Rethinking the Meaning of Ethics in RCR Education

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Training in the responsible conduct of research (RCR) is meant to ensure that federally funded scientists have the knowledge, skills, and resources necessary to conduct science in line with agreed upon scientific norms and ethical principles. At its institutional best, RCR education begins early, with reinforcement in subsequent stages of career development. Studies suggest, however, that scientists perceive the push to think about ethical matters negatively, narrowly equating ethics with burdensome oversight and regulation, or with controversies in a few highly charged areas. For their part, RCR instructors contribute to this narrow conception of ethics education by placing disproportionate emphasis on the misconduct of the few and its career-destroying consequences. The result is an ethics that is both individualistic and uncritical, an ethics incapable of explaining the threat to scientific integrity posed by a rigidly hierarchical distribution of power, severe competition for funding, a “winner takes all” credit system, and many other features of ordinary science. What is needed is a broader, richer conception of ethics, one that focuses not only on individual instances of misconduct, but also on the growing gap between the normative ideals of science and its institutional reward systems.

When the editors of this Special Issue solicited my contribution, they suggested the title “What’s philosophy got to do with it?”—the “it” being science. The proposal seemed natural enough for someone, like myself, with a Ph.D. in philosophy, who has spent much of her career in a philosophy department. What philosophy has to do with this or that subject—or indeed with anything at all—is a skeptical question that most of my philosophical colleagues and I frequently face. Similar questions arise from colleagues in the medical school and health science departments where, for the past decade, I have taught courses and provided training in clinical and research ethics (RCR). In this setting, philosophy takes the form of ethics, more specifically, professional ethics related to various fields of scientific and medical research. The question “What does ethics have to do with science?” demands a compelling answer. Without one, those tasked with teaching research ethics likely condemn themselves, like Sisyphus, to rolling the same rocks up the same hills, only to have them roll down again.

In what follows, I’d like to argue for a two-part thesis. The first claim is that the conception of ethics on offer in research ethics training is too narrow. This makes it easy for scientists to dismiss the relevance of ethics to what they do everyday. The second, related, claim is that we need a broader conception of ethics, one that allows a rethinking of the role of ethics in RCR in ways that make it more relevant to the scientific research community. I want to describe what this broader, richer conception of ethics might look like and how it might allow us to examine the norms and institutional structures of science itself. It is my contention that unless and until RCR turns its attention here, it will continue to face challenges to its relevance.

Let me begin with a few observations about the current situation in RCR. In particular, I want to review what we know about how scientists think about ethics and how those charged with teaching research ethics understand their task.

As is well known, the move to require RCR training began in 1989. The aim was to ensure that federally funded scientists have the knowledge, skills, and resources necessary to conduct research in line with agreed upon scientific norms and ethical principles “in the performance of all activities related to scientific research” (5). Since then, other federal agencies, such as the National Science Foundation, and U.S. research institutions have come to see education and oversight in the ethical dimension of scientific research as an essential part of scientific training and research (6).

How are these requirements being implemented? At first glance, things seem pretty good. Recent studies suggest that the majority of research institutions in the U.S. go beyond federal requirements, mandating RCR instruction for all graduate students or all recipients of grant support. However, the implementation of these requirements is often superficial and lacks depth, focusing more on compliance than on critical thinking and ethical decision-making.

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(8, 9). At UCSD, for example, RCR is now widely required not only for those on training grants, but also as part of undergraduate research programs, graduate program orientations, clinical research training, and work in stem cell research. Research ethics is strongly encouraged in a variety of other settings, including in postdoctoral career development. Here, as elsewhere nationally, RCR instruction is typically organized around texts such as Frank Macrina’s *Scientific Integrity* (3), which includes detailed case studies, and on-line resources written by scientists and experienced research ethicists. At its institutional best, then, RCR education begins early, with reinforcement in subsequent stages of career development. For a few, mandated programs may result in an independent interest in RCR, including training as an RCR instructor, participating in research, and joining professional organizations such as The Association of Practical and Professional Ethics (APPE).

For the vast majority, however, RCR and the ethical dimensions of research remain peripheral, overshadowed by the daily demands of lab work, grant writing, and publication. The scientific community has grudgingly accepted oversight and regulation by Institutional Review Boards (IRBs), Institutional Animal Care and Use Committees (IACUCs), and Data Safety and Monitoring Boards (DSMBs), but the idea that professional training should include anything beyond meeting legal or funding requirements still meets with considerable resistance. The discussion of “gray areas” such as authorship (e.g., the fair assignment of first authorship) or conflicts of interest (e.g., peer review in fields with a small number of suitable experts) risks raising the hackles of those trained to expect data-driven answers and clear resolutions. As an exasperated senior scientist asked years ago: “Can’t you just write up a list of do’s and don’ts—a Ten Commandments of research ethics?” However unrealistic, the desire for such simplicity is hardly unusual—or difficult to understand.

