



Why the Topic of Bioethics in Science Classes?

A New Look at an Old Debate

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Definitions of some key terms...

Ethics is a discipline which attempts to examine and understand ways in which choices are made involving issues of right and wrong. The field of ethics uses the "raw material" of moral discussions to define two approaches which are (1) descriptive and (2) prescriptive. Descriptive ethics is concerned with examining and analyzing the reasons people give for moral beliefs and behavior in different cultures. This documentation describes the language and reasoning processes which are used by a particular group or individual to distinguish right from wrong. Prescriptive or normative ethics deals with what "ought" to be rather than what "is" giving reasons which are open to public scrutiny. What "ought" to be reflects the highest vision for conduct which is not only morally acceptable, but morally best. It is a search for authoritative standards which govern moral choices. Both of these components, which lack sharp distinctions, involve a definition of ethics requiring reflection about moral conventions and reasoning.

Some philosophers argue that moral principles cannot be proven, that there are no moral truths, and moral behavior is not a rational subject. This is a form of philosophical skepticism. One of the most familiar forms of skepticism is relativism, which states that there is no one correct moral code for all times and peoples, that moral codes are relative to a culture or group. **No effort will be made to address the issue of a common morality. The purpose of this paper is to examine different views of how knowledge and reasoning skills may be acquired, not to be prescriptive of ethical norms or moral values.**

Bioethics, a branch of ethics, deals with moral problems in medicine and the life sciences. Physicians, patients and families seek guidelines to assist them in finding solutions to questions about quality of life issues. Numerous factors generate conflicts outside of the field of medicine - technology, economics, the law, new diseases like HIV and sociological and demographic changes.

In common terms, **morality** is the day-to-day practice of a group's or individual's view of what is perceived to be highest "good". The definition of "good" is variable across groups and societies. Cultural, religious, gender, and even generational differences function as lenses through which reality is filtered. They prevail in defining the vision of what is "good" behavior. These differences give rise to views such as those espoused in Christian, Kantian, Victorian moralities to name but a few. The practice of selecting the action which best exemplifies this vision might be thought of as one of identifying the societal conventions about right and wrong conduct. **Integrity** is the consistency with which one's behavior, day-in and day-out, reflects an attempt to express that individual's or group's view for what is "good" when faced with a moral conflict.



A problem becomes a **moral conflict** when a choice must be made and the consequences are painful, no matter which course of action is chosen. **Moral behavior** can be thought of as an expression of an individual's or group's interpretation of what is an acceptable choice. For example, our ability to resolve a conflict is tested when the decision involves more than a factual debate. A young woman suffers a massive stroke and can be kept breathing only with the assistance of a ventilator. The decision to shut-off the ventilator may be intellectually and medically straightforward; however, the emotional conflicts make the choice anything but easy. Why? Values, often deeply held and defended, influence the final choice made. When these values point towards opposing actions, they become a source of conflict and anxiety. The debate may be within oneself, with others, or society at large. **Ethical theories** can help define and clarify the process whereby individuals search for a rationale to support a particular course of action. In the final analysis, ethics or moral psychology is a field which studies how one person makes a difficult, personal choice at a particular moment in life.



What Techniques Are Helpful In Developing Moral Problem Solving Skills?

One method of approaching the topic of conflict resolution is to engage students in dialogue around a moral problem whose content is a part of regular course work. The process of problem solving involves critical thinking (<http://www.gene.com/ae/21st/TL/buchanan/>) skills which cannot be effectively taught in the absence of meaningful content.

In general, the solution to a problem will involve balancing and prioritizing several competing values. Moral principles can be thought of as a set of rational "equations" which attempt to sort conflicting values by assigning a higher priority to one over the other. Principles are like a scale which allows us to give weight to the pros and cons of different courses of action. Justification for these principles hinges on one of several ethical systems. Courses of action, which result from this balancing act, often end up being less complicated and difficult than the actual evaluation process.

One profession's approach

Moral problems in medicine have long posed real-life tests of how well some theoretical principles are able to assist physicians in making responsible decisions, which may have legal and moral consequences. Bioethics and medical ethics are fields of study composed of experts using a multi-disciplinary approach to analyze possible choices from differing points of view in complicated cases. A professional code for ethical behavior, which has roots in western civilization, helps justify difficult courses of action. Health providers are guided by the following four ethical principles, which are key components to their professional ethics codes. We can also find these principles represented in the Constitution, court decisions, and in cultural and religious traditions. [\(See biblio.4\)](#) From the medical code of ethics, actions taken by health professionals must [\(See biblio.2\)](#):

1. Benefit the patient - life is sacrosanct (*beneficence*).
2. Do no harm unless balanced by the hope for improvement (*non-maleficence*).
3. Result in an even handed allocation of scarce resources- characterized by fairness (*justice*).
4. Respect others as equal partners in making a decision (*autonomy*).



