Developing a Well Reasoned Response to a
Moral Problem in Scientific Research

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Introduction

Every day you make decisions about what to do. Some decisions are just matters of preference that have no moral implications, like whether you would rather wear a red or green sweater, or whether you would prefer an apple to an orange. Even technical questions, such as whether to use a flask or a beaker, or a pair of pliers or a wrench to accomplish a given task, may be simply matters of preference. However, when the exercise of preference somehow affects the welfare of others, moral questions arise. One of the problems for persons entering a profession, such as science, is that they may not recognize when choices about technical matters have moral implications. One purpose of instruction in research ethics is to alert future professionals to such situations.

In most cases, when moral questions arise, you do not wonder what you should do. You clearly know what you ought to do - even though you may feel compelling pressures not to follow through and do it. You may question whether you can escape the consequences of not following through, but you do not question what is right. As an educated person, you rely on knowledge of existing laws or even intuition to tell you what to do, without necessarily reflecting on why a given act is right or wrong. As law-abiding citizens, we recognize that we can be held accountable for our actions and that even ignorance of an existing rule or law does not exempt us from its consequences, should we break it. For the most part, each of us functions pretty well without giving much thought to the reasons a particular act, such as stealing or cheating, is wrong. Knowing the rules and laws is essential for maintaining a law-oriented society, but reflecting on the reasons for those rules and laws may not be.

However, there are some situations and contexts in which a well-developed ability to reflect on moral issues and to undertake ethical reasoning is crucial. For professionals in science, as well as in other fields, skills of moral reflection are important - perhaps even essential - because new moral problems arise as technology advances, as societal expectations change, and as the various scientific disciplines evolve. Sometimes professionals face moral problems that were not anticipated by the profession's existing codes of conduct and are not explicitly stated in laws and/or procedural rules. Yet case law shows that professionals can be held accountable for their decisions. Professionals are expected responsibly and knowledgeably to apply moral principles to arrive at morally defensible positions - even on novel and unprecedented issues.

If we think that the work of professional scientists is important and that they should be held accountable for actions that affect the welfare of others, we must ask what values and norms underlie the practice of science, and by what standards professional practice should be judged. Professions, including scientific professions, differ in the extent to which they have made explicit the norms and values that govern professional practice. Some professions, such as engineering, law, medicine, dentistry, and psychotherapy, have explicit codes of conduct, describing how the profession's ideals
translate into specific expectations and obligations. Scientific societies (with the possible exception of medical science) tend to simply set forth the organization’s aspirations or ideals. For instance, in science, rather than speaking of professional obligations, professionals refer to traditions or norms of practice. In its report, the National Academy of Sciences Panel on Scientific Responsibility and the Conduct of Research observes that:

The community of scientists is bound by a set of values, traditions, and standards that embody honesty, integrity, objectivity, and collegiality. These values are reflected in the particular principles and practices characteristic of specific scientific disciplines.

Scientists need practice in how to apply these values when formulating a response to one of the practical ethical problems that frequently arise in the course of doing and presenting scientific research. Some research indicates that skills of ethical reasoning are also a necessary condition for excellence in practical problem solving.

For these reasons, we have concluded that training in decision making for young scientists should devote considerable effort to developing and strengthening skills in ethical reasoning or reflection. In turn, each person's skills can be judged on the basis of his or her ability to develop a well-reasoned response to the kinds of moral problems scientists encounter in professional life.

**Judging responses to moral problems.**

How does one decide whether a response is well-reasoned? What criteria apply? Can the adequacy of a response to a moral problem be reliably judged? These are questions of concern to students in an ethics course. Responses can be judged based on these criteria:

(A) Whether the response addresses each of the issues and points of ethical conflict presented in the case or problem;
(B) Whether each interested party's legitimate expectations are considered;
(C) Whether the consequences of acting are recognized, specifically described (not just generally mentioned), and incorporated into the decision; and
(D) Whether each of the duties or obligations of the protagonist are described and grounded in moral considerations.

These are the criteria generally used to evaluate the adequacy of responses to ethical problems. Persons with training in ethical analysis can reliably rate and rank the adequacy of the arguments for a chosen response. The purpose of this paper is to help you understand the criteria for judging the adequacy of moral arguments so you can develop a strong argument in defense of your position on the problem presented to you.

**Applying the criteria**

The following are some suggestions to help you apply these criteria as you analyze an ethically problematic situation and formulate a reasoned response.

1. **Issues or points of conflict.** To provide a convincing ethical analysis, you will want to move beyond naming the issue (e.g., data ownership and access, plagiarism, etc.) to describing the nature of the moral conflict. What constitutes an ethical conflict? A dilemma, by definition, is a situation in
which rights or obligations of interested parties conflict. For example, there's a famous hypothetical case called "Heinz and the Drug." The scenario is this:

Heinz's wife is dying. A cure is available from a druggist in Heinz's town, who is the one who discovered the drug, but the druggist charges much more for the drug than it costs him to make it, and much more than Heinz can afford to pay. Heinz can't raise the money and the druggist will not agree to let him pay later.

The dilemma is whether Heinz should steal the drug to save his wife's life. One issue in this case has to do with property (whether the druggist's right to his property should be respected), and another has to do with life (whether Heinz is obliged to act to preserve his wife's life). When we examine the case in terms of conflicting rights, Heinz's wife's right to her life is in conflict with the druggist's right to his property. Heinz tried to resolve the problem without compromising either the druggist's or his wife's rights and was unsuccessful. He exhausted his ability to resolve the problem and is considering which of his conflicting obligations (to save his wife's life or to respect the druggist's property) should take precedence.

