ACCEPTING THE LIKELIHOOD OF AMBIGUITY AND DISAGREEMENT ON MORAL MATTERS: TRANSITIONING INTO THE "GRAY WORLD"

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INTRODUCTION

Efforts at introducing research ethics into the graduate and undergraduate university curricula have been motivated—as in other areas of practical and professional ethics—by highly publicized scandals such as the Tuskegee experiments (Ferrer, 2007, pp. 73-78), the Baltimore case (Kelvès, 1998), and recently publicized prisoner experiments carried out in Guatemala (Miller, 2010). Government agencies such as the National Institutes of Health and the National Science Foundation have responded by funding efforts to integrate research ethics into graduate and undergraduate university curricula. This paper reports on a broader impact project stemming from an NSF-funded grant where graduate students trained in research ethics led workshops to introduce pre-university students to this same theme. Graduate and faculty mentors associated with GERESE¹ (Graduate Experience in Research Ethics in Science and Engineering) have developed a workshop on research ethics that has been delivered at public and private schools, summer specialty camps, and science prep schools, all in the western part of Puerto Rico. The summer camp format has been carried out at Inter American University in Ponce (as part of the Upward Bound Math and Science program) and at the University of Puerto Rico at Mayagüez through BETTer-IC, a Biotechnology Summer Camp organized by the Center for Hemispheric Cooperation (CoHemis) and through the Summer Transportation Institute (STI) organized through the Civil Infrastructure Research Center (CIRC). These workshops have guided students toward the vision that ethics is an integral part of engineering and scientific research. They learn that academically honest research is essential to the
acquisition of truth while socially responsible research can be unpacked as the ethical treatment of humans and animals in experiments as well as environmentally sound research practices.

The method employed begins with the “black and white” where right and wrong, good and bad, virtuous and vicious practices in scientific and engineering research are presented unambiguously and in sharp relief. For example, video vignettes acted out by students introduce elements of research misconduct (falsification, fabrication, plagiarism) in a simple, instantly recognizable form as they appear in the black and white world. Specially designed exercises—layered cases—make the transition to ambiguity by adding complicating circumstances onto simple and straightforward core scenarios. These include role conflicts, situational constraints, and factual and conceptual uncertainty. Transitioning step-by-step to the gray world opens students to the need to discuss moral complexity and positions them to understand the forms of disagreement and ambiguity that arise even among the well-intentioned.

**INITIAL WORKSHOP FORMAT**

In western Puerto Rico from 2007 to 2009, 352 pre-university students participated in workshops designed to introduce research ethics into science and engineering practice. With two graduate students (one from science, one from engineering) leading the activities, this workshop carried out the following:

- A PowerPoint presentation, entitled “The Gray World,” posits research ethics as an essential part of research and practice in science and engineering. The presentation uses concrete examples, short discussion scenarios, and a highly visual mode of delivery to take students from a black and white vision of ethics in science and engineering to a more nuanced, gray picture. Prepared by a faculty mentor and two graduate students, it employs a strategy of active learning where students are encouraged to discuss and synthesize ideas at key points.

- The “Ethical Issues in Academia” section of this presentation incorporates short videos based on a script developed by one of the authors and acted out by university students. These videos cover research misconduct (fabrication, falsification, plagiarism), conflict of interest and mentorship (issues pertaining to the research environment), and environmental responsibility (an issue pertaining
to socially responsible research). The videos portray these themes in clear, global terms to generate awareness of ethical issues and emphasize the important roles they play in everyday life. Building on this helps students prepare for a gray world scenario outlined at the end of the presentation. This scenario unfolds through successive slides, each of which adds conflict and complexity.

- Producing the videos and designing the presentation, “The Gray World,” proved an excellent learning experience both for the graduate students from the GERESE project who led the workshops and for the undergraduate students who acted out the different parts. It established informal but effective mentoring relationships: faculty advisors to graduate students and graduate students to pre-university students. These relationships emerged as important learning experiences and were enhanced with the help of ongoing workshop assessment activities.

