

# Ethics and Science in Christian Education

**T**he topic of ethics and science in Christian higher education can be divided three ways: (1) ethics *and* science, (2) ethics *of* science, and (3) ethics *in* science. Although other areas of inquiry are also important, these three are essential.

## Ethics and Science

The word *science* hovers around the notion of “knowledge.” One way or another, science pertains to acquiring, preserving, and transmitting knowledge.

Ethics is more akin to judging than knowing. It attempts to determine what conditions or experiences are good or bad, what traits of character are virtuous or vicious, and what practices, institutions, and norms are right or wrong. Far from being mere preferences, ethical judgments are supported by lines of evidence and forms of reasoning that are public and debatable. When it is successful, an ethical judgment makes sense to “the person on the street” as well as other ethicists, even though it falls short of offering absolute proof.

Science tries to determine what “is,” whereas ethics attempts to establish what “ought to be.” If we were to illustrate these two disciplines on a blackboard, ethics and science would appear as overlapping circles. (See Figure 1.)

Ethics cannot make convincing judgments about what “ought to be”

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without knowing what “is.” What we should expect from other living beings, human and otherwise, and how we should relate to them, depends in part upon what we know about them and about the universe in which we live. Science gives us this knowledge.

Science also depends in part upon ethics. When a researcher decides that something is worthy of scientific study, this is an ethical judgment. Scientists choose their methods and materials based in part on ethical considerations. No scientist discerns things precisely as they are, but as they appear to him or her

based in part upon the scientist’s character and personal experiences. For instance, male researchers, and those who finance their studies, have often paid insufficient attention to the distinctive medical needs of women.

The size of the area shared by the overlapping circles of ethics and science varies, depending on the specialties of each field. The ethics of language and the science of physics share less common territory than do the ethics of virtue and the science of psychiatry, for instance. In every case, however, there is some overlap and some difference.

Because difficulties occur when either ethics or science tries to rule the other, they need to operate in a climate of mutual respect.

(In another setting, Paul called this “being subject to one another out of reverence for Christ” [Ephesians

5:21, NRSV.) Affirming that there is only one true God and that the Creator is far greater than either ethics or science should encourage specialists in both fields to relate to each other in helpful ways.

### Ethics of Science

A more complete understanding of the interplay between science and ethics begins with a review of some of science's positive features. One of these is that, when all other factors remain the same, the more we know about the universe and ourselves, the more healthy and happy our lives can be. It is difficult to overstate the extrinsic value of replacing ignorance with knowledge, even if only partially.

**T**he intrinsic value of gaining knowledge is also real and important. Imagine two human lives that are equal in every other good thing except knowledge. Is the uninformed life just as valuable from an ethical point of view as the informed one? Not at all! Knowledge is valuable in and of itself as well as for the benefits it often provides. From a Christian point of view, the better we understand God's creation, the greater will be our admiration for its Creator! For this reason, the redeemed will spend eternity studying the ways and works of God throughout the entire universe.

If what we learn from science conflicts with what we learn from Scripture, it is our ethical obligation to reassess our interpretations of the evidence from both fields in order to discover and correct our errors. In such instances, the problems lie with our interpretation of the evidence—whether scriptural, scientific, or both—not with the evidence itself.

Science is neither divine nor demonic, but human—with all that this implies. We humans are finite and fallible. However, within the parameters of certain very real limits, we are also free. Every scientific advance increases the prospects for joy and sorrow, good and evil, life and death. We cannot escape our obligation to responsibly exercise our freedom by retreating into ignorance. Our only option is to move forward in faith, hope, and love.

### Ethics in Science

Five important ethical principles relating to medicine and adjacent fields have useful applications in scientific endeavors as well. These principles, which point to corresponding virtues or positive traits of character, are not as general as the injunction to love God with the whole of one's being and one's neighbor as one's self. Nor are they

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as specific as the mandate to use black ink on acid-free paper in bound data books when recording laboratory results. Functioning somewhere between those extremes, these five principles outline the primary ethical obligations of those who do scientific research.

