

## Ethical Reasoning, and “Rules” for Scientific Disagreement

### Ethical Reasoning

Each person has a list of **values** that they hold as important in their personal life and in their professional life. A list of such values has been developed at the center for ethics at the Jesuit University in Santa Clara which is used in the NSF-Research Experiences for Undergraduates (REU) program. This list is not all encompassing, but does contain a large number of the values that we bring to science.

Ethical reasoning comes into play when various individuals (**stakeholders**) enter into relationships with mutual obligations. Ethical reasoning involves weighing of values held by the stakeholders to result in some course of action or **outcome**. The first, although not always obvious, step in ethical reasoning involves indentifying stakeholders and values. This step is classified as a form of ethic sensitivity.

Methods of weighing outcomes are types of ethical reasoning or judgement. Philosophers define several main types of ethical arguments: **Character** or **value** driven theory focuses not on the outcome but on what will lead to personal moral growth by developing good habits. **Consequences**, or teleological, or utilitarianism, weighs the greater good for the most people. **Action** based behavior is deontological theory. It presumes that actions are inherently good or evil. Since an individual action carries moral weight then the end never justifies the means. An action is either permissible or not permissible. An action is permissible if it is one which can be applied equally to all, which is a form of the golden rule: do unto others as you would have them do unto you.

The worksheet used by the Santa Clara group suggests three types of ethical judgements: those that are driven by core values, those that are driven by the consequences, and those that involve judging rights. This can be used when reading “case studies” to assist in identifying the values involved, the stakeholders involved, and in identifying the likely consequences of a proposed course of action. This sheet can be used when reading the two attached case studies that involve analytical chemistry and lead public policy.

### Scientific Discourse

Scientific disagreements are the norm for science and are encouraged as leading to a “best” theory or accepted set of data which embodies our version of scientific “truth”. Scientific disagreements, however, expand to include non scientific issues, such as an individuals scientific or personal reputation. Several rules of engagement have been proposed and, in their shortened form, include a kind of 10 commandments (adapted from M. R. Wessel: Science and Conscience, Columbia University Press, N. Y., 1980, 97.):

1. **Openness**: Data will not be withheld because “negative” or “unhelpful”. Concealment will not be practiced for concealment’s sake. Relevant data will be disclosed when ready for analysis and peer review-even to an extremist opposition and without legal obligation.
2. **Disclosure** will not be postponed for tactical advantage.
3. **Delay** will not be employed as a tactic to avoid an undesired result.

4. **Motivation** of adversaries will not be unnecessarily or lightly impugned. Personal habits and characteristics will not be questioned unless relevant.
5. **Interest in an outcome**, relationship to a proponent, and bias, prejudice, and proclivity of any kind will be disclosed voluntarily and as a matter of course.
6. **Orderly retreat** and “exit” with honor will be left as an opportunity for an opponent.
7. **Unfair tricks** designed to mislead will not be employed to win a struggle.
8. **Complex ideas** will be simplified as much as possible to achieve maximum communication and lay understanding.
9. **Effort** will be made to identify and isolate subjective considerations involved in reaching technical conclusions. Hypothesis, uncertainty, and inadequate knowledge will be stated affirmatively - not conceded only reluctantly or under pressure. Unjustified assumptions and off-the-cuff comment will be avoided.
10. **Extremism** may be countered, but will not be matched with extremism. Dogmatism will be avoided.

Attached are two sets of readings. The first involves a series of articles exchanged between Drs. Needleman, on the one hand, and Ernhart and Scarr, on the other. These articles appeared in a journal *Ethics and Behavior* and can be used as a discussion both in ethical reasoning and in scientific discourse. The second set of readings involves a US Supreme Court Case involving a major manufacturer of lead acid batteries.