There are different ways to draw students into the theme of research ethics. The version of “The Gray World,” directed to pre-university students raises the issue of freedom as a fundamental human attribute that students exercise in choosing their areas of concentration. But this choice is neither arbitrary nor is it without consequences. Ethics enters into the picture because choices can be supported by good or bad reasons. And freedom does not stop with career choice. It also can be exercised in terms of how one habitually conducts oneself in the context of a life-long career. A scientist can practice his or her field, for example, with or without care, with concern for minimizing the risk of harmful impacts or recklessly. In this way, the disregard for rigorous scientific research can quickly shade off into research misconduct; fabrication, falsification, and plagiarism are to be shunned in scientific practice because they interfere with its fundamental aim, the pursuit of truth. With this, the presentation establishes that research ethics is a fundamental part of scientific practice.

This presentation also maps out basic ethical terms. Students learn that ethics is the systematic, critical, and principled study of moral practices; these two realms overlap, even largely coincide, but ethics adds principles (for example, respect for autonomy, justice, and beneficence) that can be used to subject moral attitudes, beliefs, and practices to critical scrutiny and rigorous test. Students also study whether moral beliefs are relative or absolute; the presentation uses changing attitudes in Puerto Rico toward tattoos to distinguish matters of taste and custom from more fundamental and stable moral values. They also learn about
one of the signal events that gave rise to efforts to integrate ethics into engineering and scientific research: the Tuskegee experiments. In explaining this case, presenters emphasize the denial of treatment to the subjects of the experiment and the expanded notion of free and informed consent that grew out of reflection on this untoward occurrence. This introduction creates student awareness of the importance of ethics and the danger of ignoring it in science and engineering research.

The workshop then turns to issues directly pertinent to research ethics. GERESE principle investigator, Dr. Jorge Ferrer, uses a “double axiological axis” to sort out research ethics issues into an ordered taxonomy (Valdes et. al., 2009). An axis of truth generates the three “cardinal sins” of research ethics: plagiarism, fabrication, and falsification. These activities block the discovery of truth and place scientific inquiry on an unstable foundation. Students are provided with clear examples of unethical research practices and are also introduced to the scientific method and taught to practice verifying results and documenting activities. The other axiological axis organizes research ethics issues around social responsibility. This covers the ethical treatment of human and animal subjects in experiments and environmentally responsible research. Finally, students learn how socially responsible research includes the creation and maintenance of an ethical research environment through ethical mentoring and avoidance of conflict of interest.

The Gray World ends with a gray case. The strategy employed here of transitioning gradually to ambivalent situations has proven effective. Experience shows that pre-university students are overwhelmed when these concepts are introduced through formal definitions. Consequently, workshop organizers emphasize creating awareness by providing examples taken from the students’ everyday experience. For example, free choice is conveyed by a single road branching into two forks; clear-cut moral choices are conveyed by an individual with a devil on one shoulder and an angel on the other, each advocating its stance.

Clear examples are given of good and bad choices through six video vignettes. These show concrete instances of fabrication, falsification, plagiarism, mentoring, environmental responsibility, and conflict of interest. Each theme is placed in a short, dramatic context:

- **Mentoring.** This video shows a student struggling with a homework problem. Another student, her graduate mentor, rushes into the room, gives her the solution, and then rushes out saying that he has
to get to a basketball game. The parting shot: the struggling student
now has the correct answer but still doesn’t understand how to derive
it.

- **Peer Review.** A professor while reviewing research proposals finds
  one that doesn’t meet standards and changes it on the spot. With this
  change all proposals are now up to specs. Later on, he tells his
  graduate assistant, he’ll inform the author of the required changes
  made. The assistant seems puzzled by this approach to peer review.

- **Falsification.** Working with an Excel spreadsheet, one student
  shows another how to change values to smooth out a data curve.

