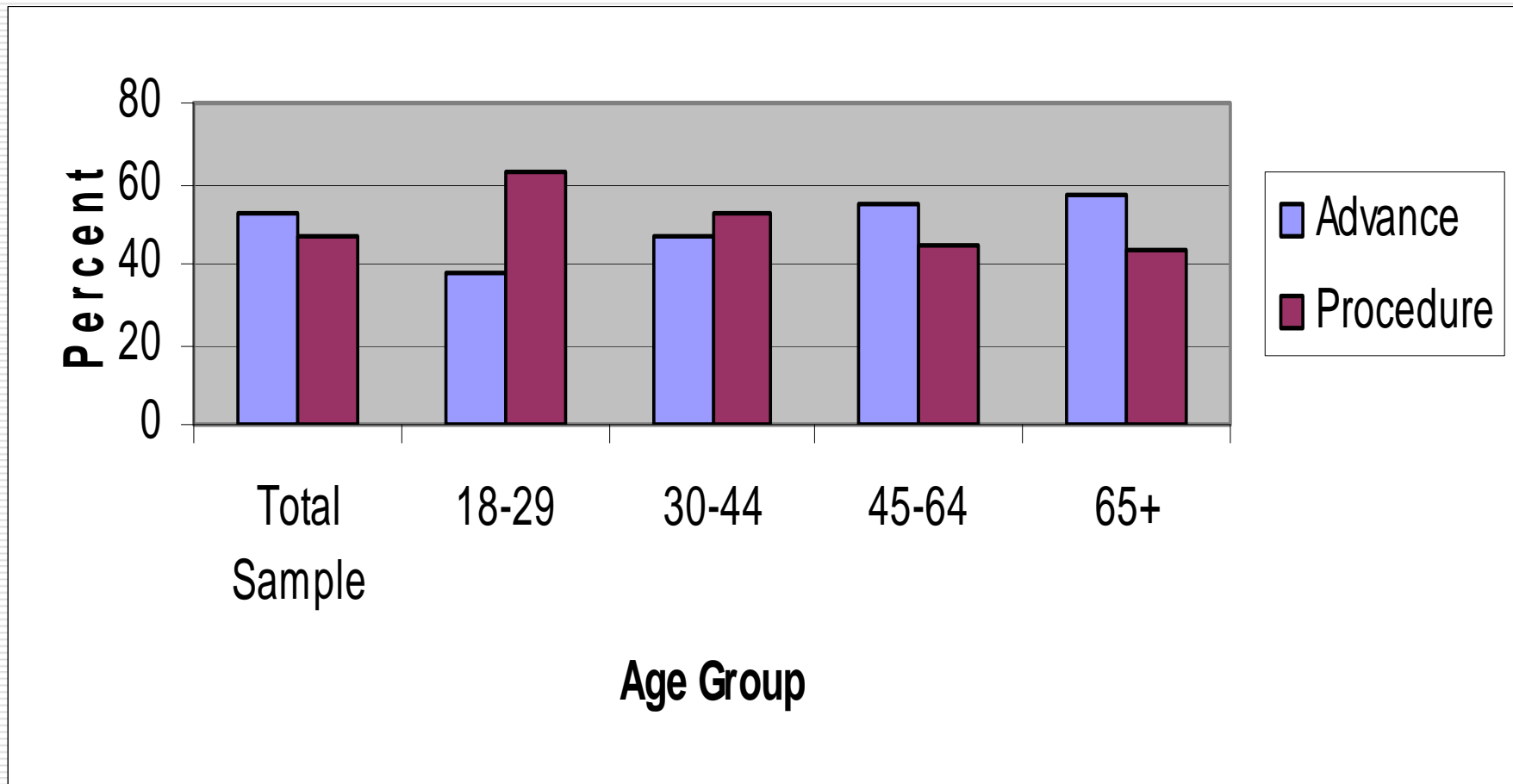
Most Negative

- ❑ Friends receive preference
- ❑ Throw single data points away
- ❑ Alter figures
- ❑ Copying without citation

5. As Careers Evolve ... Ethical Interests Shift

18-29 <u>Fair Shake</u>	30-44 <u>Build Career</u>	45-64 <u>Cement Authority</u>	65+ <u>Integrity</u>
Objective oversight	Concepts fully cited	Exp'l method clear.	Data with integrity and replicable
Replication studies	Reader interest	Int'l property safeguards	Formal appeals and dispute resolution
Transparent referee appointment	Alternatives for rejects	Concepts fully cited	
Qualified referees	Transparent referee appointment		

4. Mindsets Shift as Scientists Mature



Mindsets are Easily Typed

A “Scratch Test”

<http://mjiweb.com/mjitt/PeerReview/index.htm>

3 Questions (determined by Discriminant Function Analysis)

Identifies mindset of individual

Specifies positive and negative elements that appeal or “turn off”

Mindset Typing

A "Scratch Test"

<http://mjiweb.com/mjitt/PeerReview/index.htm>

How ethical is a journal where authors "play up" findings to be accepted in a higher impact journal?

Not At All Some What Very Much

How ethical is a journal where editors provide objective oversight?

Not At All Some What Very Much

How ethical is a journal where referees reject findings that contradict their beliefs?

Not At All Some What Very Much

Questions Raised by Mindsets for Scientific Publishing

- Is one of the mindsets “better” for science?
- Should submission guidelines be tailored to each mindset?
- Should journals determine and match the mindsets and ages of editors, reviewers and authors to ensure fairness and opportunity?
- Are young scientists and engineers led to demonstrate “correctness” over researching interesting questions?
- What other scientific concerns would benefit from knowing mindsets?

Further Research

- ❑ Scientists mindsets toward dealing with ethical lapses and breaches
- ❑ Public's mindsets towards scientific ethics

Thank You!

- For further information about this study:
 - Stephen D. Rappaport, Howard R. Moskowitz
 - Email:
 - srappaport@questioninginstitute.com
 - hmoskowitz@questioninginstitute.com
 - Data available at: www.questioninginstitute.com, click on "ethics"
 - Full study report will be available at: www.questioninginstitute.com and through Sigma Xi publications

Appendix

Publication Procedure: Concern with reporting and editorial process

1. How ethical is this journal? 1=Not at all Ethical ... 9=Completely Ethical Sorted by Total Sample : Highlighted >+9 winners & <-9 losers	Seg2 of 2 Procedure
Base Size	174
CONSTANT:	42
Experimental method is clearly stated	14
Key concepts are fully cited	11
Published articles serve interests of readers, not author's	10
Referee appointment process is transparent	10
Editors provide objective oversight	9
Data presented has integrity and is replicable	7
Editors point out review flaws and share them with referees	7
Referees respect and safeguard author's intellectual property	6
Review norms and guidelines are explicit	6
Conflicts of interest between authors and referees are identified and avoided	6
Authors "play up" findings to be accepted in a higher impact journal	-11
Positive results are preferred for publication	-12
It's ok to add authors ... helps careers	-13
Referees subcontract the "dirty work" to assistants	-18
Referees are selected for their bias towards a manuscript's content	-20
Figures are altered to lead reader to the right conclusion	-23
Ideas or methods are copied from a published manuscript without reference	-25
Popular theories and methods are "pushed"	-28
Papers are rejected when data conflicts with earlier journal research	-30
Friends receive publishing preference	-32
Referees reject findings that contradict their beliefs	-33

Scientific Advance: Replication, Error Correction, Discoveries, Integrity

1. How ethical is this journal? 1=Not at all Ethical ... 9=Completely Ethical Sorted by Total Sample : Highlighted >+9 winners & <-9 losers	Seg1 of 2 Scientific Advance
Base Size	194
CONSTANT:	37
Replication studies are important and given regular space	14
Errors in influential published papers are widely publicized	14
A formal appeals process resolves disputes	14
New discoveries are published even when they do not clearly link to existing knowledge	13
Data presented has integrity and is replicable	12
Key concepts are fully cited	11
The journal uses double-blind review	11
Controversies are featured to encourage research and debate	10
It's ok to add authors ... helps careers	-8
Positive results are preferred for publication	-11
Referees reject findings that contradict their beliefs	-12
Referees subcontract the "dirty work" to assistants	-12
Papers are rejected when data conflicts with earlier journal research	-13
Popular theories and methods are "pushed"	-13
Readers are expected to determine conflicts of interest or bias	-21
Referees are selected for their bias towards a manuscript's content	-22
Authors "play up" findings to be accepted in a higher impact journal	-22
Friends receive publishing preference	-25
It's ok to throw away a single data point unrelated to the conclusion	-29
Figures are altered to lead reader to the right conclusion	-35
Ideas or methods are copied from a published manuscript without reference	-37

Definitions

- Additive Constant (segmentation)
 - The probability that a respondent will assign the concept “ethical journal” without any elements
- Impact Value (elements)
 - The conditional probability of people switching from calling a journal “non-ethical” to calling a journal “ethical” when that element is present in a vignette
- Strength of Linkage (for emotions)
 - When a specific element appears in a vignette, the probability that the entire vignette is assigned a specific emotion