### Principle 1: Nonmaleficence

Scientists sometimes cause suffering and death in the course of their research. The principle of nonmaleficence says that it is wrong to do so if the scientist can identify no living being who might ever benefit from what he or she does and specify how the anticipated benefit might occur. Some Nazi doctors violated this principle when they tried to create artificially conjoined twins by stitching human beings together, since they had no justifiable therapeutic outcome in view.

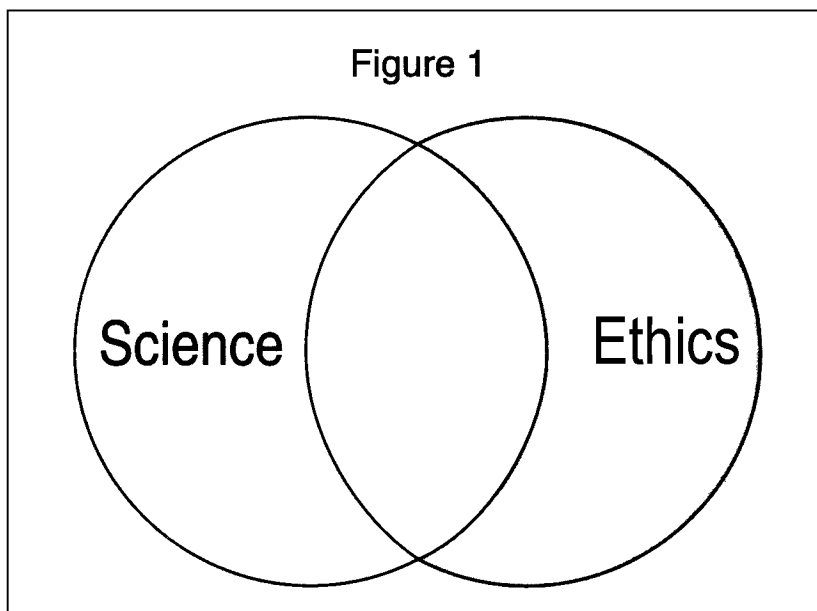
This is a minimal ethical obligation and inadequate by itself; however, it is an important principle because it condemns some grievous things that have been done to satisfy idle or malicious curiosity.

### Principle 2: Beneficence

The principle of beneficence requires scientists to do research that benefits living beings immediately or eventually. It is easy to condemn scientific research whose results makes it easier to harm or kill humans and other organisms. This judgment should be tempered, however, by the realization that one cannot always draw a clear line between offensive and defensive uses of such information.

For example, various nations have studied biological weapons in order to defend themselves against their use in war; however, knowledge gained in such studies can also be used to attack one's enemies. "Conceptual crossovers" of this sort are difficult to prevent.

A more common and clear violation of the principle of beneficence is doing scientific research that produces a product superficially but not effectively different from several oth-



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**Researchers who do experimentation on human beings have an ethical obligation to treat their subjects with respect and to inform them about the risks and anticipated benefits of the treatment.**

ers already on the market in an attempt to increase a corporation's profits. A number of "new" medications, for instance, are therapeutically indistinguishable from others already available. The companies that own such drugs expect the new patents on them to provide lucrative profits for many years to come. Developing such drugs violates the principle of beneficence, not because it is wrong to make a profit, but because the patented drugs contribute nothing new that enhances the common good.

### **Principle 3: Respect**

The principle of respect, often referred to as respect for autonomy, requires scientists to pay due consideration to the forms and degrees of self-determination experienced by those upon whom they do research. When they do research on human beings, researchers must distinguish between those who can approve of what will be done and those who cannot. Normal, healthy adults can decide for themselves; fetuses, infants, and children cannot. Neither can adults who are mentally incompetent, insufficiently informed, or rendered unable to comprehend by internal or external forces.