- **Fabrication.** One student helps another on a homework project by
  showing him how to invent data to make the experiment’s results
  look better for the teacher.

- **Environmental Responsibility.** A car enters an empty parking lot.
  A window opens, and the driver throws out a bag of trash. The video
  concludes with the car quickly exiting the parking lot.

- **Conflict of Interest.** Dr. Augusto is reviewing candidates for the
  position of laboratory technician. Student Luis Colon is the most
  qualified. But his father, Dr. Colon, has refused in the past to steer
  funds to Augusto’s laboratory. Dr. Augusto questions whether he
  should hire Dr. Colon’s son even though he is the most qualified
  candidate.

- **Plagiarism.** A student shows his friend how to find an assignment
  online and copy-paste it into the required format and pass it off as an
  original homework. When his friend asks whether this is plagiarism,
  he shrugs it off by saying it’s “super easy.”

These videos give clear examples of ethical and unethical practices
in research ethics. While some question the use of such simplified
examples to introduce research ethics, the black and white world
provides the foundation for an encounter with the more nuanced “gray
world.” The strategy here is not to avoid problematic, “gray” issues but
to build toward them step-by-step.

**Modifications for Graduate Students and Biology Faculty**

Recently, the authors modified this workshop to introduce research
ethics to graduate students and faculty in Biology. While the basic
strategy of moving from Black and White to Gray ethical issues has been
kept, five modifications make this activity more appropriate for graduate
students and faculty members.
• The context of career choice has been replaced by RCR (responsible conduct of research). Faculty and graduate students are told that grant funding agencies such as the NSF and the NIH have required that research proposals in science and engineering include RCR activities. Positively, this can engender the awareness that ethics is central to the pursuit of truth in research and to the conduct of socially responsible research. Negatively, this highlights the need to develop and refine practices that avoid research misconduct.

• The modified workshop introduces concepts and values in research ethics by definition rather than exemplification. The presentation begins by laying out the definitions of four key RCR values taken from the ORI-RCR pamphlet: honesty, accuracy, efficiency, and objectivity (Steneck, 2006). These formal definitions are clarified through the discussion of a layered case, a simple scenario made complex by the addition of a series of complicating circumstances. Graduate students and science faculty have already had considerable experience with research ethics. Defining key concepts early helps them to highlight and frame this experience.

• The layered case presented after defining key RCR values introduces moral complexity and ambiguity at an earlier point in the activity. Participants discuss a brief scenario and then reexamine it as three levels of complexity are added. At the end of the presentation, participants discuss a second layered case. Moral ambiguity and controversy are introduced quickly, reinforced throughout the presentation, and revisited at the end. The goal here is not to make participants aware of moral complexity and ambiguity but to empower them to deal with these responsibly.

• Several slides explore the nuances of ethical mentoring in research. They summarize results from a survey given by one of the authors on mentoring at the Mayagüez and Ponce campuses of the University of Puerto Rico. Participants explore different styles of mentoring, the role responsibilities of mentors, and how those mentored view the different actions of their mentors. This segment argues that there are several ways to be an ethical mentor but there is also a clear difference between ethical and unethical mentoring.

• Consistent with the goal of empowering participants to deal with moral ambiguity and conflict, this revised Gray World presentation concludes with the introduction of three ethics tests to facilitate moral deliberation in the face of ambiguity and conflict. Reversibility, harm, and publicity promote moral deliberation by highlighting the
ethical dimensions of the actions under consideration. Reversibility requires that agents imaginatively project into the standpoints of those who are targeted by the action under consideration. Harm focuses on the consequences of the action and prescribes choosing actions that are harm-minimizing. In a publicity test, the agent deliberates on whether he or she would accept being publicly associated with a given action. These tests are introduced following the presentation of the second layered case and help structure its discussion (Davis, 1999; Cruz & Frey, 2003).

