IDEESE Module 1.2
Transnational Accountability

MJ Peterson
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Learning Objectives

Students will be able to

1. understand why contemporary conditions create the need for transnational accountability.

2. understand why no single national government can ensure transnational accountability.

3. describe the various mechanisms for transnational accountability and indicate when each is likely to be used.

Outline for In-class Discussion

I. Sources of need for transnational accountability.

Pose question: Politically, the world is organized into separate countries run by their own governments. However, human life does not stop at the border. What kinds of activities occur across borders? Students should be able to identify:

A. Economic transactions: economies with a high level of cross-border connections ("interdependence," "globalization").

B. Social activity: increasing social interconnection among many societies through travel, migration, telecommunications, internet; even societies less strongly interconnected to others are more affected than in past centuries by the artistic and intellectual productions of other societies. This extends to both those culturally similar (e.g., China and Korea, Germany and Sweden, Brazil and Argentina, Uganda and Kenya, Egypt and Tunisia) and those culturally distant (e.g., Japan and Mexico, Iran and France).

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C. Human impacts on the natural environment: global impacts of greenhouse gas and ozone-depleting substances emissions, regional impacts of overfishing, desertification, long-range transport of air pollutants ("acid rain"), loss of species diversity, more concentrated but still cross-border impacts of river pollution, aid pollution, erosion.

II. Reasons no single national government can assure it

A. Political. Each government can regulate actions of anyone within the territory of the state it rules, and of its own nationals (members of its own state) when they are in other states, but it cannot effectively regulate actions of anyone else outside its territory because that is the job of another government.

Pose question: So there is a gap between the political organization of the world and the patterns of human activity. So far, neither governments nor citizens have been interested in creating a world government. So what have they done about the gap?

1. Closer regional cooperation: European Union the most extensive. NAFTA creates some tripartite decision-making processes among Canada, Mexico, US.

2. Greater coordination of national policies through international agreements and intergovernmental organizations. Examples include World Trade Organization, World Health Organization, UN Framework Convention on Climate Change, International Telecommunications Union.

3. Accepting private entities' coordination of certain activities. Examples include International Organization for Standardization (ISO), product certification schemes like Forest Stewardship Council and Fair Trade Coffee.

Pose question: Why does this gap persist?

1. Doubts about current feasibility of world government.

2. Territorial states still have strong social support: societies generally regard having a territorial state as a way to preserve their autonomy and ability to meld outside influences into their own culture and way of life as they decide is best.

B. Knowledge. There is also a gap between globally-valid scientific and technological knowledge and local patterns of its use and impacts.

1. Basic scientific and technical knowledge rests on understandings of human-independent physical systems.

2. Use of that basic knowledge in particular applications must be sensitive to local variations in physical conditions that affect how causal mechanisms identified in basic knowledge work in a particular place. (Though it is not transnational, one could

mention the famous Challenger O-rings: they functioned fine as long as they were not exposed for an extended period to temperatures below 50 degrees F).

3. Use of basic knowledge in particular applications will also be affected by fit with local cultural and social traditions and patterns. (Use car example: In US and Europe, where cars appeared first, drivers were mainly literate and had some basic understanding of vehicles. As driving became more widespread' licensing systems were set up to assure a baseline of driving competence. In India, Tata Industries introduced small, cheap cars in 2007 to a population of potential drivers neither possessing much understanding of motor vehicles nor subject to a licensing process.)

III. Mechanisms for Transnational Accountability

[There are lots of examples of each type; initial class discussion should mention which were used in the case.]

A. Transnational tort lawsuits: private person in one country harmed by actions of another private person that is a national of another country, sues the harmer in the courts of its state.

B. Self-regulation of member conduct in other countries by national scientific/or engineering communities.

C. Use of international scientific unions or engineering organizations to develop codes of conduct or to comment on particular activities.

D. Inter-government bodies: intergovernmental organizations and transgovernmental collaboration among regulatory agencies to harmonize legal rules and regulations and assist one another with enforcement.

E. Private bodies:

1. independent organizations (e.g., ISO)

2. industry-led (e.g., International Organic Farming Council)

3. environmental NGO-led (e.g., Fair Trade coffee, Forest Stewardship Council certification scheme)

F. Campaigns by transnational advocacy coalitions and/or social movements to get governments or corporations to react with regulations, penalties, or changes business practices.

Suggested Case Studies

1. "Reporting Incidence of Severe Acute Respiratory Syndrome (SARS):" International Dimensions of Ethics Education in Science and Engineering Case Study Series. http://umass.edu/sts/ethics

The Chinese Ministry of Health, which under a Chinese law adopted in 1991 was the sole body authorized to report outbreaks of contagious diseases to the World Health Organization (which then notifies national health authorities in other member states and, if needed, assists in coordination of efforts to contain outbreaks) came under intense criticism in Spring 2003 for failure to report the new form of atypical pneumonia identified as severe acute respiratory syndrome (SARS) in March 2003, allowing to spread to several other countries. Students will consider whether and, if so, on what basis Chinese authorities deserved blame.

This case should focus on the question of how the Chinese Ministry of Health was brought around to meeting others' expectations about reporting and cooperation. Focus on who asked for cooperation, either directly or through the media, and what arguments or incentives they could provide. Be sure students pay attention to domestic Chinese factors inhibiting or pushing for greater reporting and cooperation.

2. "The EU-US Dispute over Regulation of Genetically Modified Organisms, Plants, Feeds, and Foods:" International Dimensions of Ethics Education in Science and Engineering Case Study Series. http://umass.edu/sts/ethics

   A. Discussion of trace presence of GM material in feed shipments in the Codex Alimentarius Commission and the potential EU feed grain crisis.

      EU regulations on GM organisms in plants permit 0.5% of total shipment of grain or other crops to contain "adventitiously" (unintentionally) introduced GM material. Countries in other parts of the world allow 0.9%. A late 2007 report from the EU Directorate-General of Agriculture and Environment projected a significant feed grain shortage if the EU standard were maintained. Negotiation on resolving the difference has occurred in the UN's Codex Alimentarius Commission, but as of the end of 2007 had not reached agreement on an international standard. In this case, students can be put in the roles of members of the commission from different countries and consider whether the commission should adopt the 0.9% as the global standard. Roles should include EU, US, Latin American, and Chinese and/or Indian members.

   B. China and India as Intervenors in a hypothetical US versus EU trade dispute over the distinction between GM and marker-assisted trait modification in plants.

      A late 2006 speech by the EU's Commissioner in charge of the Directorate-General of Agriculture and Environment revealed a potentially significant inconsistency in EU regulations on plant breeding. Gene modification techniques are subject to very strict regulation while MAS techniques are not. Yet, some observers claim the results for people and the environment can be very similar. This case casts students as officials in China or India considering whether to intervene by filing a Third Party brief in a hypothetical WTO dispute settlement case initiated by the USA against the EU. The US's lawyers will be using the evidence of similarity in effect to attack the EU's regulations on GM foods as failing to meet the standard of scientific basis for

regulatory measures under the WTO Agreement on Sanitary and Phytosanitary Measures, thus forcing significant change in the EU limits on marketing of feeds and foods grown from GM modified seeds or plant stock. EU lawyers will be seeking to maintain that the distinction has a scientific basis, so to maintain current EU regulations. Students will consider whether to support the US or the EU position.

Recommended Readings for Students

For assignment prior to class discussion

1.) Transnational Aspects of Ethical Debate [included in this module]

2.) Background Reading on Mechanisms of Transnational Accountability [included in this module]

3.) Roots of Interconnection: Communications, Transportation and Phases of the Industrial Revolution [included in this module]

4.) Diagram of Transborder Environmental Effects [included in this module]

5.) Bernstein, "Liberal Environmentalism and global environmental governance," *Global Environmental Politics* 2/#3: 1-16 (Aug. 2002) [copyright permissions necessary]

Abstract: Global environmental governance rests on a set of norms best characterized by the label "liberal environmentalism." The 1992 Earth Summit catalyzed the process of institutionalizing these norms, which predicate environmental protection on the promotion and maintenance of a liberal economic order. To support this claim, this article identifies the specific norms institutionalized since Rio that undergird international environmental treaties, policies and programs. It also explains why a shift toward liberal environmentalism occurred from earlier, very different, bases of environmental governance. The implications of this shift are then outlined, with examples drawn from responses to climate change, forest protection and use, and biosafety. The article is not an endorsement of liberal environmentalism. Rather, it shows that institutions that have developed in response to global environmental problems support particular kinds of values and goals, with important implications for the constraints and opportunities to combat the world's most serious environmental problems.

6.) Case materials – varies according to case selection

Recommended Readings for Instructors

1.) Instructors new to ethics topics might find helpful the entries in Donald M. Borchert, ed., *Encyclopedia of Philosophy*, 2nd edition (Detroit: Thompson-Gale, 2006) on "Ethics" (v.3 pp. 379-393); "Ethics and Morality" (v.3 pp. 450-451); "Equality, Moral and Social" (v. 3, pp. 329-332); "Equality, Moral and Social [Addendum] (v.3 pp. 334-336) and "Feminist Ethics" (v. 3 pp. 578-581).