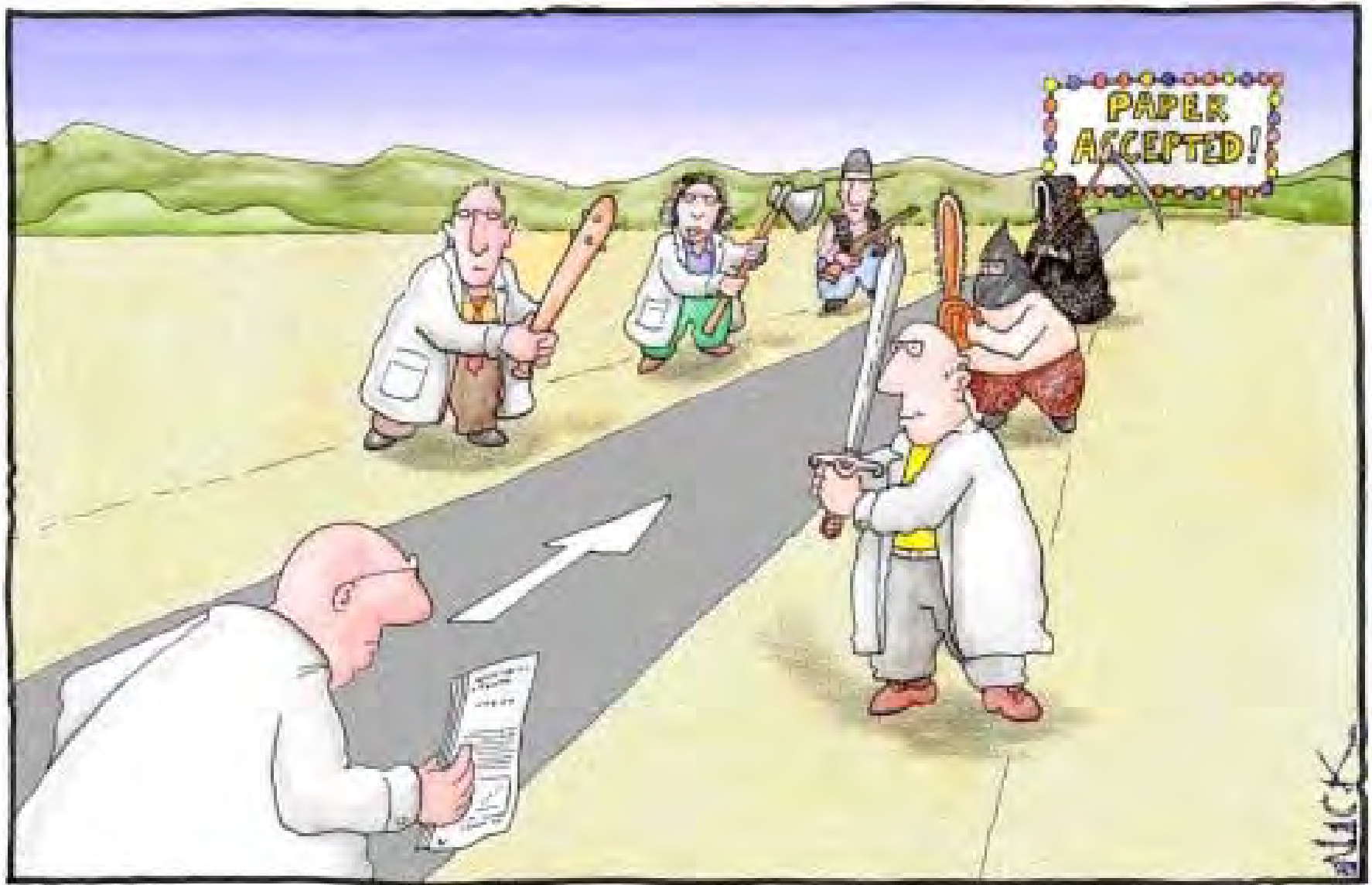
A necessary evil: The challenges of peer review from all sides

Mohamed Noor

Duke University

Sigma Xi Ethics Symposium

November 11, 2011



Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

Purpose



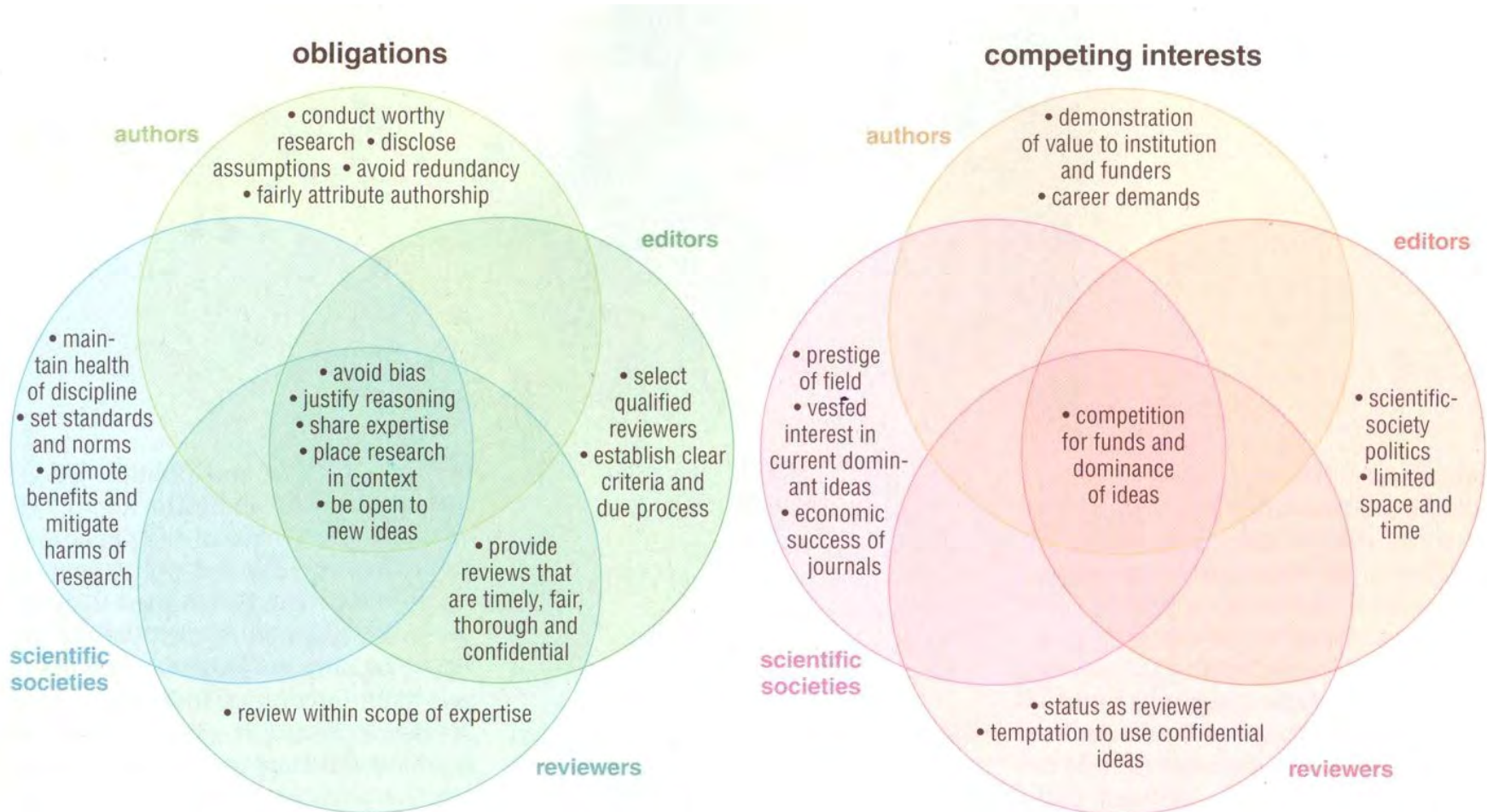
- Additional “eyes” to evaluate if results justify conclusions drawn
 - Identify alternative conclusions
- Improve presentation of study
 - Placed in context of existing knowledge
 - Points made are clear & precise
- Assess significance/ impact of work

Primary players

- Author(s) of manuscript
 - Contribute study
 - Respond to comments
- Anonymous reviewers
 - Provide valuable feedback
- Editors
 - Assess reviewers' feedback
 - Ensure author compliance



Obligations vs. interests...



Authors...

- Decide whether to lump vs. split
 - “Big splash” down to “MPU”
- Pressure to publish in “top-tier” journals
 - Career advancement, grants, recognition
- How bold to be in claims



Editors



- Initially assess impact of research
 - Don't waste time of reviewers (& authors)
- Identify reviewers with appropriate expertise
 - ... but without too much “connection”
- Make sure peer review process is completed fairly, rigorously, and in a timely manner



Reviewers

- Rigorously assess the quality, impact, and presentation of research
- Suggest improvements in content and presentation
- Maintain confidentiality of work & ideas



“Obvious” causes of conflict



- Reviewers & editors
 - ****Time & effort for rigorous review****
 - Self-control / reasonable expectations
- Authors
 - External pressures to oversell & get multiple papers in top journals
 - Internal pressures within team





Digging deeper on the conflicts



- Lack of reward structure for service
- Lingering sense of insufficient appreciation of one's past research efforts
- Career advancement and funding driven heavily by publication "outlet" and "numbers" rather than "conceptual advances"
- All inter-related

Rewards for service???

- Pay for peer review rare and undervalued
 - Greatest need for scientists is **TIME**
 - Paths to increasing it not obvious
- Some society journals offer AEs travel \$\$\$
- Highlights for outstanding reviewers?
 - “Critical thinker” awards for grad students/
postdoc reviewers?



Restructure research record???

- CV format highlights publication “outlets” and “numbers”
 - Ignores “impact”
- **Crazy idea** for jobs/ promotions
 - DON'T ask for CV (ask to exclude it)
 - Evaluate based on “research statement”
 - Can have numerical citations for reference
 - Top 5 or 10 “conceptual advances” list???



Some movement in this direction already...

PLoS ONE will rigorously peer-review your submissions and publish **all** papers that are judged to be technically sound. **Judgments about the importance of any particular paper are then made after publication by the readership** (who are the most qualified to determine what is of interest to them).



... but there are problems with these ideas, too...

- If authors self-represent conceptual advances, how can naïve readers get a sense of their “veracity” vs. “overselling”?
- Where does the money for sending AEs to conferences come from?
- On what basis are the reviewer awards given?



Our system functions pretty well, considering...

- All “honor system”
- Nearly all participants are volunteers
- No movements for major changes have gained traction (except *PLoS One* style)
- “Worst form ... except all those others” --Churchill

SCIENTIFIC
PEER REVIEW



SIGMA XI

THE SCIENTIFIC RESEARCH SOCIETY

Thank you!





AUTHORSHIP ACROSS BORDERS

Melissa S. Anderson

University of Minnesota

Sigma Xi, November 2011

INTERNATIONAL RESEARCH
COLLABORATIONS:
MUCH TO BE GAINED,
MANY WAYS TO GET IN TROUBLE

Edited by
Melissa S. Anderson
and Nicholas H. Steneck



INTEGRITY IN INTERNATIONAL COLLABORATIONS

Melissa S. Anderson (U. of Minnesota)

Raymond DeVries (U. of Michigan)

Consultants

Eric Campbell (Mass. General Hospital)

David Chapman (U. of Minnesota)

Assistants

Felly Chiteng Kot

Marta A. Shaw

Christine Lepkowski



INTEGRITY IN INTERNATIONAL COLLABORATIONS

Data Sources:

10 Focus Groups

60 Interviews

National survey of NIH-funded PI's:

Sample of 5,000

Responses from 2,025

Corrected response rate 41.9%



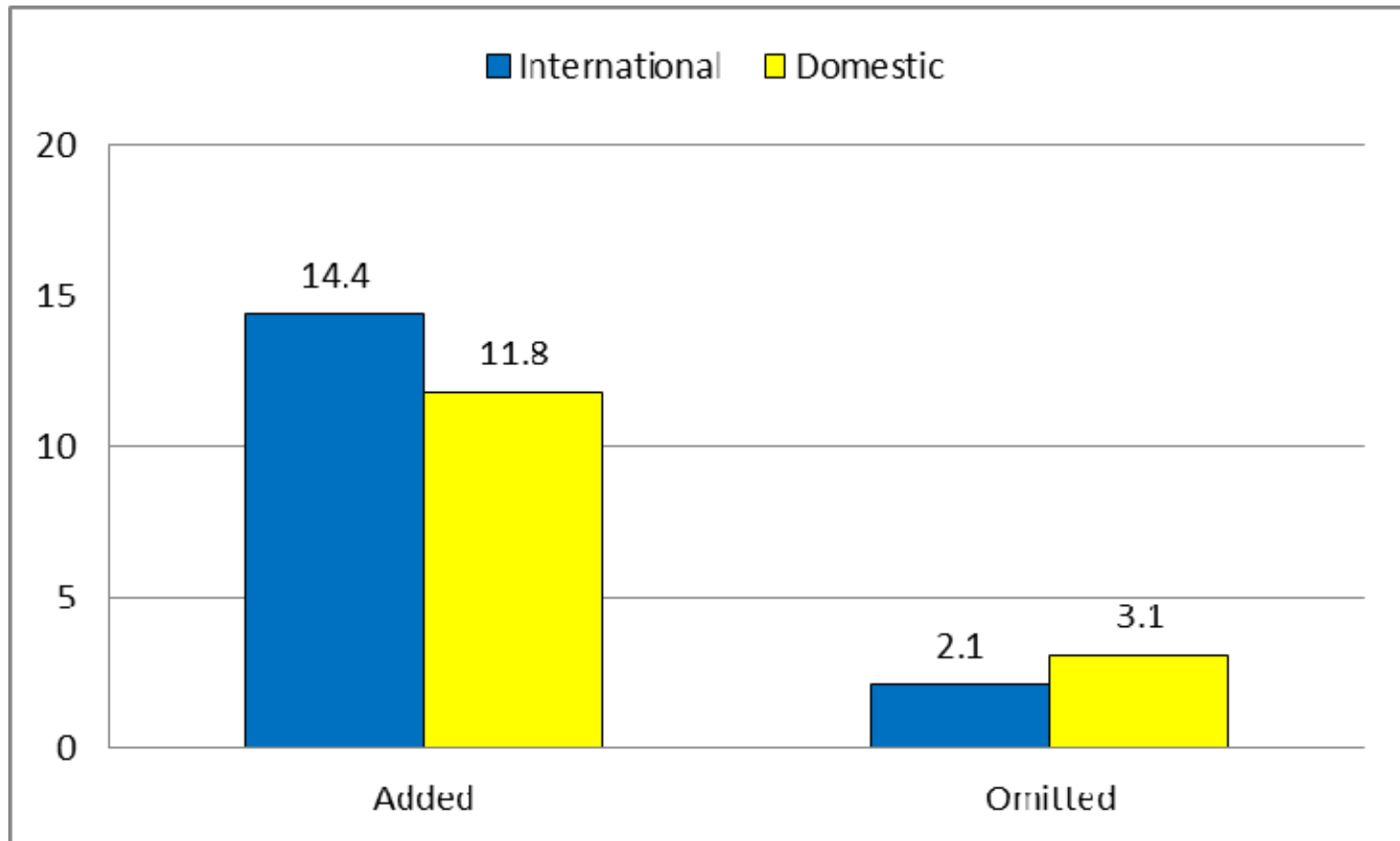
AMERICAN SCIENTIST / MAY-JUNE 2011 "AUTHORSHIP DIPLOMACY"