This modified workshop explores issues important to those already experienced in scientific and engineering research. Participants still move from the black and white to the gray but they do so more quickly and play a more active role in developing strategies for responding to moral ambiguity and conflict. The Gray World presentation has been expanded and modified to focus on framing moral ambiguity and conflict, on shaping and bringing to clarity prior experiences of this, on eliciting from participants suggestions for facing ambiguity and conflict, and on developing best practices that “strive for clarity and agreement insofar as it is reasonably attainable.”

**BRINGING IN MORAL AMBIGUITY AND DISAGREEMENT**

Moral ambiguity in research practice arises out of complex and ill-structured situations (Rest et al., 1999). Moral disagreement results from the plurality of participatory perspectives, the diverging interests of stakeholders, and the constructive role that imagination plays in reasoning and in conceptual development. For example, Martin Benjamin quotes Rawls on the origins of moral disagreement in the following:

"Diversity naturally arises from our limited powers and distinct perspectives; it is unrealistic to suppose that all our differences are rooted in ignorance and perversity, or else in the rivalries that result from scarcity....Deep and unresolvable differences on matters of fundamental significance...[must be acknowledged] as a permanent condition of human life (Benjamin quoting Rawls, 1980)

Martin Benjamin’s “circumstances of compromise” also present unavoidable features in concrete situations that make disagreement and conflict permanent possibilities. Factual uncertainty, moral complexity, continuing cooperative relationship, decisions that cannot be deferred,
Recognized pedagogical practices can be used to help students come to grips with moral ambiguity and disagreement. **Layered cases** transition to ambiguity; they start from simple, black and white scenarios and then introduce complexity by adding circumstance and context. **Rashomon cases**, instead of presenting a case from a privileged perspective, recapitulate and organize facts using different narrative forms generated by different participatory perspectives. They show how conflict and ambiguity arise from different points of view. **Radially structured moral concepts**—concepts built around prototypical instances that extend to more complex non-prototypical instances and shade off into problematic instantiations—also help. Their radial structure makes it possible to extend the concept’s scope to cover new and complex instances; but this structure renders ambiguity unavoidable; flexibility is purchased at the expense of some precision (Johnson, 1994). These three pedagogical practices—layered cases, Rashomon cases, and radially structured moral concepts—provide the opportunity for practicing the skills involved in encountering moral ambiguity and conflict.

**TRANSITION TO THE GRAY WORLD: LAYERED CASES**

Layered cases start with a black and white scenario and introduce moral complexity by layering in complexity, conflict, plurality, and constraint. The following translates the scenario used in the variant of this workshop designed for graduate students and science faculty:

*Maria has just discovered a new, bioactive agent from a plant in a South American forest that is capable of eliminating dependence on cigarettes. When she is at the point of publishing the results, the tobacco company, FUMAMAS, offers her a one-time payment of two million dollars along with a promise of continued financial support for her research program of discovering substitutes for nicotine; in exchange she must promise not to publish the results of this initial study. If you were Maria, should you…*

a. accept this offer?
b. reject this offer?
c. accept the offer under certain conditions: __________________?
d. ask for more time?
Students discuss the core scenario and identify the ethical issues it poses. For example, the core scenario outlines a conflict between the imperative that scientists share their research results (Shamoo, 2003) and the lure of private, financial gain. Further discussion flows from layering on the following circumstances:

- **Her thesis advisor tells her that if she publishes, this will conclude her thesis work and she will be able to graduate this semester.** (The decision must now take into account career development along with the conflicting elements of sharing research results and pursuing private financial gain.)
- **At the same time she receives the FUMAMAS offer, her thesis advisor tells her that she has to publish immediately the results of her study or she will not graduate.** (The conflict between financial gain and career development becomes sharper when the thesis advisor issues a “now-or-never” ultimatum.)
- **At the same time she receives the FUMAMAS offer, her mother and father have an automobile accident. They are now in the hospital in critical condition. Because they do not have adequate health insurance, they are facing astronomical costs for surgeries and rehabilitation.** (Maria’s obligations to her family come into conflict with her professional obligation to advance knowledge and publicize research results.)