Resources Included with this Module

1.) Transnational Aspects of Ethical Debate

2.) Mechanisms of Transnational Accountability

3.) Roots of Interconnection: Communications, Transportation and Phases of the Industrial Revolution

4.) Diagrams of Transnational Diffusion

5.) In-Class Evaluation

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IDEESE Module 1.2 Resources

Transnational Aspects of Ethical Debate

MJ Peterson
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The terms "ethics" and "morality" used in their most general sense refer to the traditions of belief about right and wrong conduct that exist in the various societies of the world. The terms "ethical theory" and "moral philosophy" refer to philosophical discussions of ethics or morality intended to increase the logical coherence, precision, and real world applicability of the principles and maxims derived from those ethical or moral traditions.

Individual humans begin learning the rules of conduct that derive from the morality prevailing in their society even before they understand that there is a distinct category of rules called "ethical" or "moral" or how those rules differ in character from rules of law, etiquette, or everyday prudence. Children are told and encouraged to follow many rules, such as "keep your fingers out of the electrical outlets," "look both ways before crossing the street," "line up and wait your turn," "don't drop your candy wrapper on the sidewalk," "say good morning to the bus driver when you get on," "be nice to grandmother" and "tell the truth" without being told which of them are based on prudence, local law, etiquette, or ethics. As children develop towards adulthood, they begin to learn the differences, and come to understand that ethics and morality focus on the problem of acting in ways that are respectful of others and take their interests and needs into account. The growing children also begin to see that the individual ethical rules are not random maxims, but are shaped by a more or less coherent set of more general guidelines that have developed over the years in their society and are understood by everyone in it. Individuals make their own choices, but – even when they are rebelling against it – they are influenced by the ethics and ethical rules of the society in which they live.

Individuals vary considerably in the depth of their interest in thinking beyond rules to ethical theory and moral philosophy. Invariably following a rule requires very little thought; one simply asks whether the situation at hand is covered by the rule. If it is, one follows the rule; if it is not, one does not. However, many situations are not so simple that automatic rule following assures the best moral result. Almost no one gets through life without encountering ethical dilemmas, situations in which there are very good ethical reasons for undertaking each of two or more mutually exclusive acts. For most of the elderly, remaining in their own home or moving to a retirement community is mutually exclusive because they cannot afford to maintain two residences. Thus, the middle-aged children of an unsteady 90 year old still living in the house where they grew up will feel the pinch of competing ethical principles when facing a decision about whether

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to encourage their parent to move to a retirement home. Living at home allows the parent to remain more autonomous. Yet, living in a retirement home affords the parent greater personal safety because others are around to help in the event of a fall or to undertake household tasks that have become too difficult for the 90 year old to accomplish alone. If the children truly respect their parent's autonomy, they will not want to force the parent into a retirement home, but if the parent's unsteadiness gets to the point of interfering with daily tasks they can't help feeling that the parent would be safer there. They will seek to reduce the dilemma by trying to persuade the parent to move; if they succeed the parent will have made the autonomy-safety trade in an autonomous fashion. It is when the persuasion fails that the children really face the dilemma.

The toughest moral dilemmas arise when the good moral reasons for each alternative also include good moral reasons for avoiding the other alternative or alternatives. Psychologists are often faced with situations in which a patient utters threats to kill a particular person. Once the psychologist decides, after additional talking with the patient, that the threats are real – not just blustering talk that reduces frustration by allowing its expression in exaggerated form – the psychologist has to choose between violating rules of confidentiality to warn the person threatened or violating society's general ethical expectations that someone who knows of a murder plan should warn the victim and/or the police so the murder can be thwarted. The children of the 90 year old could deal with the tension by putting their parent in the center of the deciding process; here the psychologist is likely to be in the position of having to act on his or her individual judgment. Maintaining confidentiality carries a serious danger of allowing physical harm to a person; breaking confidentiality carries a real danger of eroding patients' confidence that psychologists will keep their secrets to the point they are less willing to seek treatment. Deciding which consideration should have been given greater weight in guiding the psychologist's conduct may seem easy afterward: if the murder occurs, it will be "obvious" to most people that safety should have prevailed over confidentiality.[1] However, the psychologist must decide before the results are known.

Most moral philosophy and ethical discussion assumes that everyone involved in or observing the situation shares the same broad values, expresses them in similar rules, and gives the values similar weight when balancing between competing rules. Ethical arguing becomes more complicated when different people maintain non-identical sets of values (for instance, individualists who emphasize autonomy and individual freedom and communitarians who emphasize membership in groups and allowing groups room to follow their way of life), express the same value in different rules (for instance, believe that humans have a right to life but disagree about abortion because some define "life" as beginning at the moment sperm and egg trigger the process of fetus development and others define it as beginning at the point a fetus could survive outside the womb), or maintain different hierarchies among values (for instance, a situation in which some regard privacy as more important than public access to information about past criminal records and others regard knowing the whereabouts of repeat pedophiles who have finished serving their jail terms as more important than privacy).

Ethical theory and moral philosophy have long faced the challenge of individual moral relativism – the claim that ethical and moral beliefs are a matter of individual choice because there is no way to prove that any one standard is superior to all others. In today's globalized world, ethical theory and moral philosophy also

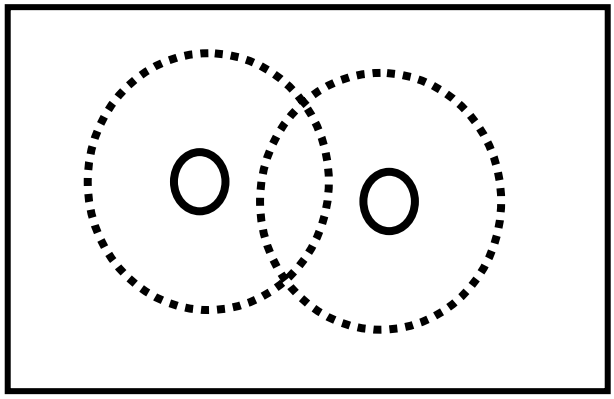
[1] "Most" because when the California Supreme Court was faced with this question in 1976, a majority of the judges ruled that the psychologist involved did have a duty to report but one dissented on grounds that public knowledge psychologists had a duty to report death threats would discourage people from seeking treatment. See Tarasoff v. Regents of the University of California, *California Reporter* vol. 131, p. 14 (1976).

have to address the challenge of cultural moral relativism, the idea that the different ethical beliefs of the many societies around the world deserve equal respect whatever their content and whatever the content of the rules derived from them. Arguments in favor of cultural moral relativism start from the well-established observation that traditions of ethics and morality and the sets of rules derived from them do vary from one society to another. The next step in such arguments is to claim that no society has the right to criticize the ethics, or ethical rules of another because a.) there is no ethics or set of ethical rules shared by every society on Earth, b.) ethics and sets of ethical rules form organic wholes that can be understood, interpreted, and applied only in the context of the culture in which they developed, and c.) the right of self determination (codified internationally in the UN Charter, the Universal Declaration of Human Rights, and the International Covenants on Human Rights) means that each society possesses the right to follow its own traditions and ways of life.

One of the strongest arguments against cultural moral relativism claims there is a universal human nature or a universal set of human needs, which lead to adoption of similar basic moral values in all cultures. Adherents of this view further argue that most of what appear to be cultural differences in ethical systems are differences of how people interpret and apply these similar basic beliefs in particular situations. Rather than a "relativism of standards" in which different societies have different basic ethical beliefs, they see a "relativism of judgments" in which rules for and evaluations of conduct in particular situations differ.[2] This is simply an extension across societies of the relativism of judgments that appear even in a single culture, as in the abortion and privacy examples given earlier.

However, relativism of judgment does not prove the existence of relativism of standards. Inquiry must go beyond the differences in judgment and uncover, as much as possible, the more basic ethical beliefs and interpretations of those beliefs from which those judgments arise. Suppose, for the sake of continuing this discussion that relativism of standards does exist, either in all areas of life or in some areas. The existence of different fundamental standards might be thought to prevent members of two or more societies from having useful discussions and develop a reasoned consensus on how to proceed in a particular situation. Such claims ignore the pervasive relativism of judgments around the world, and the fact that different adherents of the same ethical standard may disagree on what to do. If we think of basic ethical beliefs as a small circle and the range of judgments they inspire as a larger one having the same center, it is entirely possible that the large circles of judgment extending beyond the small circles of basic principles will actually overlap. In that overlap adherents of different beliefs would find common ground for action in the world. (See Figure 1.)