- Added authors
 - Surprise
 - Gift
 - Honorary
 - Legitimizing

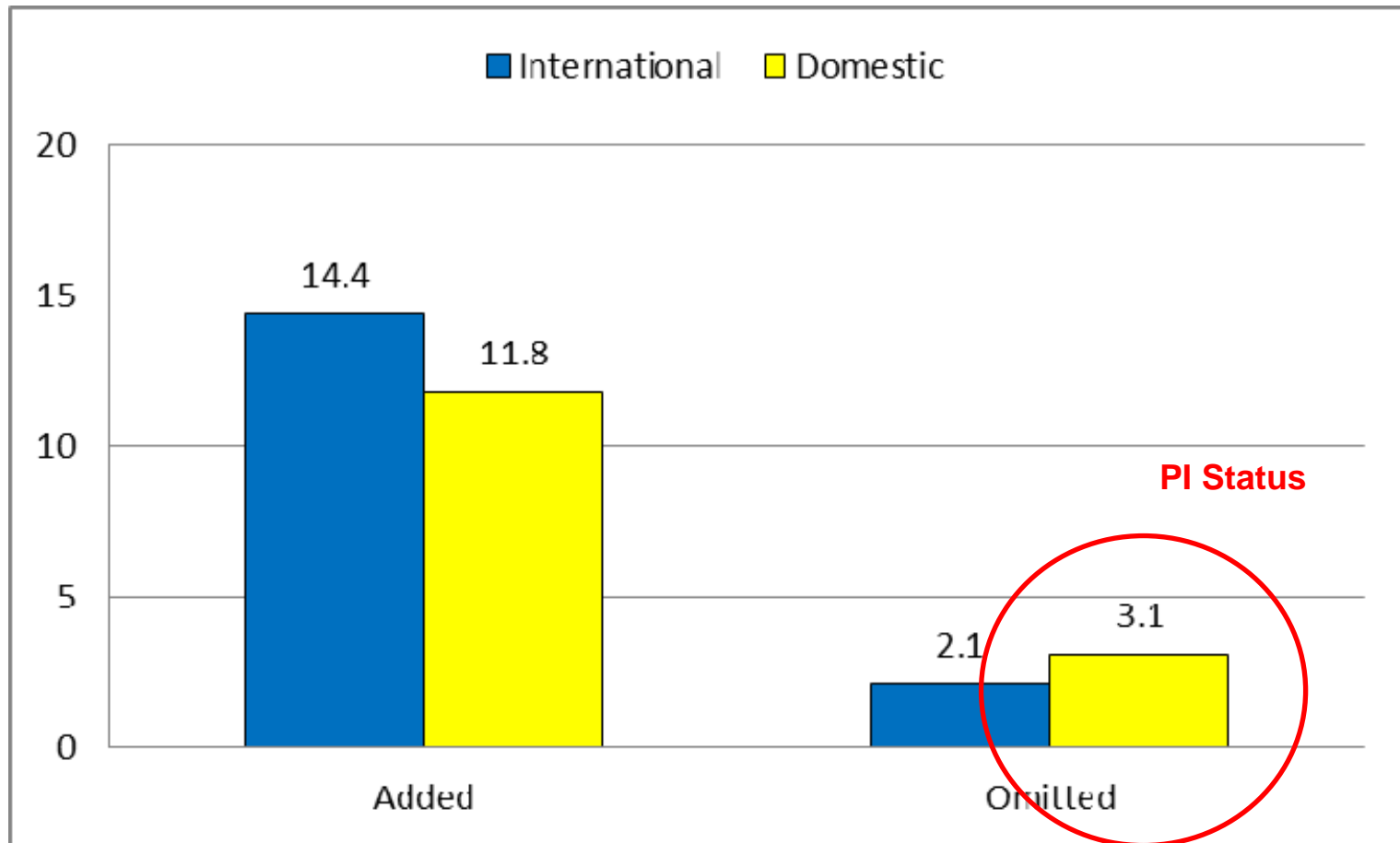
- Omitted authors
 - Ghost
 - Sensitive



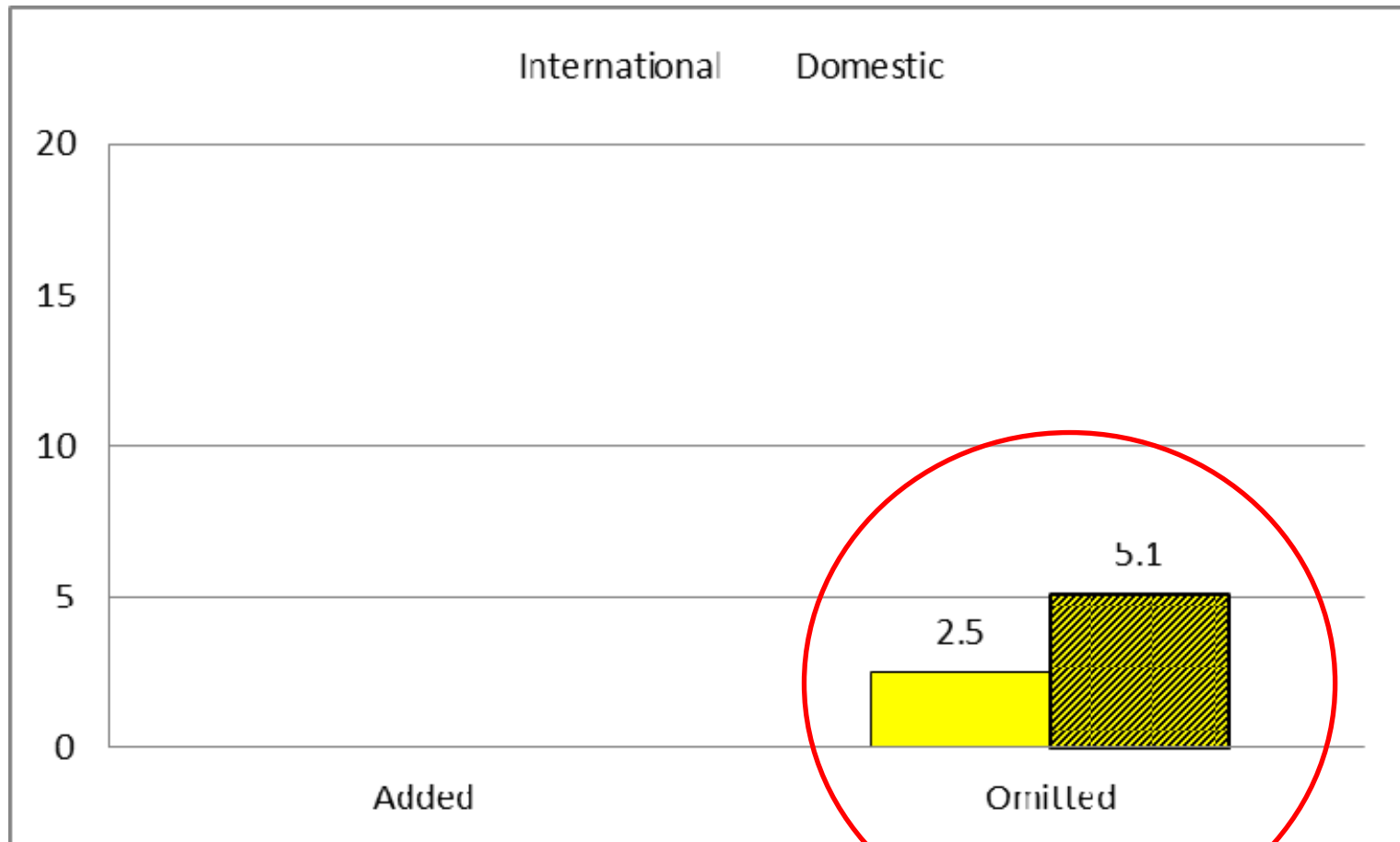
ADDED AND OMITTED AUTHORS



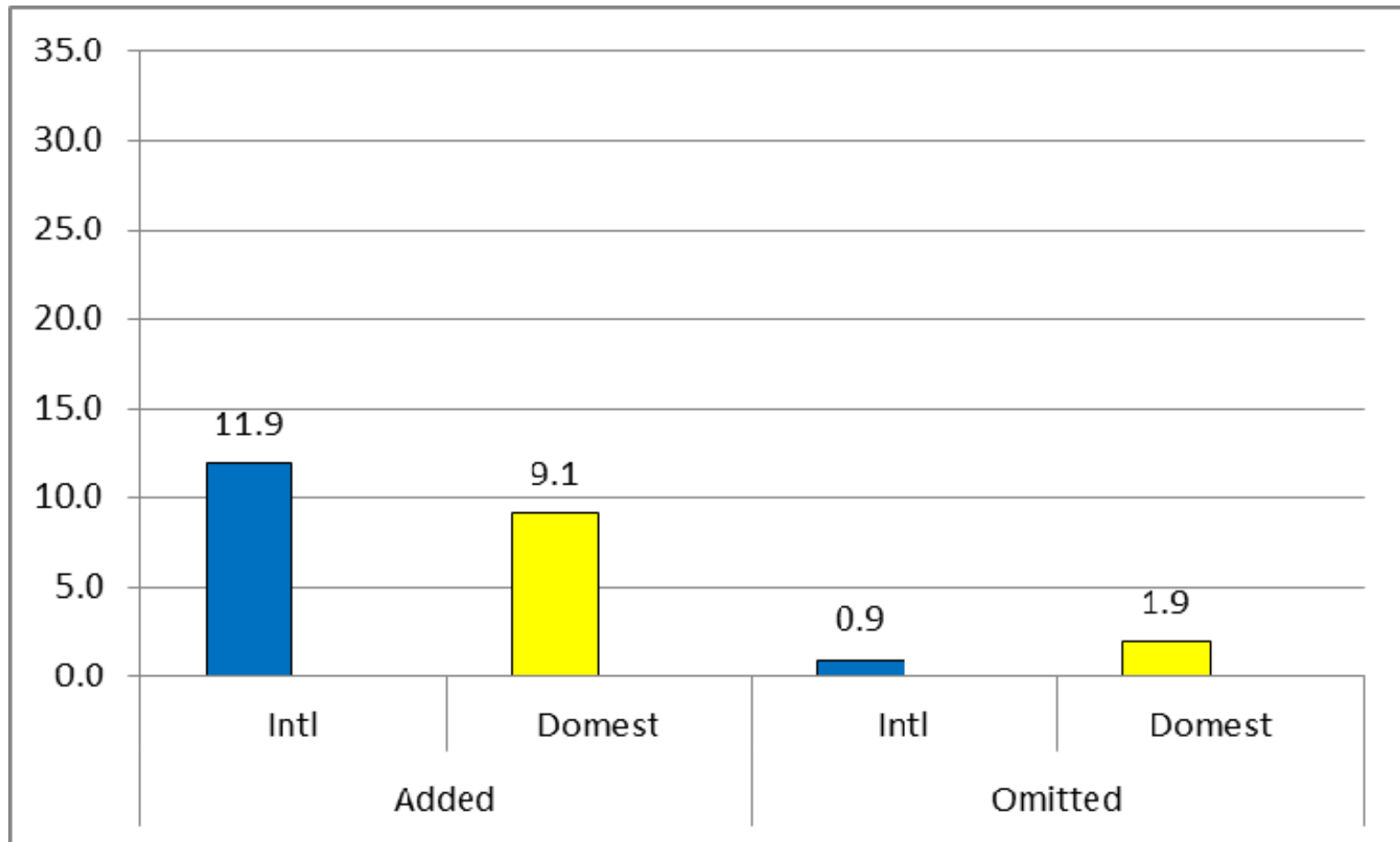
ADDED AND OMITTED AUTHORS



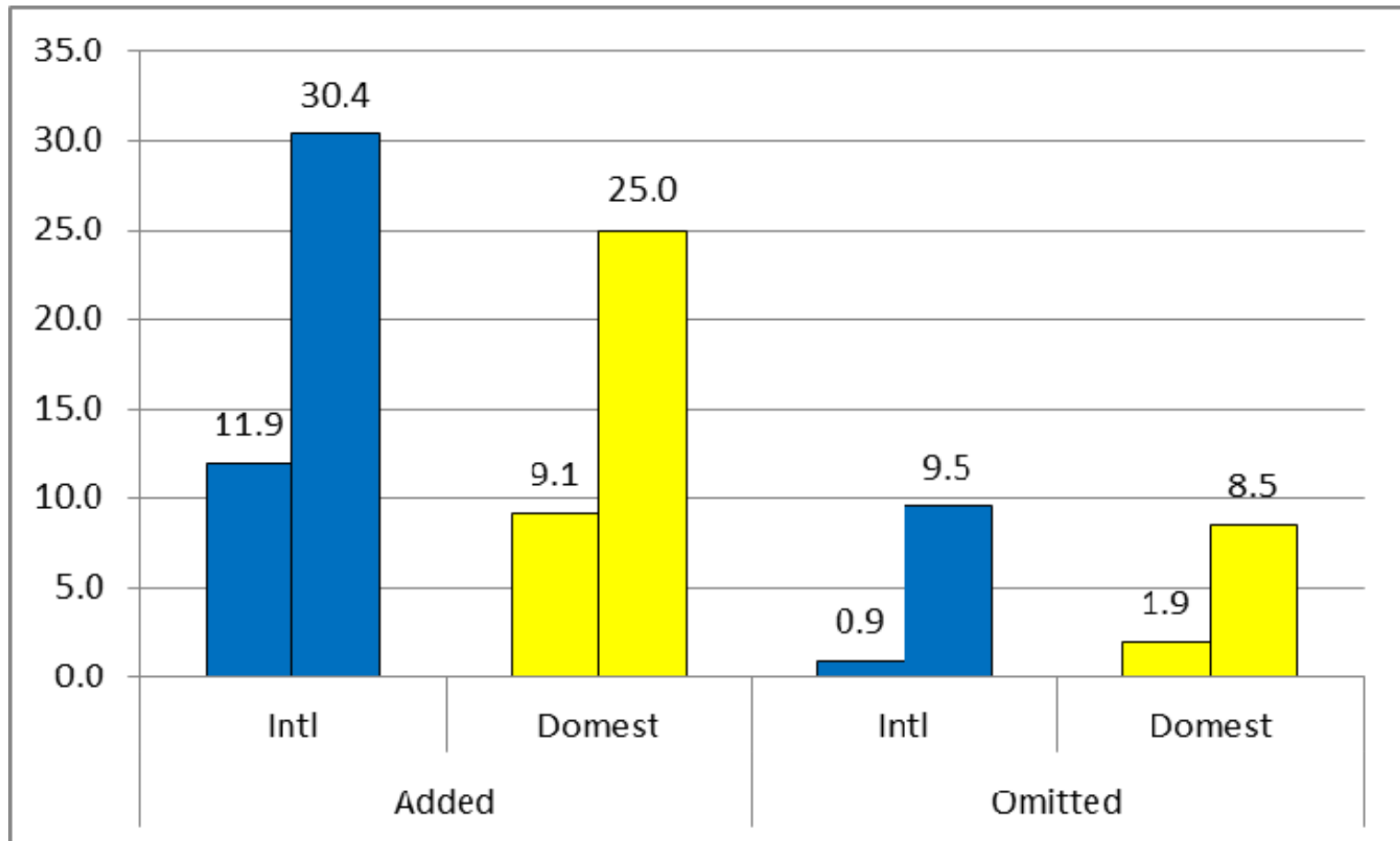
ADDED AND OMITTED AUTHORS



LOW-COMPETITION COLLABORATIONS



HIGH-COMPETITION COLLABORATIONS



INTERNATIONAL GUIDANCE ON AUTHORSHIP / INTEGRITY

- Singapore Statement on Research Integrity
 - Second World Conference on Research Integrity
 - Singapore, 2010



Singapore Statement on Research Integrity

Preamble. The value and benefits of research are vitally dependent on the integrity of research. While there can be and are national and disciplinary differences in the way research is organized and conducted, there are also principles and professional responsibilities that are fundamental to the integrity of research wherever it is undertaken.

PRINCIPLES

Honesty in all aspects of research
Accountability in the conduct of research
Professional courtesy and fairness in working with others
Good stewardship of research on behalf of others

RESPONSIBILITIES

1. Integrity: Researchers should take responsibility for the trustworthiness of their research.

2. Adherence to Regulations: Researchers should be aware of and adhere to regulations and policies related to research.

3. Research Methods: Researchers should employ appropriate research methods, base conclusions on critical analysis of the evidence and report findings and interpretations fully and objectively.

4. Research Records: Researchers should keep clear, accurate records of all research in ways that will allow verification and replication of their work by others.

5. Research Findings: Researchers should share data and findings openly and promptly, as soon as they have had an opportunity to establish priority and ownership claims.

6. Authorship: Researchers should take responsibility for their contributions to all publications, funding applications, reports and other representations of their research. Lists of authors should include all those and only those who meet applicable authorship criteria.

7. Publication Acknowledgement: Researchers should acknowledge in publications the names and roles of those who made significant contributions to the research, including writers, funders, sponsors, and others, but do not meet authorship criteria.

8. Peer Review: Researchers should provide fair, prompt and rigorous evaluations and respect confidentiality when reviewing others' work.

9. Conflict of Interest: Researchers should disclose financial and other conflicts of interest that could compromise the trustworthiness of their work in research proposals, publications and public communications as well as in all review activities.

10. Public Communication: Researchers should limit professional comments to their recognized expertise when engaged in public discussions about the application and importance of research findings and clearly distinguish professional comments from opinions based on personal views.

11. Reporting Irresponsible Research Practices: Researchers should report to the appropriate authorities any suspected research misconduct, including fabrication, falsification or plagiarism, and other irresponsible research practices that undermine the trustworthiness of research, such as carelessness, improperly listing authors, failing to report conflicting data, or the use of misleading analytical methods.

12. Responding to Irresponsible Research Practices: Research institutions, as well as journals, professional organizations and agencies that have commitments to research, should have procedures for responding to allegations of misconduct and other irresponsible research practices and for protecting those who report such behavior in good faith. When misconduct or other irresponsible research practice is confirmed, appropriate actions should be taken promptly, including correcting the research record.

13. Research Environments: Research institutions should create and sustain environments that encourage integrity through education, clear policies, and reasonable standards for advancement, while fostering work environments that support research integrity.

14. Societal Considerations: Researchers and research institutions should recognize that they have an ethical obligation to weigh societal benefits against risks inherent in their work.





CONTACT:

Melissa S. Anderson



mand@umn.edu



NIEHS

**National Institute of
Environmental Health Sciences**



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

The Importance of International Standards for Authorship, Publication, and Peer Review

David B. Resnik, JD, PhD
Bioethicist, NIEHS/NIH

This research is supported by the intramural program of NIEHS.
It does not represent the views of NIEHS, NIH, or the US
government.