Layered cases move from the simple to the complex by adding on or layering in additional circumstances. Judicious choices concerning what to add can provide opportunities to practice problem-solving skills. For example, students can practice implementing ethical solutions in highly constrained situations. (The above case shows how a simple but tragic turn of events—the parents’ accident and the high cost of medical care—poses powerful constraints on how—or even whether—Maria can realize her duties as a researcher.) Layering in conflicting goods can also give students practice prioritizing, weighing, and integrating competing moral and non-moral concerns.

**TRANSITION TO THE GRAY WORLD: RASHOMON CASES**

Patricia Werhane uses Akiru Kurosawa’s movie, *Rashomon*, to practice examining an issue from multiple perspectives, an important element of moral imagination (Werhane, 1999). *Rashomon* dramatizes a confrontation between a bandit and a samurai through four inconsistent participant testimonies. It is left up to the viewer to work through the contradictions in order to provide a consistent narrative of what
happened. Participatory perspectives are partial and selective; they filter according to interest. A Rashomon case, then, explores an ethical issue through several participatory perspectives instead of just one master narrative. Students are divided into groups each of which analyzes and dramatizes a participant perspective. Then they act out their dramas, exploring the situation from their assigned participatory perspective and listen as their peers act out different perspectives. Just as a historian examines, compares, and criticizes conflicting witnesses and evidence, so do students work through a Rashomon case by carefully comparing and criticizing the different, conflicting participatory perspectives.

By systematically exploring a source of moral conflict (conflicting participant narratives), Rashomon cases directly target objective five of the Hastings Center Report. An example of such a case is the Swift case provided by a research ethics team from Oklahoma State University.

Alyssa, after Dr. Swift's negative evaluation of her work, decides to work with another research group. But she leaves her notebook and data summaries which are quickly integrated into the projects of other graduate students working under Dr. Swift's supervision. This material is synthesized into a publication authored by Dr. Swift and these other graduate students. Alyssa finds out and asks why she is not included as coauthor. Upon receiving an unsatisfactory reply, she files a formal complaint that triggers an investigation during which the following individuals give testimonies: Alyssa, Dr. Swift, Michael (a grad student working in Dr. Swift's lab group), Rachael (Alyssa's roommate), and a representative of the University's Research Ethics Committee.

Students divide into groups and develop presentations for each participant. After acting out these participant testimonies, they debrief by assessing critically the multiple testimonies looking for divergences and convergences. They also examine how each perspective (along with its constitutive interests, rights, duties, and responsibilities) structures the narrative embedded in each participant's testimony. This activity develops what moral psychologists call “role taking”; students learn to project themselves into the perspectives of others and to explore situations, circumstances, and actions from these distinct standpoints (Lapsley, 1996).
TRANSITION TO THE GRAY WORLD: LEARNING CONCEPTS BY PROTOTYPING

Reflecting on the Gray World shows how moral concepts need to be studied in context. Moral concepts are different than their counterparts in science and mathematics; instances are drawn together through their “family resemblances” rather than through exact definitions that list necessary and sufficient characteristics. Mark Johnson, reporting on discoveries in psychology, linguistics, and anthropology about concept acquisition, provides the following summary of the radial structure of concepts:

“most categories [and concepts] used by people are not actually definable by a list of features. Instead, people tend to define categories (e.g., bird) by identifying certain prototypical members of the category (e.g., robin) and they recognize other non-prototypical members (e.g., chicken, ostrich, penguin) that differ in various ways from the prototypical ones. There is seldom any set of necessary and sufficient features possessed by all members of the category. In this way our ordinary concepts are not uniformly or homogeneously structured.” (Johnson, 1994, pp. 8-9)

The “radial” structure exhibited by moral and empirical concepts “prototypical instances…surrounded by non-prototypical instances…and fading off into borderline cases” (Johnson, 1994, p. 97) renders these less exact than geometrical concepts and awkward to use in a strictly deductive approach to moral reasoning. But radial concepts make up for this by being flexible as well as extendable to new or unfamiliar instances.