Figure 1: Common Ground in Ethical Beliefs



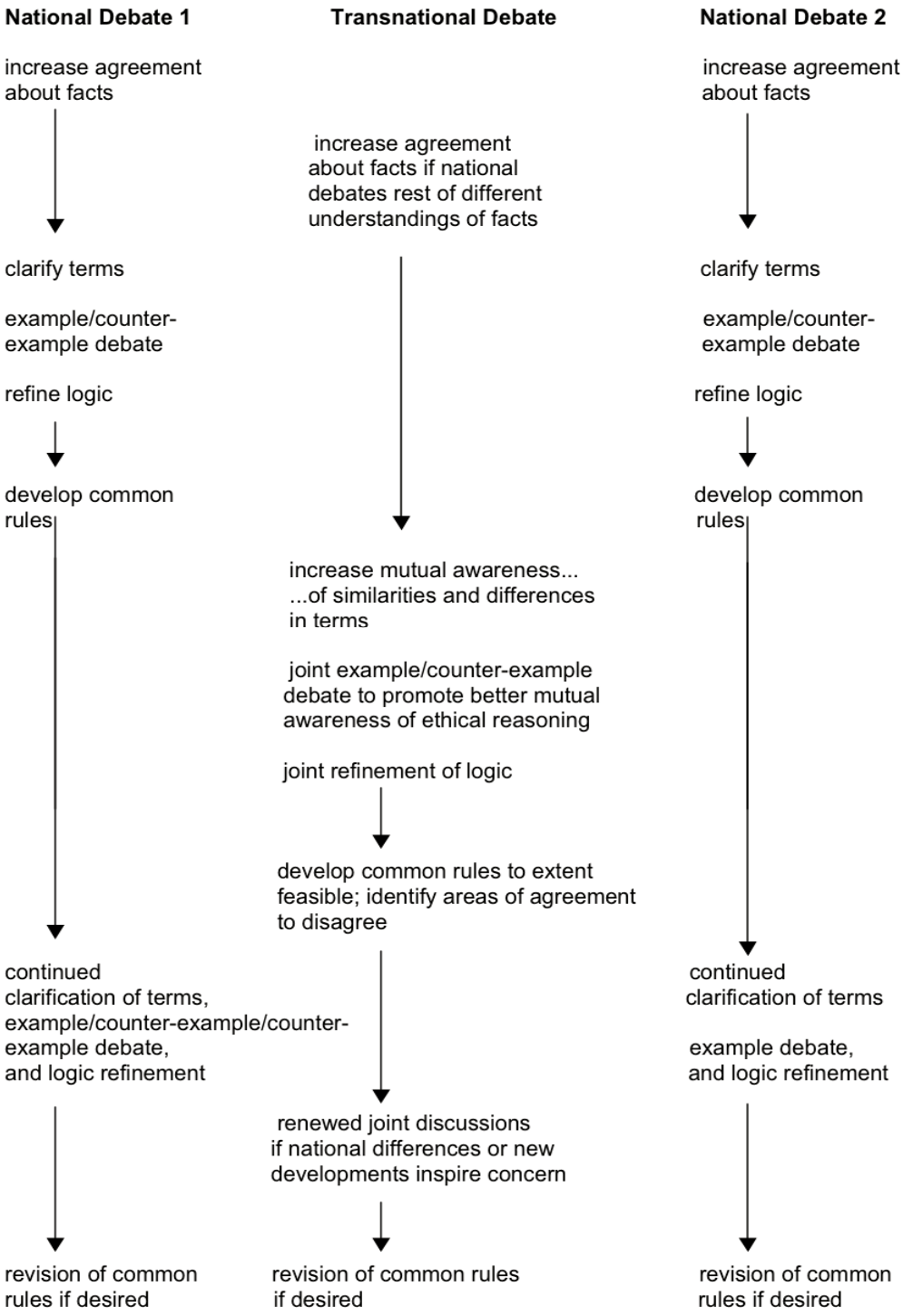
Invoking relativism of standards as a reason to forego moral debate also ignores the fact that people learn about and refine both their basic ethical beliefs and their particular ethical judgments by participating in or observing arguments. They may not converge on an identical way of handling the situation; they may have

[2] Distinction used by Tom L. Beauchamp and LeRoy Walters, *Contemporary Issues in Bioethics* (4th edition. Belmont, CA: Wadsworth Publishing Company, 1994), p. 8.

to develop a compromise. Yet, in process of discussion there will be a sifting of ethical claims and counterclaims in which some secure are accepted or at least considered as worthy of consideration by a larger number of participants than others. The more persuasive ones will become the focus of attention and the basis for compromises while the less persuasive ones will be set aside (not necessarily rejected for all time, just not used in discussion of how to handle this particular situation or type of situation at this time).

It should now be clear that the distinctive element of transnational ethical differences (see diagram on the next page) is the need to be particularly sensitive to the question of how far the differences of view expressed by participants depend on culturally-derived differences in judgments and/or standards. Whereas national ethical debates proceed against the background of a thick set of shared cultural references and practices, transnational ethical debates do not. Clarification of terms may have proceeded along different paths, making a literal translation of a phrase from one language into another misleading. The moral codes may be different in significant ways. The process of arguing by example and counter-example can be slowed down, though very likely enriched, by the different exemplary stories familiar in various cultures. These differences mean that participants in transnational ethical debates must be willing not only to hear the questions and explanations of others, but also, to elaborate their own positions and explanations in ways that help participants from other cultures to understand them accurately. This requires making one's own tacit assumptions explicit, something that can be difficult because the background knowledge provided by a culture is so taken for granted that a participant may have trouble bringing relevant parts of into active memory where it is available for conscious expression. Yet, if enough participants make this effort the result will be a better informed debate all around even if in the end participants "agree to disagree", and design a solution allowing divergent approaches rather than settling on a common one.

National and Transnational Processes of Ethics Debates



IDEESE Module 1.2 Resources

Mechanisms of Transnational Accountability

MJ Peterson
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The absence of world government means there are no central world courts or regulatory agencies where persons or firms causing harm to others can be brought to account. However, there are ways that people in one country suffering harm from actions undertaken by individuals, business firms, or organizations from another can hold the causers of likely or actual harm accountable for their actions. This involves taking advantage of the various regulatory and standards systems that exist around the world. "Regulations" is typically used to describe government-developed rules implemented and enforced through official agencies. "Standards" is typically used to describe privately-developed rules adopted, implemented, and enforced either spontaneously (because it is in the interest of addressees to follow them) or through third-party certification (that is, some entity other than the company making a product or the purchaser buying it monitors production and indicates when production meets the standards).

Using National Legal Systems

The most common form of transnational holding harm causers to account involves use of national legal systems to press criminal charges or secure civil law remedies against someone whose actions caused harm. There are two ways of using national legal systems: resorting to the national law and courts in the country where the harm occurred, and resorting to the national law and courts of the home country of the person or entity that caused the harm. In international law, the term “territorial jurisdiction” is used to denote resort to the law and courts of the country where the harm occurred, and the term “nationality jurisdiction” used to denote resort to the law and courts of the home country of the harm causer. In discussions of multinational corporations or foreign investors, “host state law” refers to the legal system of the country where the business activity is undertaken and “home state law” refers to the legal system of the country where the multinational corporation has its headquarters or the investor is a national. Suing a harm-causer in its home state courts is most obviously a “transnational” remedy since it goes outside the borders of the state where the harm happened, but even local lawsuits have a transnational aspect if the harm causer is from a different country.

Criminal charges are possible only when the action that caused the harm directly violates a law that defines the activity as a crime and imposes criminal penalties. Criminal law differs from one country to another, so an action that is legal in country A may be a crime in country B. For instance, printing or broadcasting

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pictures of people wearing scanty swimwear is legal in France, but not in Saudi Arabia. Even when an act is clearly illegal and defined as a crime, prosecutors may not seek punishment of the person who did it: some crimes are not detected, some are detected but there is insufficient evidence to convict any particular person of the crime, limits on time and resources sometimes lead prosecutors to ignore a lesser crime for which they do have enough evidence to convict someone because they have more important cases to handle, and well-connected people often wiggle out of charges by using their influence. Most countries do not prosecute their own nationals for acts that are legal where done even if they are illegal at home. However, most have laws that permit the government to prosecute nationals for all or some illegal actions they do abroad, and something causing sufficient public scandal at home might induce prosecutors to press charges. Even if an act is illegal both at home and where done, governments prefer that criminal trials be handled in the state where the crime occurred, mainly because local prosecutors can get hold of the relevant evidence more easily.

Civil law, the body of law that allows private persons or entities to sue other private persons or entities that caused them harm, can be applied whether the action producing the harm was legal or not; the focus in civil law is on compensation for the harm. Civil law also differs from country to country; sometimes in the definition of "harm," sometimes in the type or extent of compensation available, and sometimes in the standard of liability to pay compensation. The standard of liability can be the most important difference: the usual standard is negligence – the victim needs to show that the causer of harm was being careless when the harm was caused – but sometimes a law imposes strict liability – meaning the victim of harm needs to show only that the other person caused harm.

Governments generally prefer that private persons take their civil law disputes to the courts of the state where the problem occurred. However, the choice of where to go rests with the private individuals involved. Individuals or firms involved in cross-border business activity often specify in their contracts which country's courts will be used in the event of a dispute. However, those "choice of law" clauses are binding only on those who signed the contract; they do not affect the right of anyone else harmed by the activity to sue where they prefer. This can lead to some maneuvering on both sides. Harm causers sometimes prefer being sued in the courts where the harm occurred; this is particularly likely if the standard of liability is less strict or the standard of compensation is less generous than at home. Harm sufferers may like the standard of liability or the standard of compensation in the harm-causer's home state better, and sometimes succeed in persuading its courts to take the case despite government's preference for using the courts of the country where the harm occurred.

Using National Regulatory Agencies

In some countries regulatory agencies can impose penalties for causing harm without having to take the matter to a court. Such agencies must follow certain procedures, and in almost all countries anyone believing that a regulatory agency acted unfairly can have the agency's action reviewed by a court or a special administrative council.

Many regulatory agencies perform periodic inspections of factories, laboratories, and other workplaces to check for compliance with national regulations. If an inspection detects deficiencies, the owner or manager is expected to correct the deficiencies within a specified period of time. Owners and/or managers may also be fined immediately if the deficiency is serious, or later if they fail to correct the deficiency within the allowed timeframe. In countries with well-staffed regulatory agencies, the inspectors then return to confirm

that the corrections have been made. In countries with small regulatory agencies, inspectors may not come very often and may not follow up effectively. Inspection systems are intended to identify unsafe conditions before harm is caused, but even the world's best-staffed and equipped regulatory agencies cannot prevent all harm. Inspections may not identify every problem, and new problems can arise after an inspection.