Why we need international standards

- Science is a global activity.
- Journals are international.
- There need to be common understandings of ethical standards, such as authorship and peer review.
- Researchers from different countries may have different understandings of ethical obligations relating to authorship, publication, and peer review.
- According to Weiqin Zeng, a Chinese student who studied with me from 2009-2010, ideas of authorship and plagiarism are different in her country.
- Graduates students and post-docs in my RCR training classes have also related that their countries have different concepts of authorship and plagiarism.

Why we need international standards

Example: dispute over plagiarism discovered in 70 papers on arXiv (physics preprint server). Many were authored by Turkish scientists with a poor command of English who used English sentences from other sources without attribution. *Nature* 2007; 449: 8.

“The accusations made by arXiv that my colleagues and I have plagiarized the works of others...are upsetting and unfair...Borrowing sentences in the part of a paper that simply helps to better introduce the problem should not be seen as plagiarism. Even if our introductions are not entirely original, our results are—and these are the most important part of any scientific paper.” Ihsan Yilmaz, *Nature* 2007; 449: 658.

"There are some cultures in which plagiarism is not even regarded as deplorable," Katepalli Sreenivasan, director of the International Centre for Theoretical Physics in Trieste, Italy, *Nature* 2007; 449: 8.

Why we need international standards

- Was this plagiarism? How should the issue of “borrowing” sentences be dealt with?
- What does this issue say about what some people (or cultures) think about authorship and plagiarism?
- US/Europe: emphasis on individual responsibility, accountability, and credit.
- Other countries: less emphasis on individuality?

Why we need international standards

- Unethical authorship practices, such as ghost authorship and honorary authorship are well-documented, despite guidelines from journals. Guidelines have helped to decrease these practices from 29.2% of articles to 21.0% from 1996 to 2008. Wilsar JS et al. *BMJ*. 2011 Oct 25;343:d6128. doi: 10.1136/bmj.d6128.
- Ethical problems (e.g. breach of confidentiality, stealing ideas, personal attacks, incompetence) also arise in peer review. Resnik DB et al. *Sci Eng Ethics*. 2008;14:305-10.
- We do not know what role international disagreement about ethics plays in the prevalence of these problems relating to authorship and peer review, but it likely plays an important role, because different cultures may have different attitudes toward ethics.

International guidelines

- International Committee of Medical Journal Editors (ICMJE). Includes guidelines for authorship (substantive), peer review (not substantive), conflict of interest (substantive), and redundant publications (substantive).
<http://www.icmje.org/>
- The Committee on Publication Ethics (COPE) has guidelines for editors and peer reviewers (substantive) and authorship (substantive). <http://publicationethics.org/>
- The Singapore Statement on Research Integrity also has guidelines on authorship, publication, and peer review. These are very general, not detailed.
<http://www.singaporestatement.org/statement.html>

International guidelines

- Are these guidelines sufficient? What more needs to be done?
- Many journals do not follow ICMJE or COPE.
- How many people know about the Singapore Statement?
- Does more work need to be done to improve these guidelines or publicize them?
- Should professional associations with significant influence endorse these guidelines?
- Thanks!
- Questions?

RCR Standards Survey: Authorship

1

**Daniel R. Vasgird, Director
Office of Research Integrity and Compliance
West Virginia University**

**2011 Sigma Xi Annual Meeting
November 11, 2011**

**(For the most part this presentation is drawn with encouragement
from a talk by Michael Kalichman to the UCSD Department of
Pathology.)**

“...I know that *knowledge can transform us*, that truth is not only a way of deciphering the world.”

- Michel Foucault “The Minimalist Self”

Premise

3

- Research, representing the systematic side of science, generally flourishes when the public which supports it and ultimately makes use of its products has high regard for its ways and means.
- Science and the global public can be seen in a *contract relationship*, sometimes explicit and others implicit.
- For the most part, the public bestows on science the *responsibility of hope for the future*.
- Therefore, every effort must be made to bolster the invaluable commodities of *respect and trust*.

The Harris Poll: 1977-2009

4

Biggest Changes in Occupations Rated for “Very Great Prestige” over Last 30+ Years:

- The Harris Poll first asked about occupations in 1977.
- Two occupations have lost substantial ground since 1977: *scientists, down 9 points from 66% to 57%,* and lawyers, down 10 points to 26%.

HHS ORI RCR Guidance, 2005

5

“Instruction in the responsible conduct of research need not be driven by federal mandates, for it derives from a premise fundamental to doing good science: the responsible conduct of research is not distinct from research.”

FSGO Compliance & Ethics Elements

6

- Implementing written policies & procedures;
- Designating compliance officer & committee;
- Careful delegation of authority;
- *Conducting effective training and education;*
- Developing effective lines of communication;
- Conducting internal monitoring and auditing;
- Enforcing standards through well-publicized disciplinary guidelines; and
- Responding promptly to detected problems.

NIH RCR Standards Project

PI: Michael Kalichman, UCSD

7

- “To facilitate effective teaching about the responsible conduct of research, it is essential to have a framework that encompasses current standards of conduct in the areas of data management, collaboration, and authorship.”
- Questions for scientists: what are their standards of conduct and what do they believe should be the standards of conduct.
- Authorship has a special place within the RCR since it is the recognized “coin of the realm”.

Hypothesis and Key Questions

8

Project's Hypothesis: Some, but not all, standards of conduct can be generalized across more than one field of research.

Therefore, the key questions are:

1. Within selected research disciplines, which standards of conduct are commonly accepted?
2. Within selected research disciplines, which standards of conduct vary widely?
3. Among selected research disciplines, which standards of conduct are commonly accepted and which are not?

Survey

9

- **Disciplines:** Microbiology, Neuroscience, Nursing, Psychology
- **Process:**
 - Focus Groups, Draft, Interviews, and Revision
 - Selection of graduate programs and faculty
 - Final Survey → E-mail invitations

Graduate Program Affiliation

10

DISCIPLINE	Invitations	Respondents	Response Rate
Microbiology	1245	241	19%
Neuroscience	2912	522	18%
Nursing	1550	414	27%
Psychology	1270	219	17%

Respondent Characteristics (Median)

11

<i>Years as PI</i>	10
<i>Published papers</i>	35
<i>First or Senior</i>	20
<i>Faculty</i>	15
<i>Academic Rank</i>	
Assistant	351
Associate	394
Full	596
Other	31

Overall Results

12

- Results for nearly all questions were highly statistically significant: This suggests that there was some weighting toward one answer over another (= consensus?)
- Results for nearly all questions comparing disciplines were highly statistically significant: This suggests that there were differences among the disciplines (= lack of consensus?)

Disciplinary Consensus

Agree 
 Neither 
 Disagree 

13

• Authorship

- Only statements not statistically significant: 1, 3

Q1: In my experience, the characteristics of good authorship practices are commonly understood by researchers.

	N	Mean	SD
Microbiology	252	3.58	1.07
Neuroscience	468	3.68	1.02
Nursing	403	3.52	1.07
Psychology	246	3.70	0.96



Q3: In my experience, the first author of a manuscript is the one who wrote the first draft.

	N	Mean	SD
Microbiology	251	3.41	1.28
Neuroscience	469	3.39	1.27
Nursing	400	3.38	1.32
Psychology	242	3.54	1.11



1=Strongly Disagree

5=Strongly Agree

Disciplinary Consensus

14

- Authorship

- Results with max. difference > 1 point on the agree scale: 23, 30

Q23: In my opinion, it is *not possible* to establish criteria for authorship before the work begins.

	N	Mean	SD
Microbiology	251	3.04	1.29
Neuroscience	466	2.81	1.30
Nursing	401	1.93	1.08
Psychology	243	2.16	1.11

Q30: In my opinion, an individual *should* be listed as an author even if her or his sole contribution was to provide the idea for the research project.

	N	Mean	SD
Microbiology	251	3.61	1.05
Neuroscience	465	3.55	1.16
Nursing	403	2.86	1.31
Psychology	245	3.50	1.22

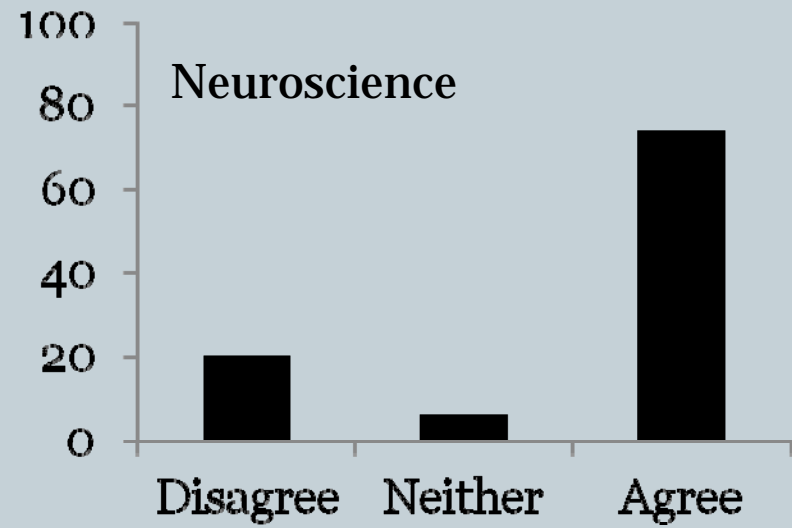
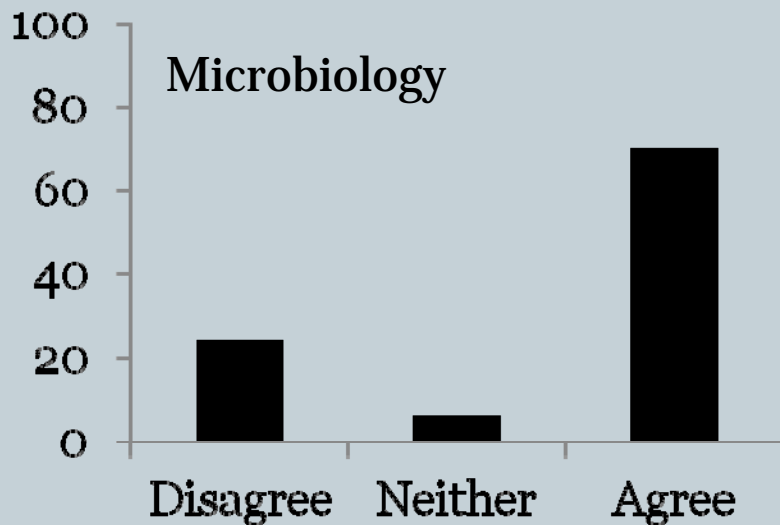
1=Strongly Disagree

5=Strongly Agree

Understanding of Good Practices

15

- Q1: In my experience, the characteristics of good authorship practices are commonly understood by researchers.
 - Psych: A (76%), D (18%)