What Are The Origins For The Principles Guiding Physicians?

The origins of these four principles governing physician-patient relationships can be traced initially to Hippocrates - the basis of the Hippocratic oath. Early on, physicians were limited in their skills and options in treating patients. The first premise for the physician was to "do no harm" to the patient. As medical knowledge advanced, the capacity to actually benefit the patient became a reality. These two ideas formed the chief guiding principles until the mid- twentieth century. Physicians were largely torn between doing what was good for the patient while balancing this against the risks of potential harm. For instance, the administration of antibiotics may shorten the illness, but carries with it the risk of developing resistant organisms. There are trade-offs. If the benefits are minimal, then harmful risks carry more weight.

Autonomy, which requires the patient be treated as a self-determining agent, is related to informed consent and places the patient in a collaborative role with the physician. This guiding principle became more prominent after World War II and the atrocities documented in the Nuremberg Trials.

Lastly, the principle of justice, viewed as one of equality, became a factor in the early 1980s when changes in medical insurance plans were implemented. The costs of medical malpractice and health insurance premiums were climbing as physicians felt ever increasing pressure to perform tests on patients to provide sufficient documentation for illness or injury in the event of a lawsuit. To place a cap on medical costs, a system of reimbursement was introduced by the federal government. Hospitals were reimbursed for Medicare patients based on average costs rather than actual expenses. This had the effect of limiting the requests for expensive procedures as a cost containment process.



Factors Influencing The Way In Which Decisions Are Made:

Looking at all sides of a conflict is not an easy task. Several factors, which we may not be aware of, contribute to our understanding (or misunderstanding) and hence, influence the final choice. Consequently, people involved in the same conflict may arrive at different solutions caused by any of the following:

- **Context** the circumstances surrounding the issue, influences what parts are thought important or unimportant. For instance, if the individuals in a conflict are acquainted, the nature of the relationship matters. The bond between family members is very different than the one between friends. Gender, past experiences, education and age also act as a frame, modifying how the problem and the consequences are understood.
- **Values**, which are derived from personal beliefs, are grounded in traditional sources such as family, religion and school. They form an underlying framework which focuses our attention on certain aspects of a problem and may advocate for a particular choice. Values vary from individual to individual reflecting cultural, religious and other personal experiences and may play a greater role in conflict solutions arising in situations where points of law are not in question.
- **Principles**, which are sometimes derived from external sources such as institutions or ethical theories, typically provide guidance rather than specify an action. They can assist in prioritizing values by lending greater weight to one value over another. Conflicts which involve legal issues may be solved more readily by a direct appeal to known principles. Professional codes of ethics and laws(rules), then specify how principles are carried out. The four major principles guiding many institutional practices are: beneficence, non-maleficence, autonomy and justice (fairness). From these, courses of actions are derived. Which principle has priority in any one decision varies depending on personal beliefs, facts and other contextual information.
- **Ethical systems** are an important part of the process of justifying a particular action. The simple identification of principles and values is typically not sufficient to make a complex, difficult decision. At some point, justification for a particular choice begins to take place. Three of the more common ethical systems select different components of the conflict as a focal point: a person's motives, the consequences of the action, or an appeal to an external system of principles. As in the case with perspective, the action chosen is influenced by a tension between external forces such as obeying rules or finding a good outcome, and the character of individual (integrity).



Some philosophers argue that there really are only two systems for determining what is right or good. How "right" and "good" are connected through a course of action is the primary difference between two of the most common ethical systems which are

1. **Teleological Theories:** Right is defined as that which maximizes what is good or minimizes what is harmful for the greatest number of people. [\(See biblio.4\)](#) The focus is on the consequences or end. One example is utilitarianism which advocates maximizing the amount of "good" for the largest group. One problem with this system becomes who decides what is beneficial or harmful for whom? Good can be defined by the results of the final action chosen or by following a rule which allows for the most favorable outcome. Critics point out that a utilitarian philosophy can lead to behaviors which are clearly unacceptable. Imagine a town where people enjoy watching public hangings so much that the guilt or innocence of the one hanged is unimportant.
2. **Deontological Theories:** What is right and good are separated - one is independent of the other. Right is not defined in terms of what is good. These terms are not related in that producing a favorable outcome is not the goal. Doing right means avoiding actions which are said to be wrong by some external standard. [\(See biblio.9\)](#) For instance, if lying is wrong, then telling a lie to a person, who wants to kill another, is wrong even if the lie would prevent a death. Certain things are inherently right or wrong as often defined by religious tenets or professional codes of behavior. The Ten Commandments is an example of an external set of rules. One limitation of these systems is that not much assistance is offered when conflicts in stated principles arise. If principles have equal weight, how do you prioritize?