Regulatory agencies are even more territorially-oriented than courts; they carry out inspections only in their own country. However, they pay attention to news about major industrial incidents in other countries and may undertake special inspections of the type of workplace involved, particularly if it is owned by the same company or uses similar equipment. Regulatory agencies also learn from one another, and agencies in industrial countries often assist their counterparts in developing countries with training or lending of personnel for short periods.

Using Inter-Government Bodies

Inter-government bodies, whether international organizations or networks of government regulatory agencies, are often used to develop common standards, encourage governments to implement them, and SS governments and developing the administrative capacity needed to implement a war and forced them. Most inter-government bodies are not involved in holding particular individuals to account for their violations of regulations, that is typically left to the regulatory agencies of each member state. In the area of human rights, procedures allowing individuals to complain to an inter-government body about their own government's violations of human rights have emerged in parts of the world. Similar processes do not exist in other areas; the traditional assumption that the government where activity occurs has primary regulatory control over it still prevails.[3] Governments whose nationals are involved in an activity may also extend their regulations to those nationals even when the activity is abroad, but the basic principle of international law on jurisdiction is that jurisdiction asserted on the basis of territory prevails over jurisdiction asserted on the basis of nationality.

Governments are most likely to establish intergovernmental organizations when they face a recurring problem that they cannot solve through unilateral or bilateral action, but need cooperation from a larger number of governments.[4] Establishing an intergovernmental organization facilitates cooperation among large numbers of governments by establishing common rules for decision-making, common procedures for dealing with misunderstandings or disputes, and a central staff to take care of routine clerical functions plus whatever substantial tasks the member governments decide to delegate. In deciding whether to establish a new intergovernmental organization or to join an existing one, governments consider whether the gains from cooperating with the group will outweigh the costs; these costs take the form of loss of choice as any particular government may find itself outvoted in the organization, and commitments of resources required to maintain the organization as well as to pursue the cooperation. Thus, the gains from cooperation must be significant for a government to join enthusiastically. In certain circumstances, however, a government will join an organization despite lack of enthusiasm because it realizes that the cooperative project is going

[3] Even in the European Union, where individuals can complain to the European Court of Justice about their country's lack of enforcement of an EU rule, the system leaves enforcement to the individual countries rather than to the EU bureaucracy.

[4] Kenneth Abbott and Duncan Snidal, "Why states act through formal international organizations," *Journal of Conflict Resolution* 42/1: 3-32 (Feb. 1998).

to go ahead and that it will be worse off outside, where it cannot influence the direction of the project, then inside.[5] Intergovernmental organizations engage in a variety of activities relevant to transnational accountability.

First, their decision-making bodies provide forums in which member governments can raise issues, express concerns, and engage in "naming and shaming" of those members they regard as particularly laggard in the cooperative effort.

Second, either the Secretariat or a special committee reporting to the primary decision-making body can be charged with receiving reports on activity from member states, reviewing the reports, engaging in dialogue about performance with the member government involved, and, in some organizations, report the matter to the primary decision-making body if dialogue fails to inspire increased effort by the member involved. Such mechanisms are particularly common in intergovernmental organizations addressing environmental problems, but also exist in intergovernmental organizations dealing with other issues.

Third, the organization can facilitate diffusion of best administrative practices and development of administrative capacity among the smaller and poorer members. Such programs might involve the organization's permanent staff, they might involve temporary employees seconded from government service or hired from the private sector, they might involve officials of one member state assisting or training officials from others. Immediately after World War II, UNESCO was central to the development of science policy agencies in member states where close connection between the government and the scientific community was not already an established tradition.[6] Such efforts may also occur through the mechanism of special committees. The 1985 Vienna Convention for the Preservation of the Ozone Layer established scientific, technical and economic, and environmental impact assessment panels to assist decision-making with expert advice. Atmospheric scientists in the first provide assessments of the physical state of the ozone layer while engineers and others in the second provide a forum for disseminating ideas on decreasing use, substituting non-depleting substances, and other manufacturing and product related questions.[7]

While helpful, an intergovernmental organization is not necessary to transnational regulatory cooperation. Members of government regulatory agencies addressing the same problems or issues can cooperate with each other directly if their political superiors allow them to establish a trans-governmental network. Such networks involve peer-to-peer collaboration rather than formalized decision-making, but if each national agency adopts similar regulations a trans-governmental network can produce as much regulatory harmonization or standardization as decisions in an intergovernmental organization. There is considerable tacit regulatory harmonization and standardization around the world; regulatory agencies in smaller industrial countries or in developing countries, which lack the extensive resources for testing, monitoring field activity, or collating the results of multiple clinical trials, follow the activities of agencies in the major

[5] Lloyd Gruber, *Ruling the World: Power Politics and the Rise of Supranational Institutions* (Princeton, NJ: Princeton University Press, 2000).

[6] Martha Finnemore, "International organizations as teachers of norms: the United Nations Educational, Scientific, and Cultural Organization and science policy, *International Organization* 47/4: 565-597.

[7] The Technology and Economic Assessment Panel (originally established as separate committees in the 1986 Montreal Protocol on, and merged in 1989) and 6 Technical Options Committees. See http://ozone.unep.org/Assessment_Panels.

industrial countries and often use those agencies' regulatory decisions as inspiration for their own regulations.

In some areas, use of intergovernmental organizations and trans-governmental networks for regulatory standardization and cooperation in enforcement is combined into a process in which the intergovernmental organization serves as a forum for basic decisions about regulations and establishes basic guidelines, while national governments retain certain areas of choice. These national choices, for instance decisions to ban the entry of toxic waste into a particular country[8] or to ban imports of certain genetically modified plants,[9] are then made known to all cooperating governments through a system of "national focal points" -- each governments designated agency -- reporting those decision to an organization maintained common website. Officials of national agencies in each member state, as well as affected private entities, can go to the common website for the information they need. In Europe and in East Asia, enforcement of maritime safety regulations is facilitated through regional memoranda of understanding among the port authorities of different countries. The MOUs include establishment of a secure website to which the port authorities in each state can post results of ship inspections. This permits the port authorities in other states to direct their enforcement efforts toward those ships that failed in earlier inspection or have not been inspected for a significant length of time.[10]

Using Private Business or Public Interest Organizations

The increasing volume and pace and variety of trans-border investment, trade, travel, research collaboration, and other contacts poses significant challenges for government regulators. However, particularly in the more politically and economically liberal states, where citizens are encouraged to form their own organizations and develop their own activities and where market participants are allowed to make their own decisions, governments do not seek to regulate every conceivable form of activity. They tend to focus on those activities that have particularly strong implications for the general public, such as air and water pollution, transportation safety, wholesomeness of food, and safety of pharmaceuticals. Yet, companies and researchers often find their activities more effective if they operate to a standard. For companies, the standard may address the size and design of machines. Having standard scanning on television sets allows consumers to choose from several makers with confidence that they will be able to receive available programming. Yet, companies may also want to standardize certain processes of operation. The ISO 9000 standards address internal activities, and help companies design processes that will manage and improve quality control, orders, payments, and deliveries more effectively. The ISO 14000 standards address environmental management, identifying and minimizing the negative impact of company

[8] 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. Text available at www.basel.int.text/documents.html and information about the process at the secretariat's general website, www.basel.int. The later developing country shift of "default" from prior informed consent to ban was institutionalized globally in the Basel Ban Amendment that became effective in 2005, in Africa by the 2002 Bamako Convention, and EU regulations incorporating the Basel Ban Amendment.

[9] 2000 Cartagena Protocol on Biosafety. Text available at www.cdb.int/biosafety/protocol.shtml and general information about the process from the Convention on Biological Diversity secretariat's website www.cbd.int/biosafety.

[10] Mark Zacher with Brent A. Sutton, *Governing Global Networks: International Regimes for Transportation and Communications* (New York: Cambridge University Press, 1996).

activity on the natural environment.[11] Though governments did not play a direct role in development of the ISO 9000 or 14000 standards, they have encouraged companies to meet those standards and be certified as meeting those standards by making certification a requirement for bidding on government contracts. Researchers also find standardization useful in certain areas. Chemists around the world can understand each other's research better if they all use the same system of chemical symbols to summarize the number of atoms of each element and the shape of the connection between atoms found in each compound. Similarly, genetic research requires common notations for gene sequences. Scientists thus use general or specific trans-national scientific organizations as platforms for developing standards.

The ISO is a private body that develops standards through technical committees composed of experts in the particular area named by participating national organizations. These are primarily industry associations but also include consumer and other groups.[12] In some areas there are also industry-specific associations involved in developing common standards and monitoring enterprises' adherence to them. For instance, there is an International Organic Farming Council that develops standards defining practices qualifying a form as "organic" and maintains a monitoring system for certifying particular forms as meeting those standards. This has become increasingly important as consumer interest in organic foods has increased, inspiring greater efforts not only by true organic farmers but by others seeking to present themselves as organic even if their practices fail to be fully organic. The International Organic Forming Council and attempts to separate the two, by certifying the former and denying certification to the latter.