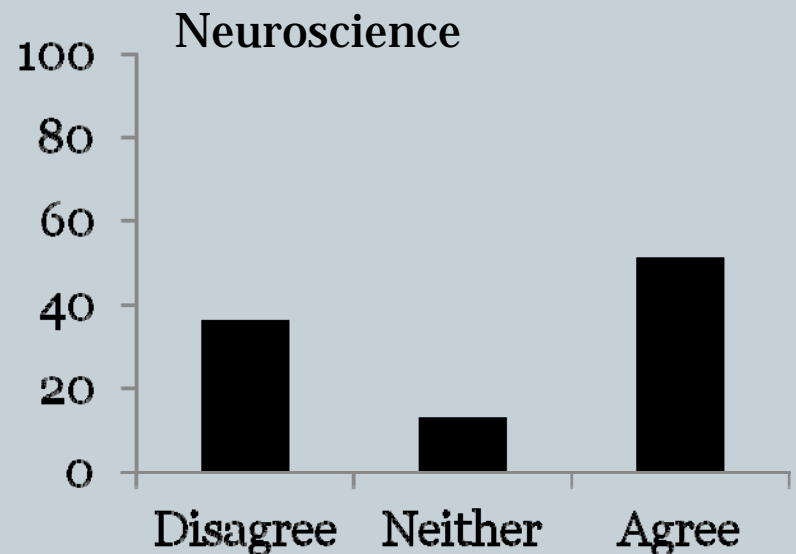
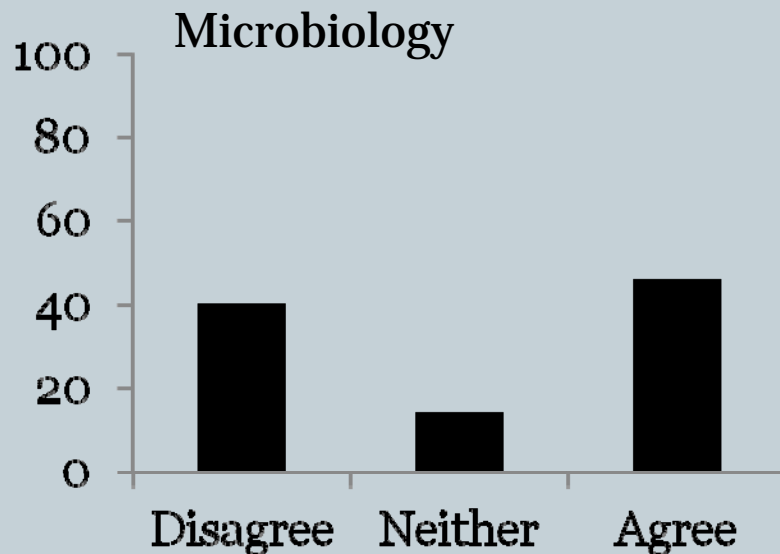


Percent

Early Conversations

16

- Q2: In my experience, conversations about allocation of authorship occur at the beginning of a new collaboration.
 - Psych: A (54%), D (30%)

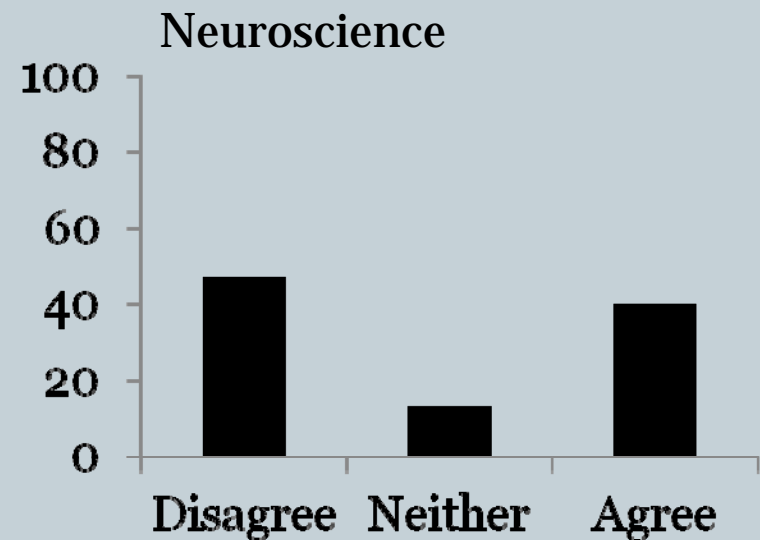
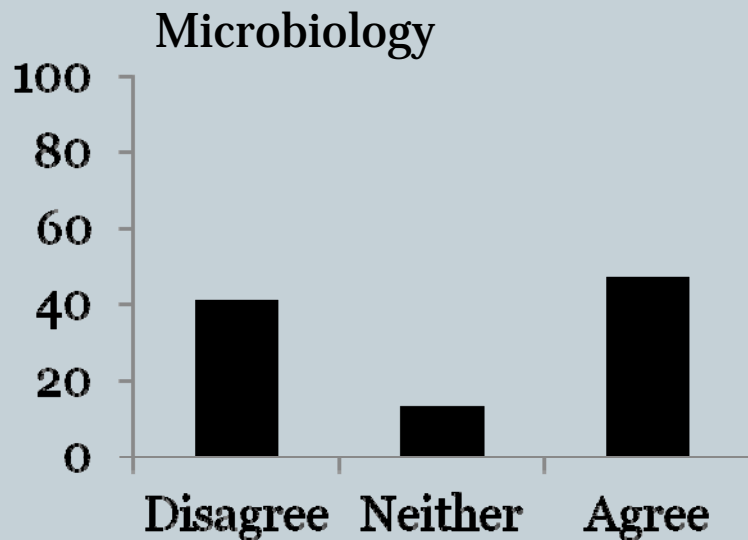


Percent

Early Conversations

17

- Q23: In my opinion, it is *not possible* to establish criteria for authorship before the work begins.
 - **Psych: A (17%), D (71%)**

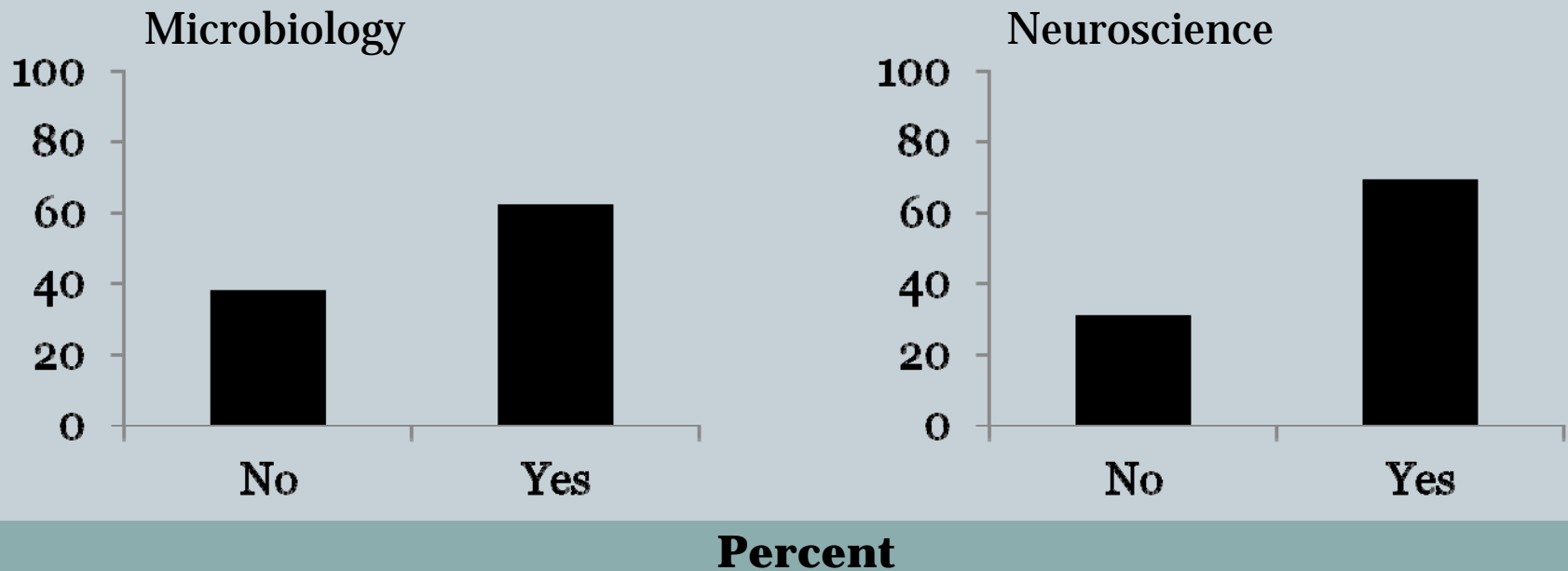


Percent

Early Conversations

18

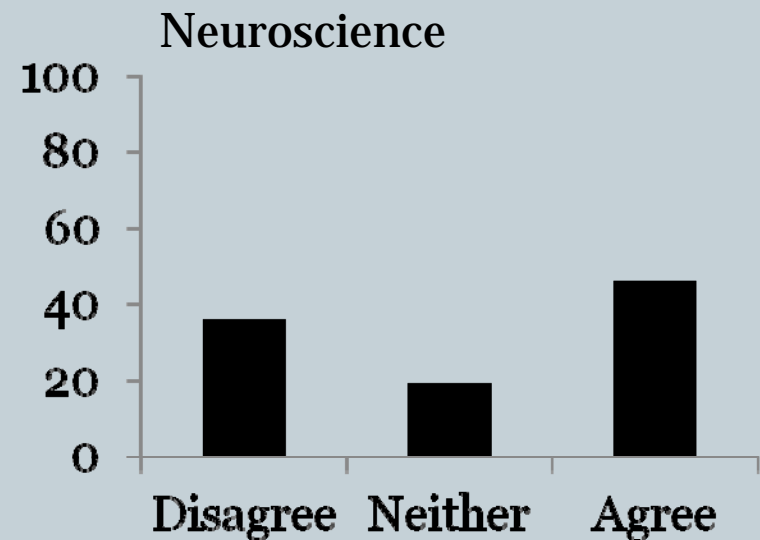
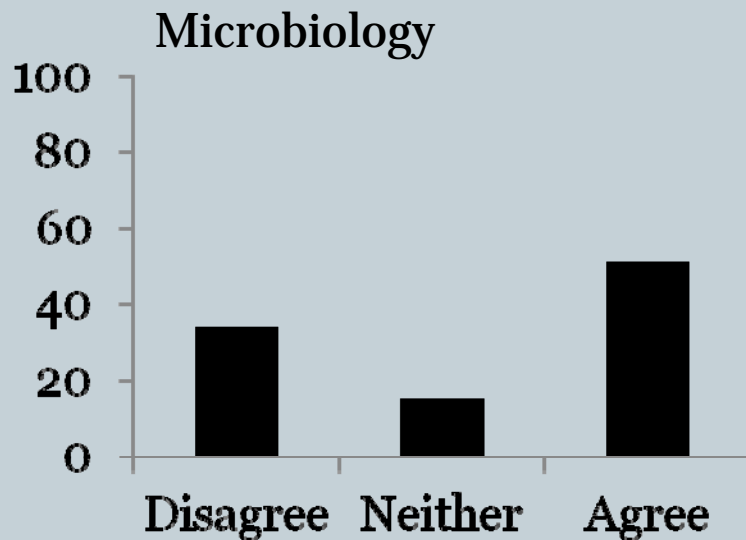
- Q40: I typically have conversations in the early stages of a collaboration about tentative plans for allocation of credit and order of authorship.
 - **Psych: Y (84%), N (16%)**



