

IDEESE Module 1.3b

Transnational Conduct

MJ Peterson
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Learning Objectives

Students will be able to:

1. Understand the concept of “culture” and some general dimensions on which cultures differ.
2. Understand the range of responses to differences in local ethical or regulatory standards.
3. Understand the effects of politically-motivated censorship on acquisition and spread of scientific and engineering knowledge.

Outline for In-class Discussion

I. Variation in Cultures

- A. Ask students to identify the similarities of and differences between cultural generalizations and stereotypes.
- B. Ask students to identify some of the dimensions on which cultures differ.

The dimensions mentioned in the background reading are:

- 1.) high context/low context
- 2.) polychronic/monochronic
- 3.) future/present/past orientation
- 4.) unlimited time/limited time
- 5.) control/harmony/constraint
- 6.) individualist/communal
- 7.) vertical/horizontal (or hierarchical/egalitarian)
- 8.) doing/being

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- 9.) assertive/nonassertive
- 10.) centralized/decentralized
- 11.) holistic/analytical (or systemic/linear)

- C. Ask students to name countries where they think the culture favors a particular orientation on that dimension (for instance, countries with a high context and countries with a low context style).

II. Sources of Differences in Standards

- A. Ask students to identify the sources of differences in standards. Answers include:
 - 1.) differences in ethical beliefs
 - 2.) differences in perception of risk
 - 3.) differences in reaction to new scientific knowledge or technological invention.
- B. Ask students to identify the various ways societies can deal with activity or material things regarded as hazardous. Answers include:
 - 1.) ban
 - 2.) restrict activity or use to particular occasions or applications
 - 3.) license producers and/or users
 - 4.) impose strong liability rules on producers and/or users
- C. Ask if anyone can provide examples of different countries reacting to the same activity in different ways. Encourage discussion of why those countries might have made their different choices.
- D. Remind students that companies, organizations, and individuals operating in more than one country can deal with differences in standards by choosing to carry out activity where regulations are least demanding, adapting activity to the rules in each location where it occurs, or following the demanding regulations everywhere.

Ask students if they know examples of each sort of choice and encourage discussion of why the choice was made.

III. Variations in Information Control

- A. Ask students to explain why governments, corporations, and social groups might want to control the spread of scientific and technical information. Answers include:
 - 1.) Governments: remain in power, order society along lines of preferred political ideology.
 - 2.) Corporations: avoid dissemination of negative information about products or production processes that might reduce sales; keep others from using inventions the

company has spend money, time, and other resources on developing without paying for use.

- 3.) Social groups: limit spread of information challenging their leaders' positions on moral, ethical, or practice issues.
- B. Ask students to identify ways in which those who want to get hold of information can do so. These could include:
- 1.) Getting it from contacts in other countries where its circulation is legal
 - 2.) Accessing it on foreign websites
 - 3.) Getting it from opposition political parties or other social groups
- C. Ask students when those efforts are and are not likely to be successful.

They should be able to work towards conclusions that the methods work if they are available – if Internet access is severely controlled, there are no opposition parties, or there are no social groups with different views then it will be much harder or even impossible to access desired information.

They should also be able to work towards a realization that seeking information assumes a person can identify the sort of information they need and where it might be found.

Notes for instructors

This module can be taught using all three sections or by omitting the third, which could be used alone in conjunction with case studies featuring discussion of patents or restriction of access to information.

Students in most graduate and many undergraduate classes are likely to be drawn from different countries, and many are likely to have traveled in countries other than their own. This means they should have plenty of examples for discussion of cultural differences. It may take them longer to think of examples for discussion of different responses to different ways of regulating activity; encourage them to think beyond scientific and technical areas if they are having trouble, then bring them back to those areas.

Students in the sciences could be encouraged to think about why governments generally do not have government examination boards that license scientists but allow already established scientists to determine who qualifies to work as a scientist or lab assistant. They could also think about how careers can come to an involuntary end. Engineers may have their license revoked if the relevant examination board determines that they have failed to meet basic expectations about the quality of their work and safety of the structures they design. What happens to scientists who do poor work?