The last major system looks at the individual's character and does not rely on an external ethical set of guidelines:

- **Virtue theory:** This system focuses on the motives and intentions of the individual and asks what a "good person" would do in real-life situations. [\(See biblio.34\)](#) Virtue is used in the same sense as character traits or integrity. Virtue theory has its origins in the writings of ancient Greeks, [Thomas Aquinas](http://paul.spu.edu/~hawk/acquinas.html) (<http://paul.spu.edu/~hawk/acquinas.html>) and Kant. Those who favor virtue ethics complain the other two major theories ignore central and important questions about personal integrity or character. The philosopher Alasdair MacIntyre says that sources of virtue are based on a historical perspective which allows society to look back and then forward to find standards of excellence. [\(See biblio.28\)](#) Those standards encourage an individual to commit to a moral tradition found in certain practices such as medicine. One defect of this system is that a person could appear to lead a moral life, but inside have quite a different character. Two morally behaving individuals could have very different thoughts about how to deal with a conflict even while coming to the same decision. It would be more virtuous to not have thought about harming someone, whether the act was carried through or not.

Perspective is a way of viewing the world - a particular frame of reference or "lens" through which certain principles are filtered and applied to relationships between self and others. Perspectives can represent a source of conflict between values and principles. This is a key issue when examining how adolescent moral thinking evolves.



The following are examples of perspectives which have been described by psychologists after interviewing adolescents and adults. These perspectives, which are practical rather than theoretical, may co-exist in one individual and are not mutually exclusive. For example, several artists may view the same scene and produce widely varying interpretations as reflected in their paintings. This may explain why individuals approaching the same conflict select different solutions even if they have similar values and principles. [\(See biblio.27\)](#)

- **Perspective of justice:** Conflicts are viewed from the perspective in which you see yourself as a person separate from others. You consider others as you would like them to think of you; relationships are defined by rules and obligations to a particular role in life. Solutions to conflicts are approached by referring to impartial rules or standards. When deciding on a course of action, you consider what your obligations are and how you would like to be treated if in the other person's place.
- **Perspective of care:** Conflicts are concerned with issues that involve maintaining relationships. You view yourself connected to rather than separate from others. You see others in their own situations and contexts. Resolving the conflict involves approaching others on their own terms; the welfare of others is emphasized. You would try to do no harm and to relieve suffering.
- **Perspective of fairness or equality:** Conflicts come from a need to *balance* resources or desires among individuals or groups. One philosopher, John Rawls suggests imagining how an ideal group of people, blind to their own needs and desires, would determine what was fair when first faced with a similar problem. [\(See biblio.35\)](#) In principle, no one should benefit at the expense of another, particularly if that person can least afford the sacrifice. Justice, in this particular case, is defined in terms of fairness.

How can you tell which perspective you are using? The answers to these questions should help define your point of view.

1. What is more important, my needs or the other person, group or society?
2. Is maintaining relationships or adhering to impartial standards or rules more important?
3. Are there inherently right and wrong choices or are the standards for deciding what is fair purely arbitrary? What makes an action right? By whose rules do we abide?
4. Is equality the best definition of what is appropriate behavior for society

An example.....

A story follows which illustrates how conflict arises and these variables can enter into a decision. The way adolescents view this scenario is somewhat related to their educational level. Older students who better understand political institutions may have a more global or collective view and be better able to trace the long term consequences. Their view is more coherent than younger students because more experience produces a greater awareness of issues and risks which involve the whole community.



Story

The setting is in California and the conflict about the use of medicinal marijuana. In November of 1996, Californians were asked to vote on a voter's initiated ballot measure. Among other things, Proposition 215 (<http://vote96.ss.ca.gov/Vote96/html/BP/215.html>) exempted patients and defined caregivers from criminal prosecution for the possession and cultivation of marijuana for medical treatment when recommended by a physician. As of November 6, 1996, with 78% of the precincts reporting, 56.1% of Californians voting, said "yes" on Proposition 215. The results of court challenges are not known as of the publication date (9/97) of this paper.