Authorship for Materials or Patients

19

- Q38: In my opinion, it is *acceptable* to allocate authorship credit to acknowledge the contribution of materials or patients.
 - **Psych: A (31%), D (51%)**

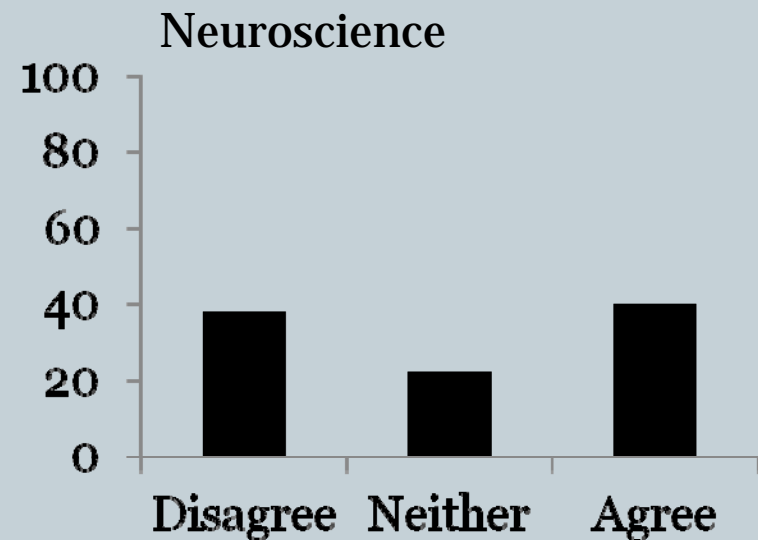
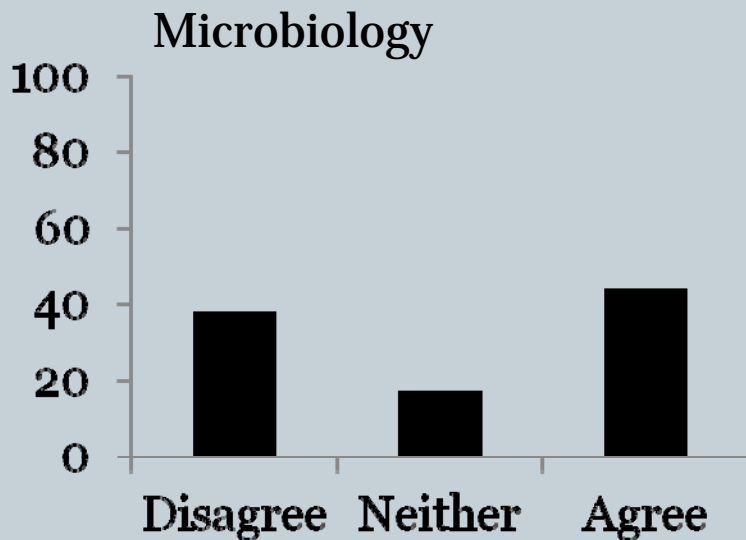


Percent

Authorship for Materials or Patients

20

- Q31: In my opinion, an individual *should* be listed as an author even if her or his sole contribution was to provide materials, reagents, or patients for the research project.
 - Psych: A (26%), D (58%)

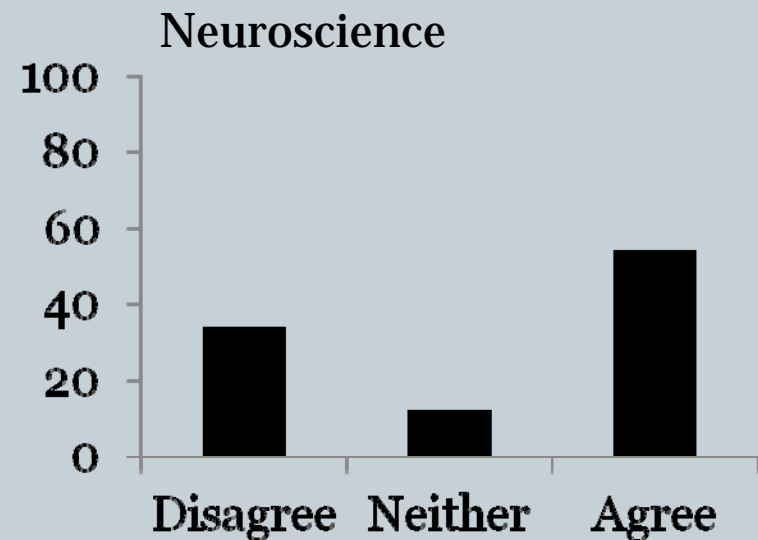
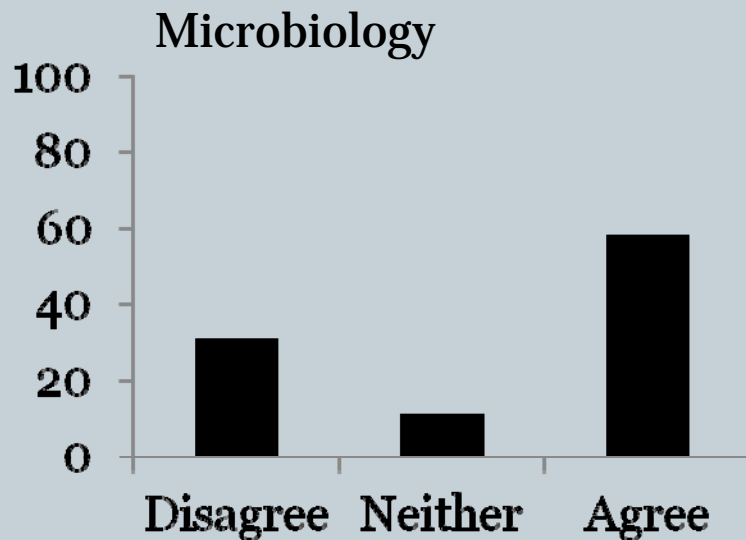


Percent

Funding

21

- Q32: In my opinion, an individual *should* be listed as an author even if her or his sole contribution was to provide the funding for the research project.
 - **Psych: A (30%), D (55%)**

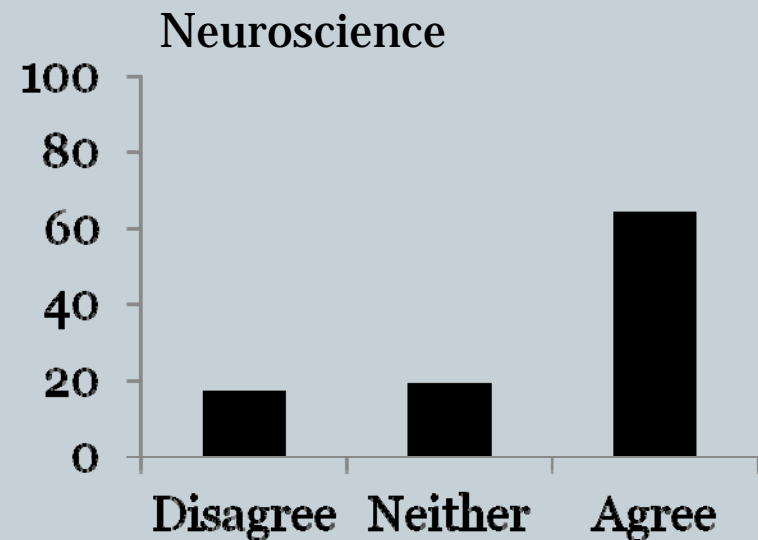
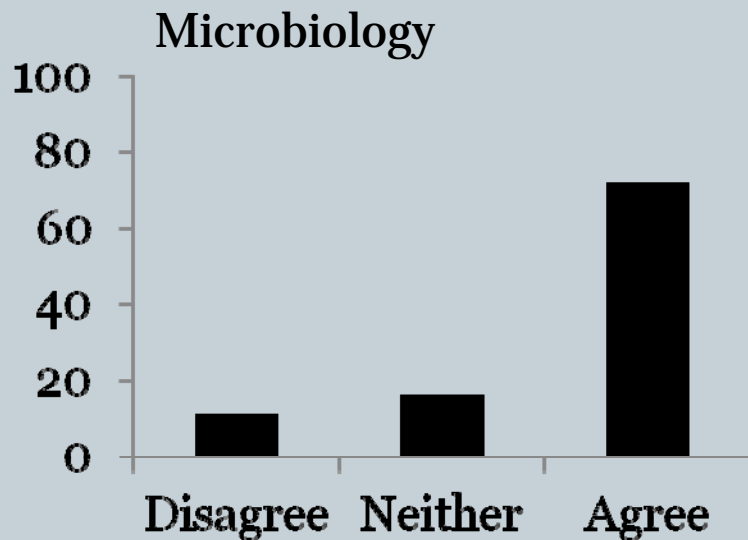


Percent

Statistical Analysis

22

- Q34: In my opinion, an individual *should* be listed as an author even if her or his sole contribution was to provide necessary help in statistical analysis.
 - Psych: A (67%), D (12%)