The fair trade and environmental movements have developed a slightly different form of trans-national private certification. Rather than rely on either industry associations or consumer groups, certain transnational nongovernmental organizations promoting fair trade and ecological sustainability have developed their own certification systems. These "third party" systems develop standards, and encourage their use by companies, monitor company's activities, and permit those companies whose activities meet the standards to display a special logo in their advertising and on their packaging. The logo is a message to consumers that the company meets high standards in the areas of working conditions, treatment of suppliers, and/or ecological sustainability of operations.[13]

Since fewer people are affected by them, there is much less discussion of the possible roles of national or international scientific and engineering associations in enforcing standards. When those standards involve things like chemical notation systems, the standards are self-enforcing. Researchers who want to work understood while spontaneously adopt the standards (once they are aware of them, and awareness is the national or international association's job). For many researchers, ethical standards will be self-enforcing, but national and international associations may well have to deal with the exceptions. National scientific/or engineering associations can apply their own ethical codes to the activities of their members in other countries, for the simple reason that going abroad does not cancel membership in the association. Transnational scientific or engineering associations have more obvious cross-border impact since their

[11] ISO is the all-languages short name adopted by the International Organization for Standardization. See its website www.iso.org.

[12] ISO provides a brief description at www.iso.org/iso/standards_development.

[13] In fair trade, Fairtrade Labelling Organizations International (www.fairtrade.net) coordinates activities of 23 member national-level certification organizations; in lumber and wood products the Forest Stewardship Council (www.fsc.org) is the global coordinator.

members live in many countries. Yet, even they can face a transnational ethical problem if a member who is a citizen of one country undertakes ethically undesirable activity in another. Though the typical association has a single code of ethics for all members, application of the code in a particular case may require sensitivity to the local culture and situation.

Common codes of ethics are less developed at the international level, although both international scientific unions and engineering organizations have addressed transnational controversies or conduct in one country regarded as unethical in many others. In the mid-1950s, the International Astronomical Union, the global association of astronomers issued statements criticizing the US government's planned Project Westford involving the launch of a large number of long, narrow metal rods ("space needles") into space to determine whether they could be used to relay radio signals to different places on earth where the curvature of Earth prevented direct transmission. Astronomers were concerned the needles would interfere with radio astronomy and the AIU's statements were helpful in triggering more public debate, though technological obsolescence was more important in the ending of the project.[14] Widespread media and other reports that the Soviet government was dealing with lesser known political dissidents by having them declared insane and confined to mental institutions led the Soviet All-Union Society of Psychiatrists and Narcologists to resign from the World Psychiatric Association rather than continue to face its criticisms. The All-Union Society sought readmission in 1989, but the WPA made readmission conditional on a visit and favorable report from a WPA monitoring team. The process had not been completed before the USSR dissolved in December 1991.[15]

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[14] See C. Wilfred Jenks, *Space Law* (London: Stevens and Sons, 1965) p35-36.

[15] Felicity Barringer, "Soviet article says psychiatry was abused in 70s," *New York Times* 22 Nov. 1989, p. 9; F. Kondrat'ev, "Soviet psychiatry," *Russian Social Science Review* 36/6: 74-90 (Nov/Dec 1995);"News and Comment: Soviet Psychiatry, *The Lancet* 338 (no. 8767): 626-627 (9 July 1991).

IDEESE Module 1.2 Resources

Roots of Interconnection: Communications, Transportation and Phases of the Industrial Revolution

MJ Peterson
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Transnational ethical conflicts are more frequent in the contemporary world and because of the greater interconnection among societies. Though scientists and engineers have maintained active contact with colleagues in other countries for centuries, until recent decades such contacts were limited to periods of study at a foreign university, occasional collaboration in labs or on projects, and exchange of research results through publication or presentation at conferences. As societies became more interconnected, the patterns of joint activity deepened. At the same time, the impacts of science and engineering were felt more deeply in society as the connections between basic science on one side and applied science, technology, and engineering of human-made structures became stronger.

Two sets of technological changes increased the possibilities for interconnection between societies by increasing the speed of and broadening access to communications and transportation. The changes in communication took hold more quickly, but both were important to increasing the possibility for interaction among members of different societies.

With invention of the telegraph in the 1840s messages could travel from point-to-point at the speed of shifting electrons rather than of galloping horses or relays of visual signals from tower to tower. Basic transmission time between Paris and London went from days (horses) or hours (visual relay) to minutes. However, the need to receive the messages in a special telegraph office, copy the text onto paper, and then either deliver the paper to the recipient or have the recipient come by to pick it up meant that total message time was longer for anyone who did not have a telegraph office on-site. Initially telegrams were also expensive enough that their use was limited to government agencies, large business firms, and relatively wealthy individuals. Mass publics began to benefit from telegraphs in the 1860s and 1870s as newspapers expanded their use of telegraphic news services to get stories from distant locales. This roughly coincided with a further expansion of literacy and development (using steam driven presses) of newspapers inexpensive enough for lower middle class, worker, and small farmer households. These developments reinforced one another: without wider literacy fewer people would have an interest in newspapers but without lower prices the newly-literate would have less access to reading material.

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Development of radio in the 1920s and television in the 1950s into mass media meant that audio and visual signals traveling through the air at the speed of sound could spread information to large audiences simultaneously. Governments, broadcasters, and equipment manufacturers all had reason to encourage purchase of radios and televisions, and the cost of basic radios or TVs was soon low enough for most households in industrial countries to have them. The smaller, more portable versions of the 1960s and 1970s made them widely available in developing countries as well. Yet, like newspapers, radio and television broadcasts were one-way media. The publisher or broadcaster could send messages to many people but individual readers, listeners, or viewers could only contact their fellow audience members through face-to-face conversation or the occasional publication of a letter to the editor in the newspaper or the inclusion of listener or watcher comments on the radio or television station.

Telephone services, which first emerged in the late 19th century and expanded considerably after World War I, allowed possessors of telephones to contact each other, but phone service remained fairly expensive,[16] available only to a minority of households even in the industrial countries until after World War II. In many developing countries, access to phone service remained extremely uneven through the 1980s. Only after 1990, as more governments realized the economic importance of extending phone service, and as satellite technology and then cellphones made it possible to connect users without building a nationwide wire network, did differences in access begin to narrow.

Yet, telephones (even cellphones) only link pairs or small groups of users; they do not provide a way for large numbers of people to communicate back and forth simultaneously. Such capability began to develop in the 1990s as the Internet emerged from being a small set of computer connections between specialized users in the USA and Western Europe to the vast world wide web of today. The Internet allows rapid communication among large numbers of users, whether they are accessing someone else's site, running their own site, reading or posting blogs, or interacting on social sites or chat rooms. The Internet has been a great leveler, allowing individuals and small groups the same possibilities of communicating open to governments and other large organizations. Wireless technologies can carry Internet data, though not at quite the same speed as broadband fiberoptic cables, and the same differences in access that affect telephones also affect the Internet.

Even in industrial countries, where Internet access is more widespread than in developing ones, newspapers, radio, and TV coexist with the Internet. Individuals move back and forth among the various media when seeking information. Thus, the older patterns of one-way distribution and of two or small group conversations coexist with the new Internet pattern of multi-party and multiple-direction participation.

These advances in communication have sped up the transmission of new scientific and engineering knowledge, reducing the gap between what is known in the leading laboratories or research centers and what is known elsewhere. Videoconferencing over the telephone network, a merger of telephone and TV technologies made possible by replacement of copper wires with broadband fiberoptic cables, created some possibilities but these facilities were restricted to those who could afford the special equipment required. The addition of webcams to computers opened videoconferencing to anyone with access to the Internet and a computer with video capabilities. These are now sufficiently inexpensive that even households can engage in videoconferencing; small labs, independent inventors, and individual engineers

[16] Particularly long distance service. Correcting prices for inflation by using 1990 dollars, a three-minute call from New York to London cost $244.65 in 1030 and $188.51 in 1940, and $3.32 in 1990. R.J. Herring and R. E. Litan. 1989. *Financial Regulation in the Global Economy* (Washington, DC: Brookings Institution).

can certainly take advantage. The Internet has also changed scientific publishing. It offered the possibility of getting research results out to colleagues and the public more rapidly than was the case with traditional publishing. It also allowed more effective by-passing of peer review systems, with the potential of challenging the whole system. After some initial hesitations, the major journals accommodated the Internet by posting accepted articles online prior to or simultaneously with publication in the traditional hardcopy format and maintaining electronic archives of past issues.

Deeper collaboration among scientists and engineers in different countries was greatly facilitated by changes in transportation technology. In the 18th century a scientist visiting a colleague in another country had to travel overland in a coach, spending nights in Inns (sharing rooms and sometimes even beds with other travelers) and needing days or weeks to get to the destination. Journeys across a body of water required taking passage on a ship. This also involved rather cramped accommodations, but ships could travel more rapidly than coaches, and (seasickness aside) were more comfortable. Thus, scientists who lived in cities close to a port often preferred sea routes. In North America, for instance, more people traveled between Boston and New York by sea than over the always bumpy and sometimes impassibly muddy roads that would be traversed if going by land. Only with construction of a New York to Boston rail line in 1830s did more people start going by land.