Turning from anecdote to data, studies support the observation that many scientists see ethics as irrelevant to the ends of science. In a few areas, such as research with the Avian flu virus or new “three parent” reproductive methods, scientists may find it difficult to avoid media scrutiny or public discussion of the implications of their work. But most, as Robert Paul Wolpe observes, are reluctant to think about the ethical dimensions of science (12). Why?

A detailed explanation emerges in a 2012 paper based on a qualitative and quantitative study of graduate students, postdoctoral fellows, faculty, and clinical instructors and research staff at biomedical research institutions in the life sciences by McCormick, Boyce, Ladd, and Cho (4). Using data drawn from focus groups, telephone interviews, and a national survey with over 850 respondents, they identified four “barriers” to scientists thinking about the social and ethical implications of their work. One barrier is an absence of awareness. Scientists either thought their research lacked social and moral implications altogether, e.g., “I work with zebra fish,” or believed ethical problems arose only rarely in science and mainly in controversial fields such as embryonic stem cell research. A second, related, barrier is that many scientists do not see the connection between scientific work and broader social issues, e.g., how better imaging tools such as MRIs may result clinically in more false positives, unnecessary interventions, and higher medical costs. Given how specialized undergraduate education in science and technology has become, it is perhaps not surprising that scientists would lack the ability to identify the ethical dimensions of their work. Even those who have had undergraduate courses in ethics, philosophy, or other humanities, are (re) trained to see the sciences as a value-free domain ruled by objective assessment of data.

Despite (or because of) their lack of awareness of ethical issues and the social consequences of scientific research, many scientists in McCormick’s study exhibited a remarkably strong sense of confidence regarding their ability to deal with ethical challenges. Over a third of their national sample saw themselves as fully capable of dealing with any ethical or societal issues that might arise “on [their] own” (4). This “overwhelming sense of confidence,” emerged more prominently among graduate students, perhaps due to faith in troubleshooting capacities honed during long days at the bench. Others acknowledged the limits of their own capacities to resolve ethical issues and appreciation for outside experts (4). But among at least some scientists, over-confidence in the ability to handle ethical problems “on the spot” emerges as a third barrier to thinking in advance or abstractly about potential ethical problems. The tendency to focus on the immediate may also explain the general reluctance to think about the down-the-road social responsibilities of scientists, e.g., the privacy implications of genetics or the impact of new, but unaffordable, cancer drugs.

Lastly, and most provocatively, McCormick’s study found evidence that scientists see reflection on the ethical dimensions of research as at odds with “the daily practice of science” (4). How so? For one thing, the obligation to think about broad social concerns added to the heavy responsibilities with which scientists are already burdened. Many of those surveyed also feared that engaging in reflection on such concerns, particularly with outsiders such as IRB members or ethicists, would slow down, or lead to interference with, their scientific work and thus not be in the scientist’s best interest. Others worried about raising issues with senior scientists who might not share their questions or reservations.

Overall, then, scientists are hostile to the push to think about ethical matters. Ethics is equated with regulations, a growing burden, or with controversies in a few highly charged areas. McCormick and her team conclude that we should not be surprised to find that scientists are reluctant to take time or otherwise expend resources for RCR education either for themselves or their trainees (4).

For their part, RCR instructors have noted these realities and adopted a narrow conception of ethics. The
conception is narrow in that it places emphasis on the misconduct of the few (and its career-destroying consequences) rather than the ordinary behavior of the many. High-profile cases such as that of the Duke University cancer researcher, Anil Potti, or the South Korean stem cell biologist, Hwang Woo-Suk, can reveal a great deal about the harms of misconduct. Such tales of crime and punishment certainly engage the interest of students, testifying to the real risks misconduct poses for a career in science. My own experience, however, is that students, often curious about what happens to “the disgraced and dismissed,” and armed with the investigative tools of the Internet, easily discover that such miscreants continue to run labs or practice medicine (albeit in far off states such as North Dakota). Consequently, the lessons of concentrating on misconduct may be other than intended.

More significantly, a growing body of research suggests the limitations of this “bad apple” approach. Barbara K. Redman’s study of research misconduct policy, for example, points to how efforts centered on identifying and punishing fabrication, falsification, and plagiarism do little to address the conditions that lead to such behavior in the first place (7). This is certainly correct, a point I develop below. This approach may also create the misguided impression that it is only falsification, fabrication, or plagiarism—the so-called “Big 3” of federally defined research misconduct—that “counts.” The work of Patricia Keith-Spiegel, Joan Sieber, and Gerald P. Koocher usefully points to the importance of addressing a wider range of scientific behavior. They identify seven categories of irresponsible or unethical acts, “committed purposely, negligently or unintentionally” that RCR discussions often overlook. Their User-Friendly Guide calls attention to the importance of everyday features of lab culture, such as the poorly kept lab notebook and inadequate training, and encourages individuals to raise questions about departures from best practices (2). The emphasis on misconduct, however, risks the equation of ethics with the “ethics police.”