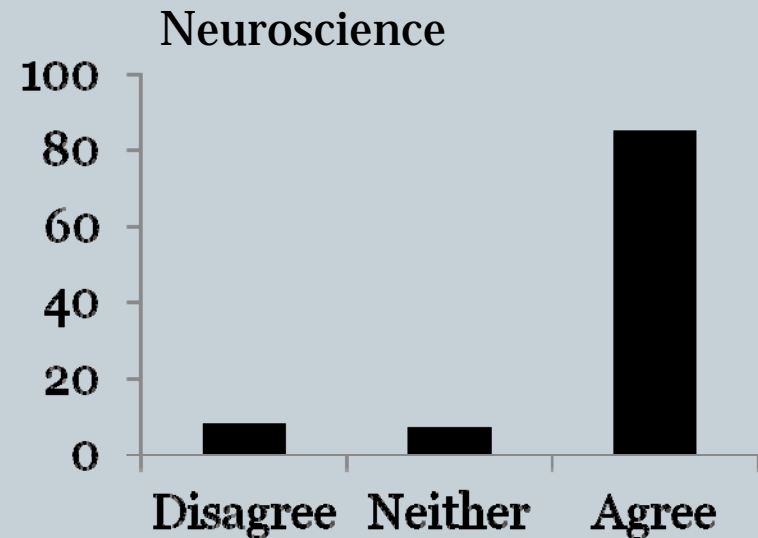
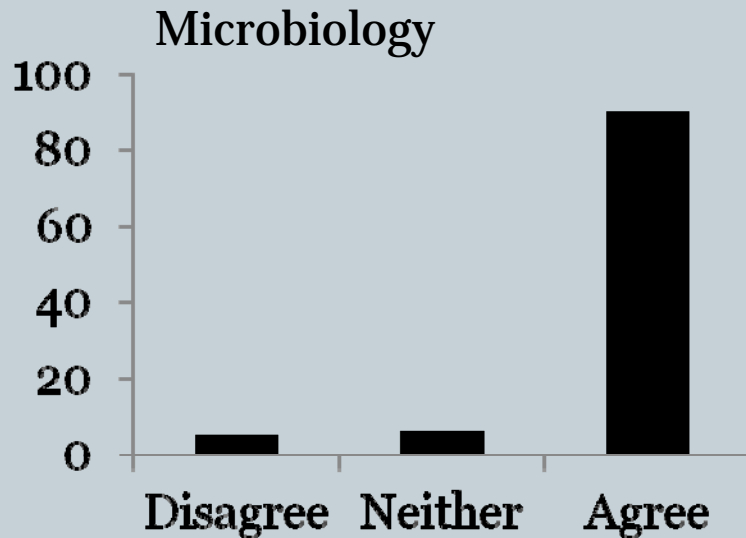


Percent

First Author

23

- Q4: In my experience, the first author of a manuscript is the one who did the most work on the project.
 - Psych: A (74%), D (10%)

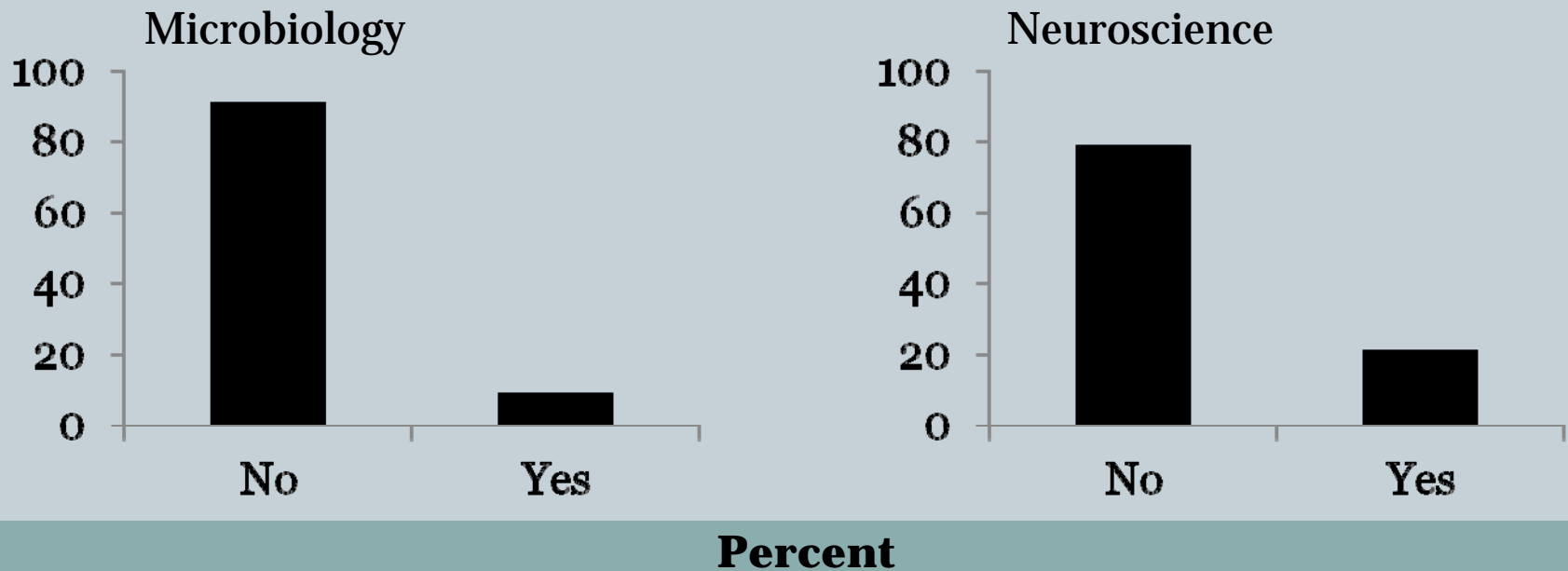


Percent

First Author

24

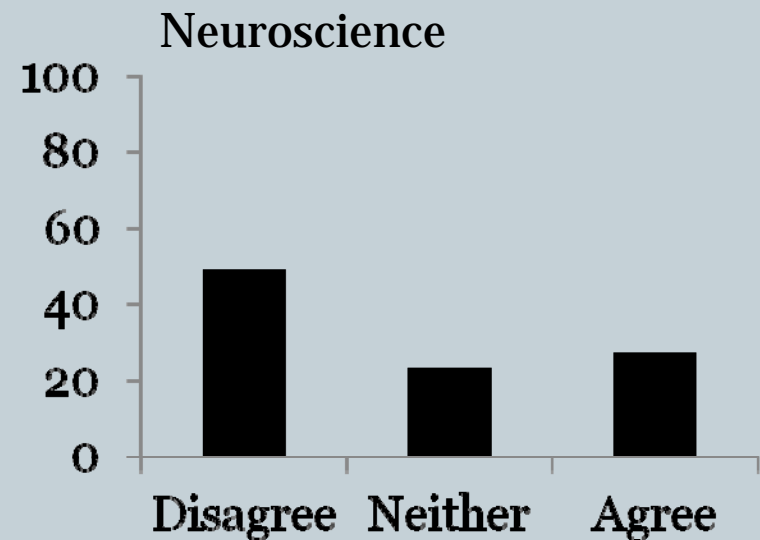
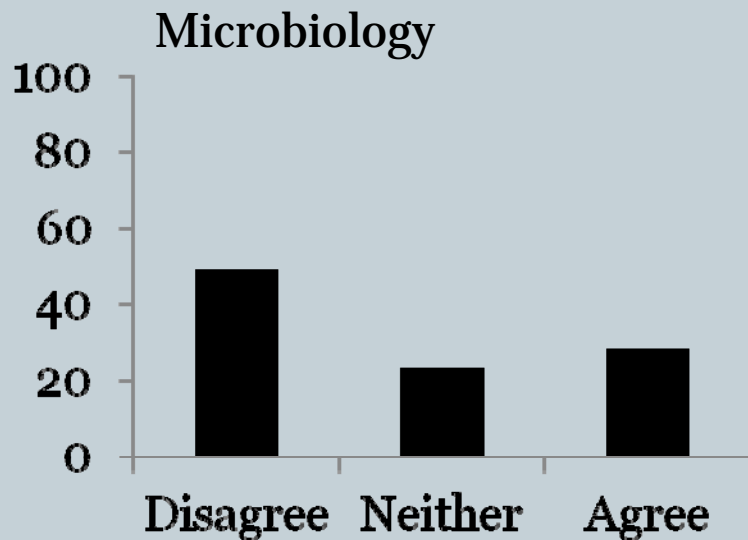
- Q17: In my experience, the head of the research group is often listed as first author.
 - **Psych: Y (66%), N (34%)**



Contributions

25

- Q6: In my experience, journals list contributions of each of the authors.
 - **Psych: A (10%), D (76%)**

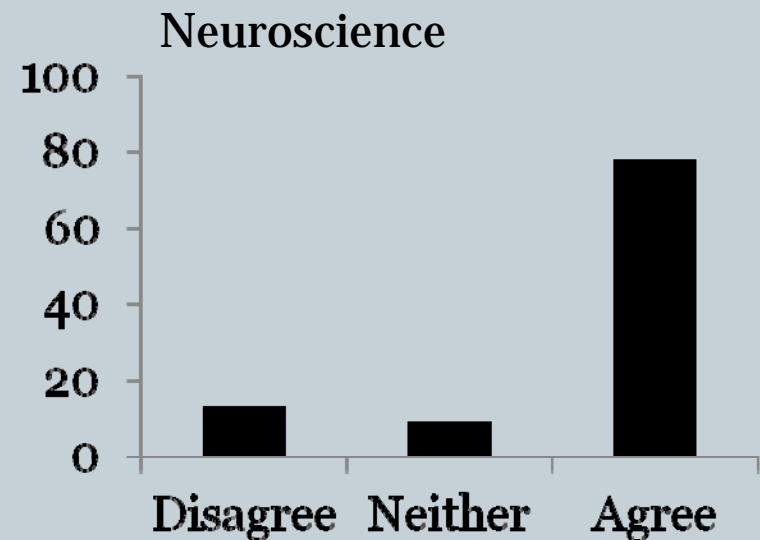
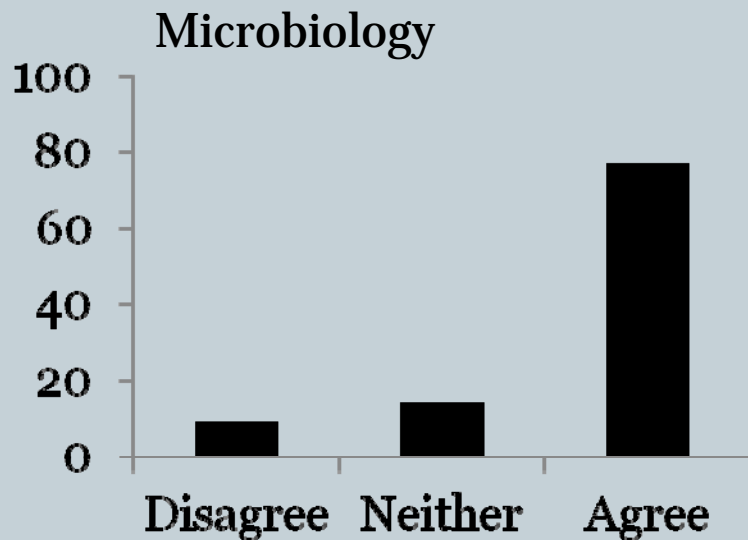


Percent

Contributions

26

- Q25: In my opinion, listing the contributions of each author is an improvement on the conventional model of simply listing the authors of a paper.
 - Psych: A (53%), D (24%)



Percent

What does it all mean?

27

1. The idea of commonly accepted standards of authorship is largely a myth.
2. Even within the disciplines of microbiology or neurosciences, there is considerable variation in criteria for authorship.
3. **Early and frequent conversations about plans for authorship would be helpful to clarify different perceptions among collaborators.**