Application of steam technology to transportation in the 19th century increased the speed of travel and increased the size of vehicles, making trips both quicker and more comfortable. Opening of the major interoceanic canals – the Suez Canal in 1869 and the Panama Canal in 1915 – further reduced travel times at sea by replacing the long voyages around the tip of Africa or South America with shortcuts through the Mediterranean or Caribbean. The voyage from England to India, which had taken months in the 18th century, was reduced to weeks in the 19th. The Panama Canal shortened travel between Europe or the east coast of North America to the west coast of South America, or between Asia and the east coast of North America. It had less effect on travel between New York and San Francisco, because the Transcontinental Railroad completed the link between the two in 1867. It was the most dramatic railway project of its time, but was soon followed by other continental-scale efforts as well as further development of shorter railways between major cities. Railroads were the first technology closing the gap in speed between sea and land travel; motor vehicles would do the same, but not until paved highways were constructed in the 1920s and 1930s did motor vehicles become a viable form of long haul transportation.

Trains and steamships, particularly as they became larger and therefore capable of carrying more passengers, reduced the cost of travel to the point that large numbers of students and junior scientists – not just the well-established senior researchers – could afford to go further than immediately neighboring countries. The same increase in the capacity, applied to freight cars and freight-carrying ships, also reduced the cost of transporting goods over long distances, vastly expanding opportunities in international trade. Rather than being confined to relatively light and high-value goods, such as gold, ivory, spices, and porcelain, it was now feasible to ship grain, meat, and a much larger range of raw materials across oceans and continents. Today's long distance food trade is an elaboration on patterns developed in the 19th century, when bulk carriers allowed US and Canadian wheat to be sold in Europe more cheaply than European crops and refrigerator freighters allowed transport of meat (rather than live cattle) from Argentina to Europe.

Transportation speeded up yet again in the 20th century with development of aviation. The true revolution, the opening of air travel to wide sections of the population, came with development of jet aircraft. They

could be made large enough and get from place to place quickly enough to bring the price of air travel down to levels making it available to most of the population in industrial countries and increasing fractions of the population in developing ones. Aviation now does for travel much of what the internet does for communications – make feasible a much thicker set of face to face interactions among participants from all continents.

While these developments in communication and transportation were expanding the possibilities of personal contacts around the world, changes in the patterns of economic activity that they helped encourage were creating a much denser set of economic transactions across national borders. The new communications and transportation technologies were both products of and contributors to the successive phases of the industrial revolution. They were more products of the first phase, the relatively small-scale hit-or-miss changes of the first phase, but contributed to the second, third, and fourth phases.

The first phase of industrial activity emerged in England, then spread to Belgium, the Netherlands, northern France, the northwestern German states, and the USA. In this phase, factories were relatively small and products developed through a process of trial and error in which the proprietor, skilled workman, or more specialized "mechanics" made incremental modifications to machinery, production processes, and product design. In many enterprises, manufacturing remained close to the word's origin a combination of "hand" and "make" because cloth making machinery had to be tended closely and other production depended on considerable adjustment of parts to fit together. In society as a whole, the large numbers of these enterprises shifted the balance between urban and rural areas. In 1760, a bit more than 50% of the male workforce was engaged in farming and 25% in pre-industrial versions of goods production; in 1840 the proportions were reversed. Cities held 21% of the British population in 1760, and 48% in 1840. Though traditional craft production continued in building construction, furniture-making, tailoring, shoe-making, and gunsmithing, centralizing production in a factory with all the machinery run from a central power plant and workers' hours of work, break, and home life determined by the factory whistle characterized the rising textile and iron industries. As new inventions followed, it became possible to produce a widening range of goods – including many that had not existed before – in factories. We are so accustomed to clothing factories today, that our images of clothing production often extend them back to the late 1700s; however, they were not really feasible until invention of sewing machines in the 1850s.

The second phase of industrial activity started in the mid-19th century, primarily in Germany and the USA, and was characterized by three developments: more conscious application of new scientific knowledge to process and product design, greater volume and economy of production through standardized parts and final products, and larger size of factories or other industrial plants. The German dye industry was the first to systematically apply scientific knowledge – in its case chemistry – to the development of new products. The brighter and more stable synthetic dyes it produced soon dominated the market, and synthetic dye manufacturers emerged in other countries as well. Similar efforts to search for and consciously apply relevant basic scientific knowledge also appeared in the steel industry, where chemists were hired to analyze the composition of newly made steel, identify more reliable ways to eliminate impurities, and even develop new alloys that would strengthen the material, reduce its tendency to rust, or provide other desired characteristics.

The other significant technological development of this period, truly interchangeable parts, was less directly tied to science but did rest on advances in machine-making, including use of harder, and therefore more stable, metals in machines. This production process is so familiar to us – it is our basic image of

"manufacturing" – that the difficulty of making component parts to such close tolerances that an assembler can pick up any one of several parts in a bin, insert it in its proper place in the larger product, and be confident that the larger product will work reliably with the technologies of the early 19th century is obscured from view. Part of the reason craft workshops continued to dominate in so many areas was that production involved a lot of trimming and adjusting so parts would work together. Interchangeable parts eliminated that extra work, facilitated repairs, and also allowed using less skilled workers. Fully interchangeable parts were first developed in the USA, so their use was long known as the "American system of manufacturing."

Continuing technological development encouraged growth of larger factories, metal refineries, and textile mills. These larger facilities cost more, transforming the system of financing industry. In Britain and the USA, much of the finance came from factory owners and their friends or associates. In the 1830s the Belgian *Société Générale*, a government-backed investment bank provided much of the capital, and bank finance was so central to German industrialization in the later part of the 19th century that the tradition of including a bank representative on the board of directors became firmly established. The industrial combines (*zaibatsu*) that emerged in Japan in the late 19th century typically included a bank, which was expected to help finance the other affiliated companies when necessary. These differences established an enduring difference in management styles between "Anglo-American," "European" (or "continental") and Japanese business management because the first were more accountable to shareholders and the shorter-term time horizons of quarterly reports than the latter two.

Though the first phases of the industrial revolution provided new ranges of goods, many of them remained beyond the reach of the working class. Though controversy about the impact of industrialization on workers and poor farmers continues, there is consensus that these groups did not share much of the gain in national and per capita income. Only with the second phase of the industrial revolution did the position of industrial workers begin to improve, and that was usually the result of government measures, such as Factories Acts regulating hours and conditions of work, wage laws, and government-provided social insurance, brought about through pressure from the growing working classes (as in England) or through decisions by governments seeking to reduce support for the more radical socialist and syndicalist movements (as in Germany). A few, like Robert Owen in England and Fourier in France sought to organize industry in a cooperative fashion, but the hierarchical factory remained the main form of industrial organization. Individual manufacturers seeking to sell their goods at a profit had three cost-management strategies available – more efficient use of materials, more efficient production processes, and containing wages – and used all of them in varying degrees. The urge to contain wages was checked by the market in good times because an employer would have to pay attractive wages to recruit and keep workers, but not in bad, leading workers to suffer particularly sharply in economic slowdowns.

Early industrial goods were fairly simple, the buyer could usually evaluate their quality and understand how they worked on his or her own. By 1914, this was becoming less true, the average buyer could understand how electricity worked and what components were required to establish electric lighting, but could not evaluate the quality or safety of the wires and lighting fixtures. The same problem of evaluating quality was even more severe in areas of food and medicine, where the items came pre-packaged and could not be sniffed or tasted before purchase. Thus buyers had to rely on reputation the manufacturer, and find some way to distinguish the companies that cut too many corners on quality to compete on price from those that did not. Trademarks became important not just as advertising devices (though they were that) but also as signals to the consumer about the goods. Yet, trademarks were not a complete assurance. Even with the greater understanding germ transmission and good hygiene stemming from advances in medical sciences,

food processing and drug manufacture often involved dangerous practices. As more people came to rely on pre-packaged foods and medicines, as well as on manufactured goods, government safety agencies, independent testing labs, and consumer organizations sought through legal regulations or privately issued standards to assure certain basic safety and quality levels. The challenges of doing so only increased with the later phases of industrialization.

The third phase of industrialization – the conscious combination of highly efficient mass production with mass sales of products – began with Henry Ford's decisions to design an automobile that could be produced at a price within reach of the middle class and to pay his workers a higher than prevailing wage. Though a staunch opponent of labor unions (part of the reason for high wages was to keep unions out of the factories) Ford articulated a vision of an industrial society that used large, highly organized assembly lines to produce a high volume of goods at prices most people could afford. He would make money not by selling some goods having a high profit margin to the wealthier strata but by selling large numbers of goods having a smaller profit margin to almost all. This combination of high production and widespread consumption existed in some areas before Ford, but his tireless advocacy of the idea helped it spread through much of the US economy by 1929 and into some European industries. Even the Soviet government embraced the basic high production/wide consumption idea, though did not put significant efforts into consumer goods production until the 1950s.[17]

By 1900 educated people in all parts of the world regarded industrialization with something they wanted themselves. Yet, countries beginning on the path of industrialization faced significant obstacles because well-established firms had the financial resources, physical facilities, and know-how to out-compete newcomers. Industrialists and governments responded to the challenge in various ways. Some sought to develop through collaboration with established firms. Some lobbied for or were offered subsidies and tariff protection by the government. In adopting a Marxist Leninist programs, the Soviet Union took the process even further by establishing central planning and directing a massive industrialization. Russia had begun to industrialize before World War I, but the country was still primarily agrarian and rather backward technologically. The new Bolshevik rulers sought to prove that socialism would be a superior form than capitalism by demonstrating to the world that he determines that central planners could industrialize a country more quickly, more efficiently, and more effectively than in countries where private firms made the economic decisions, while also avoiding the severe exploitation of workers that had marked the earliest phases of Industrial Revolution.