The Gray World presentation uses two strategies to convey this important insight. First, students are shown a picture that at a first glance appears to be a snake. But this initial glance lacks background and context. When context is added the menacing snake turns into a harmless caterpillar. This shows that concepts must be understood in and through a broader, underlying context. Second, students are shown pictures of prototypical birds. Because these have wings and fly, it would appear that all birds have wings and fly. Then a non-prototypical instance is added; an ostrich is a bird and has wings but does not fly. Non-prototypical instances of concepts are linked to prototypes, less by lists of necessary and sufficient conditions, and more by “family resemblances” (Lakoff, 1986). These two examples reveal the radial structure of some empirical and moral concepts. This targets moral ambiguity because it generates awareness that empirical and moral concepts are not as exact as their counterparts in math and science. In the Gray World, flexibility (the
imaginative extension of moral concepts to include new instances) is traded off with precision. The proper antidote to moral ambiguity is not a retreat to certainty but embracing the fact that moral concepts are metaphorically and imaginatively constructed (Johnson, 1994).

ASSESSMENT STRATEGIES

The thirteen workshops (held between 2007 and 2009) have reached 352 pre-university students. The assessment strategies employed and general summaries of their results will be described in this section. Further information has been published in an EAC (Ethics Across the Curriculum) Toolkit (NSF 0551779) module published in Connexions (Frey, 2011).

Workshop assessment begins with a short test the students took before and after the activity. The pre-test identifies students’ initial perceptions on different issues pertaining to research ethics. The post-test, the same test taken after the completion of the workshop, gives a rough estimate of improvements brought about by the workshop experience; correct student responses before the workshop are compared to those after its completion. Some groups gained more knowledge than others. But higher pre-test scores show that this was because they had more background knowledge of these issues and brought this into the workshop. This attested to the experience of workshop organizers that students come to the university with very different levels of preparation in science and engineering, including ethical issues arising in these areas. In short, variations in improvements brought about by the workshop stem from the varying levels of preparation prior to the workshop rather than from weaknesses in the assessment activities carried out by this project.

To make this even clearer, workshop organizers triangulated assessment activities, that is, they used different assessment strategies to validate assessment results. Validated results emerged as those upon which the different assessment activities converged. The pre- and post-test format relied primarily on closed, multiple-choice questions. The first part, those examining a student’s understanding of basic ethical issues and concepts, consisted of questions stating a position followed by “agree,” “disagree,” and “don’t know.” This concerned issues such as the relation of ethics to morality and the relativity or absoluteness of ethical principles (Ferrer, 2007). The second section consisted of a question asking for a description of a basic concept in research ethics followed by
different options. Students choose the option that best fits the concept. This tested student knowledge of issues like plagiarism, falsification, fabrication, mentoring, environmental responsibility, and conflict of interest. A third section consisted of an open-ended essay question having students define ethics and describe its importance. This was assessed using a rubric. Finally, students were provided with a short case to which they responded by assessing two decision possibilities.

Quantitative and qualitative assessment activities were used to provide a well-rounded account of the initial perception and acquired knowledge of different ethical issues. The outcomes assessed by all three activities have been formulated as Bloom-type skills: associating the concept of freedom with humanness, distinguishing (not separating) the ethical and the moral, defining ethics and describing its importance, identifying instances of relative and absolute norms, defining the significance of research ethics concepts like plagiarism, and associating ethics with the protection of the environment and the treatment of animals and humans in scientific research. Informal assessments were also based on how well students framed and discussed the gray case set forth at the end of the presentation. This represents a remarkably comprehensive assessment process given the severe time constraints placed on workshop organizers. For example, when the workshop team visited a local school, they typically had fifty minutes to give the presentation, show the videos, carry out the pre-test, and conclude with the post-test and other evaluation activities.