Jane, who is a law abiding, caring person, believes that people should have access to drugs which provide relief to those suffering from the side effects of chemotherapy used to treat cancer and AIDS. Jane's friend, John is confined to bed while receiving intravenous therapy for several days each month. He has nausea and weight loss from his chemotherapy and he requests that Jane purchase some marijuana for him, as has been recommended by his doctor.

Jane is genuinely concerned about her friend's physical health, but she has observed what she believes is John's developing psychological dependence on marijuana. To be consistent with her view about access to drugs in the face of suffering, she feels obligated to buy the marijuana for John. However, she is troubled by the thought that giving drugs to her friend might also be harmful. What if John were injured or injured someone else while driving under the influence of marijuana?

Jane's values include honoring the quality of her friend's life, responding to requests for help, and obeying the law. These values are in conflict, creating a dilemma. Jane must set some priorities and realize that a course of action can, on the surface, appear contrary to her feelings about drug access, but at the same time, be internally consistent with principles having higher priority such as obeying the law or not harming others. Meeting her friend's need for more marijuana does not have to outweigh all the other values. Her perspectives may include both a belief in law and order and a strong need to maintain her friendship.

How does she go about prioritizing the conflicting values and arriving at a decision which honors her values and also respects her friendship?



One Strategy For Solving A Moral Problem:

In his book on life in the face of death, ethicist Ernie W.D Young describes an approach which has application outside of the hospital setting. [\(See biblio.42\)](#) When dealing with a moral problem, it is helpful to have a strategy to apply in resolving the conflict. There are many examples of moral problems and numerous approaches which can be used to engage students in discussions. As is often the case, the [analytical process](http://www.gene.com/ae/21st/TE/BE/) (<http://www.gene.com/ae/21st/TE/BE/>), which needs to be developed within a meaningful context, is the critical component. Young's strategy follows:

- **Step 1. Define the problem** so the dilemma is clearly understood by all parties: Determining whether a problem is on the one hand a matter of poor communication, failure to appreciate cultural or religious differences, or represents a genuine difference in values and principles means closely examining the issues involved. Some issues are readily addressed simply by clarifying the nature of the disagreement. There may also be more than one problem, which means prioritizing.
- **Step 2. Collect as much information** about the problem as you can before beginning to think about a solution: Accurate, comprehensive information is important and seems at the outset like it should be a straightforward task. However, even the facts can prove to be contentious. Consider how different witnesses view the same automobile accident. [\(See biblio.1\)](#) Equally important is to understand personal, religious, economic and cultural beliefs which are key components of the context framing the conflict.
- **Step 3. Identify the important values and principles** for you and the others who are involved: Values are grounded in beliefs which may be held consciously or unconsciously and are sometimes highly charged with emotion. For instance, a belief in God may predispose one to value human life as the most important value. Though sometimes difficult to articulate and not necessarily derived from a reasoning process, beliefs have a legitimate place in making a decision.
- **Step 4. Reflect on personal motives and intentions** in light of different courses of action and consequences to self, others and society. Motive can be distinguished from intention in that motive can be thought of as the "why", and intention the "what". What outcome is wanted and why is this desirable? Both of these questions apply to the individual's character.
- **Step 5. Prioritize** conflicting values and make a responsible decision. Consider that deciding to NOT make a decision represents one form of choice which has real consequences. This is best demonstrated by an example illustrating how the information is integrated and a course of action might be chosen.



Making decisions: An example

Edward Hundert, a psychiatrist and ethicist, developed a model to assist physicians in making life and death decisions involving patients. [\(See biblio.21\)](#) Hundert describes a practical technique for complex problems: He believes that each new dilemma represents a set of conflicting values. Making a list of these relevant values helps clarify what is important. Utilizing a scale which attempts to equate values, a decision can be made as to whether one side has more "weight" than the other. An example follows:

Problem: A psychiatrist must decide if a patient's mental illness warrants being committed to a psychiatric hospital. The moral principles involved are part of a physician's code of conduct stating that: the primary duty of a physician is to benefit the patient; to enable a patient to be a self-determining agent; to do no harm. A potential list of conflicting values follows:

To **Commit** against the patient's will versus to **Not Commit** the patient:

1. Concern for the patient's welfare and safety versus patient's right to individual liberty
2. Need to relieve patient's suffering versus patient's right to privacy
3. Concern for safety of others versus modesty concerning one's own ability to predict patient's future actions i.e. suicide or homicide

Most professional codes are deontological in nature. The physician integrates a prescribed code of behavior and weighs personal values, such as honoring the values of others, in the final choice. One principle illustrated in this example is the concern for the patient's welfare and safety or non-maleficence.