Philosophically, it is worth noting two other features of this narrow conception of ethics. It is both individualistic and uncritical. It is individualistic in taking the single agent, the scientist, apart from his or her relationships (with colleagues, students, funding sources, competitors, family members, the public), as the object of attention. J fails to report dropped data points in a manuscript prepared for submission. Y enrolls research subjects that “don’t quite” meet the study criteria. Such case studies help trainees see that J and Y are departing from expected standards of research integrity. But in limiting ethics to the evaluation of individual actions, this approach to RCR avoids identifying the systemic, institutional norms and reward systems of science itself. It holds J and Y responsible for their actions, but provides no analysis of the power dynamics of graduate or postdoctoral training or the hidden curriculum that rewards “doing what it takes” to produce results and produce them quickly.

In this sense, the ethics on offer is uncritical. It does not criticize the actual practice of normal science. We noted above that scientists are often reluctant or unable to recognize the ethical dimensions of their work. They may be similarly ill equipped to see ordinary scientific practices through an ethical lens. Although working scientists may fail to recognize this fact, inadequate mentoring, cherry-picking statistical methods, regular inattention to safety regulations, or an insistence on unrealistic deadlines are ethical issues. They are forms of what N. H. Steneck labels “questionable research practices” that remain under the ethical radar (11). Trainees who report struggling to “get along” or keep up in toxic labs are often advised by their peers that raising questions will get them nowhere. Their best hope, they are instructed, is to “hang on, become a PI and then they can do things their way.”

Where does this leave us? My own sense—and I’m sure I’m not alone in this—is that RCR faces a predicament. It is not, as critics charge, that we have failed to eliminate research misconduct. Of course we have not eradicated all misconduct. Such hoped for control over scientific behavior casts RCR (and its instructors) in a role that no one could play. The predicament facing RCR is rather that we have failed to address the gap between the normative ideals of science and science’s institutional reward system (7). Science asks for collaboration and openness, but instead rewards competition and “getting there first.” Science demands the objectivity of double-blind research, but accepts a peer review process open to the effects of reputation and established professional relationships. Professing open competition and meritocracy, science does little to teach scientists to acknowledge or manage their own biases, despite plenty of evidence of discriminatory hiring and promotion practices in STEM fields (10). Assumptions about gender, ethnicity, and race go unexamined despite repeated national calls to encourage women and underrepresented minorities to enter—and remain in—fields such as chemistry, physics, or math.

Calling for attention to the institutional underpinnings of scientific integrity is not new. More than a decade ago, the Institute of Medicine (IOM) noted this connection.

The extent to which the organization is highly competitive, along with the extent to which its rewards (e.g., funding, recognition, access to quality trainees, and power and influence over others) are based on extramural funding and short-term research production, may have negative impacts on integrity in research. (I)

Classroom efforts to talk about the role of severe, institutionalized competition in encouraging misconduct, of the sort the IOM report and Redman’s critique of current research misconduct policy advocate, are frequently met with the response that this is “just the way things are.” Those who want a career in science, particularly in the higher
reaches of research, learn to put their heads down and do what it takes to succeed in the current system. They are uncritical. The critical thinking so evident in journal clubs and professional conferences does not extend to discussion of the fiercely hierarchical structure of science, its contradictory norms, or the conflicts of interest inherent in rewarding only “positive results.” It does not extend to the actual practices of science.

A broader conception of ethics is needed that would include reflection on these matters and encourage scientists to consider not only the ethical and social consequences of their work, but also the ways in which lab culture and institutional reward structures may themselves undermine objectivity and rigor. Awareness of the power structures in science may help empower individuals, particularly early career scientists (or the self-described “lowly postdoc”), to see themselves as professionals with a role in making policy and altering existing practices, such as “winner take all” credit structures, widely acknowledged to negatively impact research integrity.

Expanding the ethical charge of RCR thus may pose problems for instructors whose own work depends on collegial relationships with scientist colleagues and university administrators. Senior scientists may not welcome criticism of existing norms and practices. Raising awareness of unreasonable expectations or inadequate mentoring may make life difficult for junior researchers. Nonetheless, a broader, more critical conception of ethics is necessary if RCR is not to ignore the growing gulf between the ideals of science and its practice.

The point is not to deny that the majority of individuals engaged in scientific research do good work but to indicate that there is a problem in the profession of science itself. In a well-functioning profession, the reward systems and normative ideals align. The real threat to ethical conduct in science lies here—in the tension between the existing reward systems and the norms of science. This is something that RCR needs to recognize and come to terms with. To this end, the broader conception of ethics outlined above—with its critical reflection on institutions and ordinary practices—may be of some use.

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REFERENCES