RESULTS

Workshop organizers are still analyzing assessment data as this project has closed out. But preliminary results show substantial improvement. Three hundred and fifty students have participated in workshops delivered at twelve schools or camps. All instances show considerable improvement in perception and knowledge. Improvements in perception range from a low of 16% to a high of 33% while those in knowledge range from a low of 7% to a high of 26%. Both lows occurred in schools where students came to the workshop with considerable advance preparation. Consequently, less perception and knowledge was gained because students were better prepared to begin with. Students and their teachers were also asked to comment on their perception of the value of the workshop; in all instances they enthusiastically affirmed its
value as an educative experience (A table showing assessment results can be found at Frey, 2011.).

CONCLUSION

This paper has described a workshop on research ethics for pre-college students (with modifications for graduate students and science faculty) that has successfully helped students “accept the likelihood of ambiguity and disagreement on moral matters, while at the same time attempting to strive for clarity and agreement insofar as it is reasonably attainable.” (Pritchard, 1996). It employs pedagogical activities like role-playing and active learning to familiarize participants with issues in research ethics. Its product, student-produced video vignettes on different situations arising in research conduct, generates and builds upon the awareness of a substantial range of research ethics issues. Layered cases, Rashomon cases, and examples that show the radial structure of moral concepts all support pedagogical approaches that successfully move students from a black and white perception of ethical issues to a nuanced gray world view in order to empower them to confront and manage moral ambiguity and conflict.

General workshop assessment included Likert scale questions on basic ethical concepts, multiple choice questions on themes and concepts in research ethics, open-ended essay questions probing student understanding of ethics and its importance, and a final open-ended essay that used rubric-based grading to assess how well students could frame and discuss a “gray” complex ethical situation. Assessment results show substantial short term gains as students have built upon perception to acquire knowledge of these ethical issues. In all categories, 95% of the pre-college participants found the workshop to be an outstanding experience.
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NOTES

1 The articles and reports prepared through this grant can be accessed through the University of Massachusetts Amherst program, ESENCe (Ethics in Science and Engineering National Clearinghouse). http://scholarworks.umass.edu/esence/. Accessed August 17, 2011.

2 Erika C. Jaramillo and Morgan Echeverry

3 Pence defines ethics in his Dictionary of Common Philosophical Terms as “the branch of philosophy that investigates and creates theories about the nature of right and wrong, duty, obligation, freedom, virtue, and other issues where sentient beings can be harmed or helped. Sometimes contrasts with morality.” (See Pence, 19, 35) Shamoo and Resnik treat ethics and morality “interchangeably” as is consistent with the etymology of both words. (Shamoo 5, 56-59) Pritchard (1997) discusses the danger of having a workshop derailed as participants enter into the controversy of choosing a definition for ethics, for morality, and in setting forth definitively the relation and difference between these two terms.


5 This case was originally prepared through the Association for Practical and Professional Ethics workshop on Graduate Research Ethics from NSF Grant No., SBR 9421897. It can be found in its original form at the Online Ethics Center website: “To Be or Not to Be Included” Online Ethics Center for Engineering 4/18/2006 National Academy of Engineering Accessed: Monday,
The University of Oklahoma Center for Applied Social Research converted this case into a Rashomon case in a workshop given at UPRM in May, 2007. The authors have further modified it and have used it in research ethics activities at UPRM.

A familiar exercise builds on this insight from the Gray World. In *Engineering Ethics: Concepts and Cases, 2nd ed.*, 59-64, students learn to sort out instances on a continuum bordered by positive and negative paradigms. The problematic cases are situated on the continuum in relation to the paradigms and lines are drawn depending on which paradigm—positive or negative—the problematic cases are closest to.

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