In the final analysis, the physician, guided by a code for ethical behavior, decides by being consistent with personal beliefs, perspective and professional ethical codes, which course of action is best. Should the patient remain free and subsequently commit suicide, this result might modify the physician's confidence in predicting a patient's future behavior and may change the priority given to that particular belief. The process of modifying future courses of action is called reflection or reflective equilibrium. [\(See biblio.35\)](#) Such experiences may change the physician's future decisions, but not necessarily alter the fundamental principles involved such as beneficence and non-maleficence. The change would only be in the prioritizing process



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"...if we decide that we do not have time to stop and think about right and wrong, then we do not have time to figure out right from wrong which means that we do not have time to live according to our model of right and wrong, which means, simply put, we don't have time for lives of integrity..." Stephen Carter [\(See biblio.6\)](#)

Technology and science are value laden:

- Our society is becoming increasingly technological in orientation. In technology as opposed to science there are several factors impacting the final product which an inventor needs to consider: the inventor's motives and intention; embedded objectives such as patent and market control; unintended consequences to the user. The development and marketing of the home refrigerator provides a good example. [\(See biblio.7\)](#) In the late 1920's, two competing types of refrigerators were available: electric compression and gas absorption. While the gas absorption had no moving parts and was silent as a result, the electric one had a motor which was being manufactured by companies in the United States. Furthermore, motors use electricity and this was advantageous for the utility companies. In the end, the gas absorption refrigerator is found in Europe, having been squeezed out of the market in the United States. Technology is value laden.
- With knowledge comes responsibility. The history of the human genome project (http://www.ornl.gov/TechResources/Human_Genome/resource/education.html) predicts we will determine the genetic causes of human disease long before treatment is available, even though these diseases are fundamental to current problems in society. "In short, in the vision inspired by the success of molecular biologists, 'nature' became newly malleable, perhaps infinitely so; certainly it was vastly more malleable than anyone had ever imagined 'nurture' to be." Some estimates are as long as fifty years between treatment or cure options and elucidation of the causes. The economic costs to individuals and society is enormous for some diseases and the pressure to somehow reduce the burden is rapidly increasing. [\(See biblio.25\)](#)
- The sense that objective insight is gained through detachment is a hallmark of the scientific process. However, the role of objectivity needs to be balanced by the realization that without our ability to walk-in-the-shoes of another, we may exist in a world of self-centered ignorance, depending largely on rationalization to make decisions which require a measure of compassion.
- Both factual knowledge and values are relative to where we are in the historical record. Over the course of a thousand or more years, scientific discoveries have been dismissed when they were deemed inconsistent with current thinking. With time, those disputed findings have been accepted as "truth" and changed the theoretical course of scientific history. What we have decided to value has also changed as we face a period in which our survival as a species may be determined by decisions this generation will make concerning managing environmental problems. [\(See biblio.39\)](#)



The time is right:

- Adolescents are passionately interested in moral questions suggesting this may be a critical time for moral education. [\(See biblio.12\)](#) Knowledge arises when the mind interacts with content; moral knowledge develops as an evolving process between the self and moral principles around real-life issues. The question is what role schools and teachers should play in the acquisition of this knowledge.
- Despite his critics, Kohlberg's theory continues to be the focus of much research on adolescents and moral thinking. Programs based on his theory present hypothetical moral dilemmas and the educator facilitates discussion by asking questions and challenging statements rather than presenting solutions. Such programs have resulted in advances in moral reasoning using Kohlberg's six stages as criteria. [\(See biblio.41\)](#)
- In response to a curriculum which stimulated moral thinking in adolescents, students report becoming more sensitive, more reflective and less hasty in their judgments. [\(See biblio.3\)](#) They are more aware of others' problems and of the consequences of their own actions or inaction. It has also been shown on tests of knowledge that acquisition and retention of discrete bits of information are facilitated in classrooms where teachers encourage discussion of controversial issues and encourage students to express their own opinion.
- Despite the concern that bioethical issues require complex critical thinking skills, using stage theories such as Piaget's which are based on brain maturation as a reason to lessen the cognitive challenges for early adolescents is not supported by the best available data. In fact most evidence suggests that such delays may be harmful. [\(See biblio.24\)](#)
- "Everything we do, then, as teachers, has moral overtones. Through dialogue, modeling, the provisions of practice, and the attribution of best motive, the one-caring as teacher nurture the ethical ideal. She cannot nurture the student intellectually without regard for the ethical ideal..."
Nel Noddings [\(See biblio.32\)](#)



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