Real-life dilemmas often present choices between equally unfavorable or disagreeable alternatives. Consider the case of the researcher considering data enhancement of preliminary findings to assure continued funding for his research lab. He sees a conflict between his obligation to report his data honestly and his obligation to secure enough funds to keep his lab technicians employed. You might reason that honesty is a more important consideration than maintaining jobs for lab technicians, but such practical considerations can influence professional judgment.

Note that identifying the points of ethical conflict is often one of the hardest jobs in ethical analysis. Most people find it easier to begin by considering interested parties, consequences, and obligations before trying to describe the issues more fully.

2. Interested parties. Skills in perspective-taking are called for by this criterion. Other parties, besides those directly mentioned in the case, may have a stake in the protagonist's decision. You might think of interested parties in progressively larger groupings, from the person facing the ethical problem, to the person(s) immediately affected (such as that person's students, teachers, or research subjects), to the people in the relevant institution (the laboratory or university), to the scientific community and society in general. Consider the reasonable expectations (rights) of each interested party. Frequently, consideration of the interested parties will bring more issues to mind.

3. Consequences. For each action considered, there are often several possible outcomes. The challenge in identifying consequences is not to identify every remote consequence, but to identify those that have a good probability of occurring, or those that would have very serious consequences even if the probability of occurrence is not particularly high. For example, the possibility that someone might die due to the release of a small amount of a toxic substance during an experimental procedure may be relatively remote, but the consequences would be so devastating that the potential benefit may not even be worth a remote risk.

When considering consequences, be sure to consider, in turn, each of the interested parties and the probable consequences of the proposed action on those parties. When considering consequences to the protagonist, keep in mind that consequences may be multifaceted. On the one hand, he or she might get caught in an unethical act and face a lawsuit, loss of funding, loss of reputation, or other serious negative consequences. On the other hand, he or she may get away with an
unethical act and get a publication or grant more easily and quickly than if he or she had acted ethically. But whether or not the act is detected, engaging in actions we believe are wrong undermines our sense of integrity. The effects of an action on a person's character may appear to be minor in the short run, but often have a cumulative and debilitating effect on one's self-confidence, self-esteem, and habits - each time we reap the benefits of questionable acts and successful avoidance of the negative consequences, we enhance the probability that these acts will be repeated.

4. Obligations. For each case, consider primarily the obligations of the protagonist toward the various interested parties. It is sometimes tempting to dismiss the obligation of the protagonist when some other person fails to live up to his/her moral obligation. For example, the protagonist may reason as follows:

Everyone else fudges data points, and I'm competing with them for grants, so I have to (read: am morally justified to) fudge my data, too.

One party's failure to live up to his/her moral obligations can have an impact on another party's moral obligations, but this kind of reasoning often amounts to nothing more than a rationalization - an excuse to do whatever one wanted to do in the first place - without real regard to the moral questions at hand.

When writing about the obligations of professionals such as scientists, it is not enough to say that someone has a duty to do "x." You must say why the professional has that duty. That is, you should refer to the moral justification in terms of values, principles, character, or outcomes. For example, consider the case of a researcher who is considering fabricating additional supporting data to speed publication of an exciting preliminary result that could be very important in the treatment of viral disease. In such a case, your reasoning might go something like this:

The scientist should not fabricate the data. Every scientist has a duty to report data truthfully because honesty is one of the most fundamental values of science.

When describing ethical obligations, consider the various responsibilities of scientists. One responsibility is to achieve at least the minimum standards of technical competence, and maintain those standards during the course of professional practice. For example, scientists need to know how to calibrate their instruments accurately. If you do not know how to calibrate a thermometer properly, your experiment may be completely invalid. Given the right context and consequences, lack of technical competence can become a moral issue. But even when we do know how to calibrate instruments, there are honest mistakes, such as forgetting the calibration on one particularly hectic day, or mistakenly assuming your assistant did the calibration.

Each of us is fallible. This fact of human nature gives rise to another responsibility: In addition to achieving and maintaining competence, one is expected to engage in responsible research practices, like replication, proofreading, and peer review to guard against error. Responsible research practice also includes the obligation to correct one's technical errors, as well as errors of interpretation and judgment.

In order to maintain the integrity of the research enterprise, almost every scientist will, at some point, be asked to make distinctions: on one level, between honest error and honest differences of interpretation and judgment; on another level, between negligent acts (e.g., mistakes resulting from sloppy experimentation, poor scholarship, and other forms of negligent behavior) and intentional acts
and misrepresentations, such as fabrication, falsification, or plagiarism. Scientists have a responsibility to colleagues, to the research community, and to society to participate in the monitoring of research practice. This means that the professional must be knowledgeable about the process and procedures for dealing with allegations, and responsibly exercise his or her obligations to the accused and to the institution or scientific society in which the alleged misconduct is discovered.

By considering this partial listing of the responsibilities of scientists, one gains an appreciation of the complexity of moral issues that can arise in scientific practice.

**Summary**

In this paper, we have suggested that professionals, including professional scientists, have a particular responsibility to have well-developed skills of moral reasoning. We briefly set forth the following four criteria for evaluating the adequacy of a moral argument:

- Whether the response addresses each of the **ethical issues and points of ethical conflict** presented in the case or problem.
- Whether each interested party's **legitimate expectations** are considered.
- Whether the **consequences** of acting are recognized, specifically described (not just generally mentioned), and incorporated into the decision.
- Whether each of the **obligations or duties** of the protagonist are described and whether the obligations are grounded in moral considerations.