It is also important to distinguish between research that benefits the individuals upon whom it is performed (as well as others), often called therapeutic research, and studies that benefit only others, often called non-therapeutic research. Sometimes, researchers will offer a new treatment or drug to terminally ill patients, hoping that it may cure their disease or decrease their pain. On other occasions, however, researchers ask patients to allow them to administer something that has no intended or foreseeable benefits for the recipients in order to obtain knowledge that may help other patients. Voluntary, informed, and competent consent is the best policy in both instances; however, in the second type of case, it is always required.

Therapeutic research on human beings is ethically permissible if it meets at least three requirements: First, the intervention addresses a serious problem that can be solved in no other known

way. Second, the various costs experienced by the individual upon whom the research or experiment is done do not outweigh its benefits for him or her. This balancing of costs and benefits should take into account all of the relevant factors: physical, spiritual, financial, emotional, familial, and so forth. Third, either the individual in question, or an appropriate proxy who can indicate in a convincing way the individual's preferences, provides voluntary, informed, and competent consent. When no one is available to render such substituted judgments, qualified professionals should attempt to establish as objectively as possible what would be in the individual's best interests.

The criteria for adequate consent are more stringent for non-therapeutic research on human beings. This usually requires the full consent of the research subject or, in a few cases, the substituted judgment provided by appropriate surrogates. Consent based upon the standard of "best interests," as determined by otherwise qualified professionals, usually is insufficient. It is virtually impossible to imagine what would be in the best interests of a stranger, particularly when one may be unduly influenced by his or her desire to do non-therapeutic research upon the person.

Researchers also should consider the interests of non-human creatures upon which they do scientific research. Applying the principle of nonmaleficence is a first step in doing so; however, honoring the principle of beneficence is also required. The defini-

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tion of ethical treatment will vary with the degree of autonomy experienced by the organism. Greater ethical justification is required to perform non-therapeutic research upon great apes than upon laboratory mice, for instance. However, it is never ethically permissible to ignore the fundamental interests of any living being. Unfortunately, this has happened when some investigators have inflicted needless pain upon animals "just for the fun of it." Although the ethical obligation not to act in these pathological ways applies to all researchers, it is particularly binding for Chris-

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**Researchers should consider the interests of non-human creatures upon which they experiment, and not cause them needless pain.**

tians, who have been told in the Scriptures that God notices and cares when even a common bird suffers and dies.

#### **Principle 4: Justice**

The principle of justice demands that similar cases receive similar treatment and that each individual receive what he or she is due. Among other things, this means that the benefits and burdens of scientific research must be distributed fairly throughout the relevant population. Excluding people from these benefits or forcing them to bear a disproportionate share of the burden of research because of factors such as gender, race, religion, sexual orientation, ethnicity, marital status, philosophical point of view, or political preferences are clear (and frequent) violations of this principle. There are others as well. Generally speaking, the “rule of descending order” applies. As formulated by Hans Jonas, a Holocaust survivor and medical research scholar, this norm requires medical investigators to begin their studies on themselves, turning to those who are less well situated only as necessary. Unfortunately, researchers have often violated this norm by beginning

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their studies on the most vulnerable populations: students, patients, prisoners, the mentally ill, and the impoverished. It is more difficult by far for such persons to offer voluntary, informed, and competent consent.

#### **Principle 5: Veracity**

The principle of veracity probes the private life and work of the scientist by asking him or her to be strictly honest. The entire enterprise of science requires the greatest possible integrity when a researcher is studying, interpreting, evaluating, reporting, preserving, and transmitting evidence. No person is an ethical scientist if she or he is not fully committed to being true to the evidence, to himself or herself, to others and, most importantly, true to the Supreme Other.

As a careful study of the Sermon on the Mount (Matthew 5-7) indicates, Christians should affirm (“fulfill”) the legitimate ethical expectations of others. They should also go beyond (“exceed”) what others properly expect. They can do so by becoming more sensitive to their inner thoughts and feelings, by being willing to

go even further than necessary in the right direction, and by being more inclusive in a world that often creates artificial and destructive barriers. This is part of what it means to “Be perfect, therefore, as your heavenly Father is perfect” (Matthew 5:48, NRSV).

Perhaps this is the most important part! ☞

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