Soviet industrial accomplishments between 1928 and 1940 were considerable and attracted attention around the world. The Soviet Union appeared to have avoided the worst of the great Depression and clearly held off Hitler's legions, so in 1945 its model appeared to be an effective alternative to capitalist industrial development. Simultaneously, politicians, intellectuals, and labor movements in Western countries were modifying their own countries' economic organizations. The laissez-faire of the 19th century was replaced by a combination of the welfare state-- that is, using tax revenues and government programs of health insurance, old age pension, and unemployment compensation to provide everyone with a basic minimum standard of living -- with a mixed economy – one in which the "key" industrial sectors would be operated by state-owned enterprises while others were left in private hands. The state-owned enterprises were expected to be models of good industrial relations between management and labor while providing

[17] Even Marxist economists joined the analytical homage that refers to the mass production-mass consumption scheme of economic organization as "Fordism."

society as a whole with goods and services at more reasonable cost because they would not insist on as high a profit margin as private investors and owners. In sum, whether led by a center party, a labor Party or a social democratic party, Western European countries transformed themselves into mixed economies that they hoped would combine the advantages of planning with private initiative while avoiding their disadvantages. Individually or together Soviet and Western European influences inspired governments of Latin America, Africa, the Middle East, and Asia to adopt similar systems in the expectation that they, too, could achieve rapid industrialization and allow their populations to enjoy the same material comforts enjoyed in the industrial West.

If the character of industry had remained what it was in 1945, a combination of mass production and mass consumption of goods based on late 19th and early 20th-century technologies, these centralized designs for catch-up would have been reasonably successful if competently administered. Administrative competence varied considerably, but an equally important factor in frustrating the plans – more important than the continued advantages help by established industries in global competition – was the transition to a fourth phase of industry. This phase consisted of massive change in the organization of service provision, office activity, and production brought about by the computer revolution. It started slowly in the late 1970s as computers became cheap enough for larger business firms to use on a regular basis, but gathered speed as the price and capacity of small computers continued down and dominated the economic scene by the mid 1990s.

In production, computer technologies allowed more precise machining or molding of parts as computer-driven robots replaced human operators; they also permitted shifting from long assembly lines making exact copies of one product to shorter production runs in which products could be differentiated by inclusion of different sub-assemblies or components or different casings. The initial result was "batch production," assembly of sets of differentiated versions; the ultimate result was individualized assembly with each order given an assembly ticket and the parts tracked by bar codes. Though dreams of the "paperless office" have not yet been realized, computer-based systems do permit maintaining and using richer databases about customers, clients, and their likely needs.

In the 1980s, these new production and office systems were available only to fairly large firms because computers were expensive. As computer capacity increased and computer costs decreased, medium-sized and small firms were also able to take advantage of the new production and data management technologies. To do so, however, firms needed to have room to experiment. It is telling that Soviet analysts had some of the best insights into the likely consequences of what they called the "scientific-technological revolution" computers were producing, but the Soviet economy was unable to incorporate computer technology effectively. Some of the problem was political – the Soviet government was worried about letting people connect up and communicate through computers – but much of it was organizational. Companies in the West and the developing world also had trouble adjusting, and many once-famous firms disappeared because they could not make the transition.

The same changes in the relation between science and industry extended into the relation between science and warfare. The search for better weapons, tactics, and strategies in war is almost as old as war itself, and often attracted the best minds of the time. Until the 19th century, weapons development relied primarily on trial and error, typically featuring incremental changes except when a new type of weapon was introduced. Tactics and strategy, being matters of organization rather than making physical objects, could and often did feature larger change.

Development of industrial technologies for manufacturing, communications, and transportation transformed warfare in the 19th century. Canning of food (perfected during the Napoleonic Wars) and factory manufacture of weapons and equipment permitted supporting larger armies in the field, while the wealth generated by industrial activity expanded national tax bases sufficiently to support those forces. Steamships increased the speed, size, and gun-carrying capacity of warships while shifting naval concern from dependence on the winds to dependence on fuels and refueling stations. Railways permitted moving troops much more quickly, and armies soon learned to replace the physical conditioning once provided on the march with increased physical activity during training and drill.

The link between advances in basic science and development of new industrial technologies was extended to military technologies as well. Military medical units and individual weapons-makers were already drawing on scientific knowledge in the late 19th century, but this depended largely on decisions by individual units or firms. Systematic efforts by military high commands or high officials of defense ministries to coordinate use of scientific talent in development of weapons and equipment first appeared during World War I. Most of these efforts were wound up in 1918-19, and had to be reestablished in the mid-late 1930s as a new world war appeared more and more likely. Onset of the Cold War competition meant there was no comparable winding-up after 1945; later, the existing military-science-industry connections were intensified in all the major military powers. The rush to develop nuclear weapons, which absorbed considerable resources in the USA, Britain, Germany, the USSR, and Japan alike, was not the harbinger of a new relation between science and military technology, though it did reveal more clearly than any other 20th century development, the vast capacities for destruction being developed as countries engaged in "total war" bringing their full productive capacities to bear in supporting vast armies and far-flung campaigns.

Military establishments were quick to realize the relevance of computers and information technology in planning, intelligence gathering and analysis, maintenance of command and communication, and locating enemies on the battlefield. Several information technologies, including early versions of the internet, satellite-based remote sensing systems, and satellite navigation systems, were developed for military use and then extended into civilian applications. Like society in general, militaries around the world face the challenges of effectively absorbing rapidly changing computer and information technologies.

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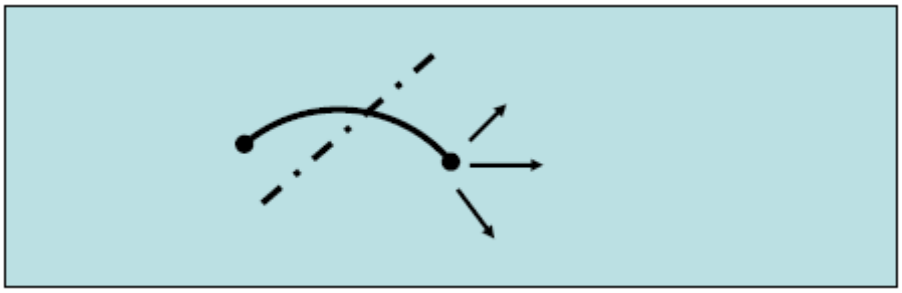
IDEESE Module 1.2 Resources

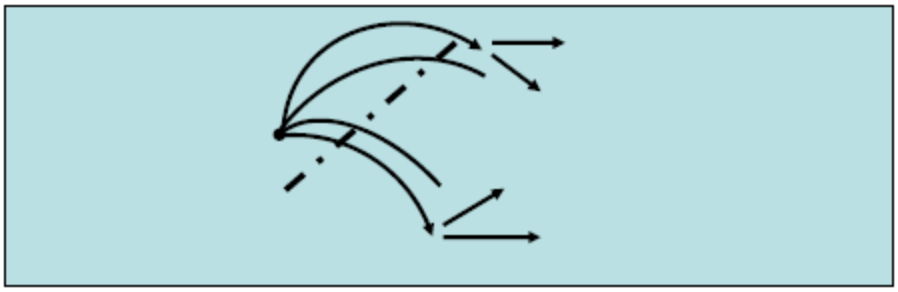
Diagrams of Transnational Diffusion

MJ Peterson
Version 1; September 2008

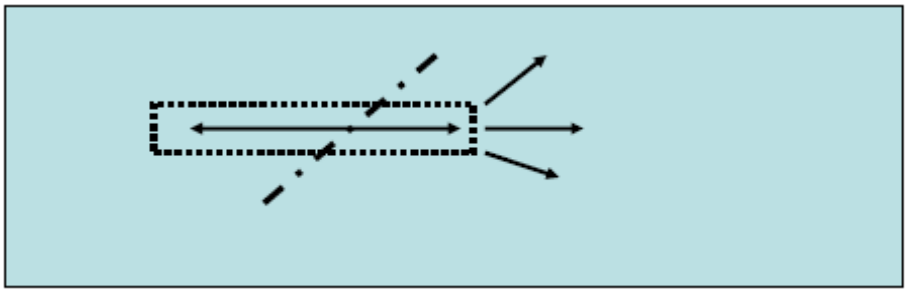
TRANSNATIONAL DIFFUSION OF ETHICAL STANDARDS



Diffusion of foreign standards from employment in or contact with foreign-owned or -organized entity



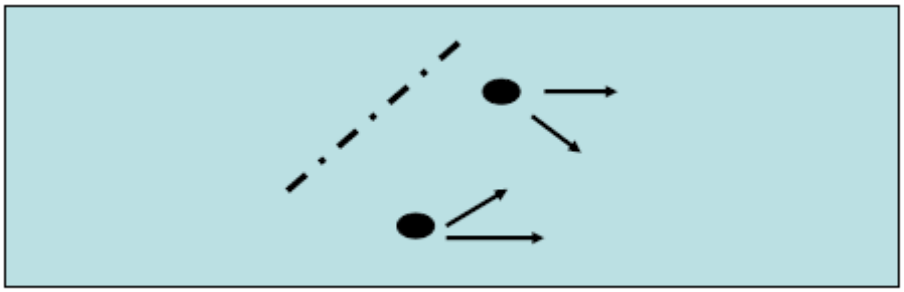
Diffusion of foreign standards by locals after return from foreign education or employment



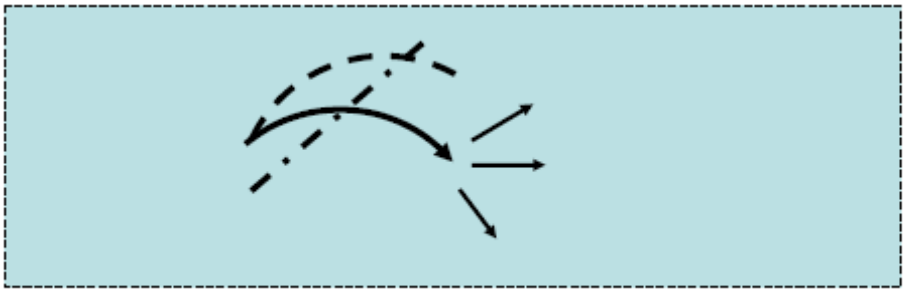
Diffusion of foreign standards learned in professional association

This module was created by the International Dimensions of Ethics Education in Science and Engineering (IDEESE) Project at the University of Massachusetts Amherst with support from the National Science Foundation under grant number 0734887. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. More information about the IDEESE can be found at http://www.umass.edu/sts/ethics.

This case should be cited as: M.J. Peterson. 2008. "Diagrams of Transnational Diffusion." International Dimensions of Ethics Education in Science and Engineering. Available www.umass.edu/sts/ethics.

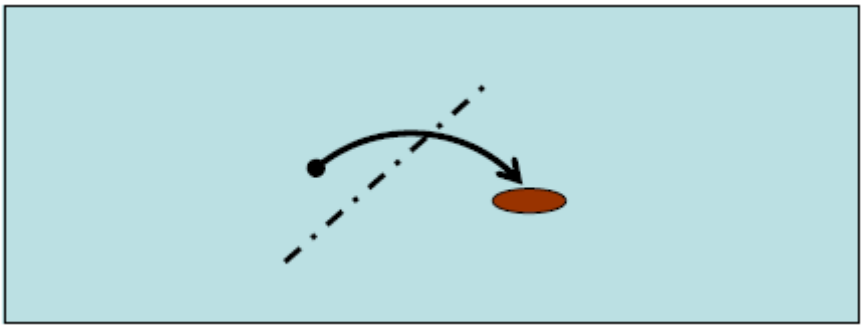


Diffusion of foreign standards by locals who learn of them through Internet, broadcast or print sources

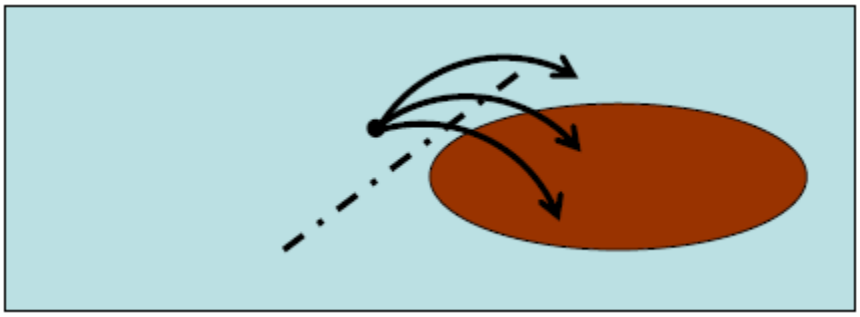


Re-diffusion of local-Re-diffusion of local origin standards in form preserved or modified abroad

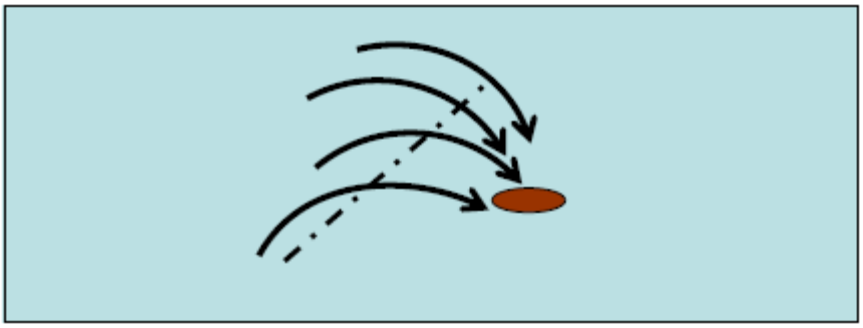
TRANSNATIONAL DIFFUSION OF PHYSICAL EFFECTS



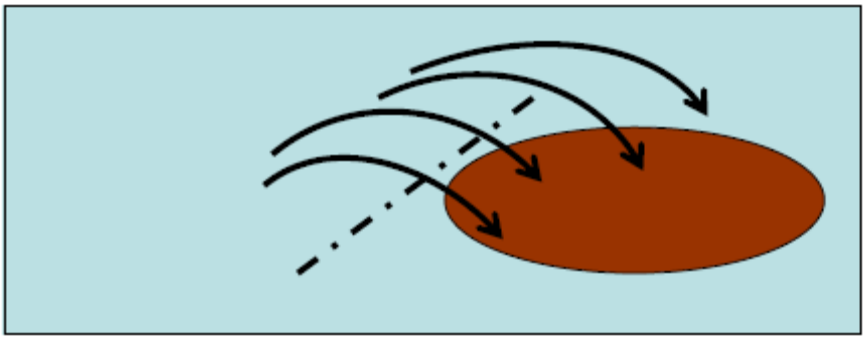
From a point source to a limited area



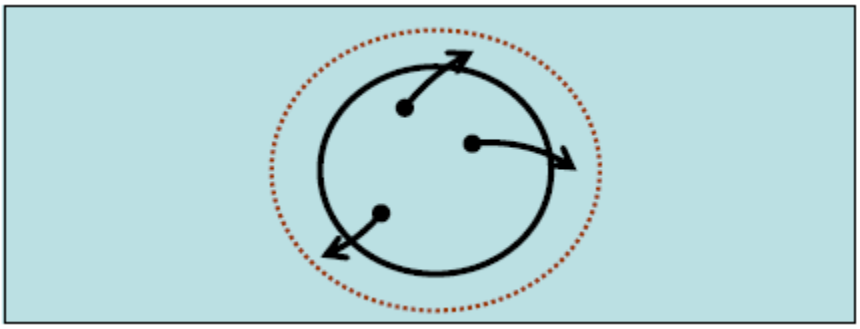
From a point source to a wide area



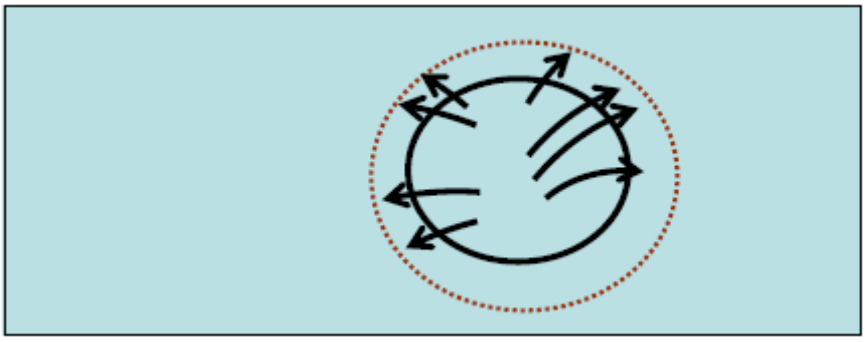
From dispersed sources
to a limited area



From dispersed sources
to a wide area



From multiple point sources
to a global effect



From multiple dispersed
sources to a global effect

<end>

IDEESE Module 1.2 Resources

In Class Evaluation

Version 2; July 2010

Part 1: The following are some possible response you might have to the material in this Module. Please circle the response that is closest to your thoughts after this module.

Key	
SA	Strongly Agree
A	Agree
UN	Undecided
D	Disagree
SD	Strongly Disagree

Statement	Your Response				
1. I now realize that there is a lot more communication and interconnectedness between countries than I realized.	SA	A	UN	D	SD
2. I do not think that it is very important for scientists/ engineers to pay attention to the international aspects of their work.	SA	A	UN	D	SD
3. I realize that my career will probably have some global or international aspects.	SA	A	UN	D	SD
4. I now realize there are more social implications related to my career than I thought about previously.	SA	A	UN	D	SD
5. I am more aware that the work I might do will involve ethical as well as technical choices.	SA	A	UN	D	SD
6. I am more aware now of the complications related to different ethical expectations in different countries.	SA	A	UN	D	SD
7. I feel there should be one set of ethical guidelines developed that could be used to guide the work of scientists/engineers, regardless of the country in which they work.	SA	A	UN	D	SD
8. I feel that each culture has its own ethical standards, and those standards should not be dictated by other cultures or countries.	SA	A	UN	D	SD
9. I think that ethical guidelines should be a part of international treaties.	SA	A	UN	D	SD
10. I think that it is sufficient for an international company to comply with each nation's ethical standards, independent of the location of the company's headquarters.	SA	A	UN	D	SD

Part 2: In this section, please identify one specific example that you remember as having the most impact on you. Please leave the line blank if nothing seems relevant.

1. Increased intercommunication that exists now between countries.

_____

2. Social implications of work done by scientists and engineers.

_____

3. Decisions about ethics in relation to different countries.

_____

4. Any other specific ideas that were important to you from this module.

_____

<end>

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