Suggested Case Studies

"Recruitment of Egg Donors by South Korean Stem Cell Researchers" International Dimensions of Ethics Education in Science and Engineering Case Study Series. <http://umass.edu/sts/ethics>

Resources Included with this Module

1. [Efforts to Control Information Flows](#)
2. [Cultural Competence in a Transnational Workplace](#)
3. [Transnational Differences in Ethical and Regulatory Standards](#)
4. [Hints on Cross Cultural Skills](#)
5. [Recommended Readings](#)

Recommended Readings for Students

For assignment prior to class discussion

1. Cross-cultural Workplace [included in this module]
2. Variation of Regulation [included in this module]
3. Information Control [included in this module]
4. Case Materials [as determined by choice of case]

Recommended readings for Instructors

1. Hints on Cross-Cultural Skills [included with this module]

Other Resources

For students and instructors interested in further exploration of cross-cultural differences

1. List of readings on cross-cultural differences [included in this module]
2. List of websites with materials on cross-cultural differences [included in this module]

IDEESE Module 1.3b Resources

Efforts to Control Information Flows

MJ Peterson with research assistance from Ilke Ercan
Version 1; July 2009

I. Introduction

Both science and engineering have strong traditions of sharing information with colleagues, whether they work in the same laboratory, in one down the road, or in one half way around the world. Though willing to curb information sharing in times of national danger, both professions affirm strong norms of openness and information sharing.

These sometimes come up against desires by governments, corporations, or other groups to limit the diffusion of scientific and technical information. Some of these limits form part of an effort to control who has what information through general censorship. Efforts to secure control over who may use particular information in their own work have become increasingly important since the mid-20th century as intellectual property rights protected by patents or copyright have become more important to corporate business strategies. This has triggered intense debate about how to draw the longstanding distinction between “basic scientific knowledge” available to all and “applied science advances” treated as private property under patent, copyright, and other forms of intellectual property rights. Though the types of information control are perceived similar in many ways, the ambition to block diffusion of information is qualitatively different than the ambition to block use. Hence, each form of information control will be addressed in turn.

II. Efforts to Control Access to Information

Censorship has long been part of authoritarian rulers’ repertoire of measures for maintaining their position. Individuals and groups using words, images, songs, and protests to challenge the ruler’s position are the most frequent and immediate targets of censorship, but censorship can extend to the population at large whenever rulers perceive dissemination of particular information or knowledge as dangerous to the regime. Geneva vigorously censored religious publications in 1541-64 to suppress any challenges to John Calvin’s interpretations of Christian scripture and doctrine. Contemporary China classifies information about epidemics or other developments that might cause discontent among the population as state secrets. Scientific or engineering knowledge may also be subject to censorship. This is particularly likely in wartime,

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when governments do not want enemies to find out about advances in applied science or engineering producing better weapons, intelligence gathering, or logistics.

The continuing division of the world into independent states means that no one government or society can exert global control over the flow of information about science, engineering, and advances in scientific or technical knowledge. US efforts to maintain the secrecy of the Manhattan Project developing the atomic bomb succeeded against the Germans and Japanese, but not against the USSR, which exploded its own atomic bomb in August 1949. However, enough information was available in the open scientific literature and the fact that the USA had succeeded in making atomic bombs for others to emulate the feat. Even without any of the information provided by its spies, the USSR would have been able to create its own atomic bomb by 1951, and would have had one faster if it had begun to assemble large quantities of uranium in 1943 rather than 1945.¹ Scientific traditions of open publication mean that information about scientific and engineering advances will be available to those with sufficient training and sufficient access to foreign scientific publications to read it.

Yet, to the extent that a government can control access to information on its territory, or other actors can affect the spread of information in their societies, they can limit the ability of scientists and engineers in that country to keep up with developments elsewhere or to pursue research in the ways they would prefer. The Lysenko Affair in the Soviet Union suggests how far a sufficiently motivated government can deflect the course of scientific activity with censorship and political pressure. Soviet geneticists were already regarded as overly subservient to “bourgeois” notions of science in the 1930s when Trofim Denisovich Lysenko began his rise to prominence through experiments suggesting that it was possible to alter the growing season of plants by exposing their seeds to particular combinations of temperature and moisture before planting. As one of the few biologists of a peasant background and fully committed to socialism, he quickly became an exemplar for Communist Party members most committed to building new “socialist” sciences. His influence spread after 1935, particularly after he became President of the Lenin Academy of Agricultural Sciences in February 1938. In 1948, the Communist Party Central Committee endorsed Lysenko’s Theory of Nutrients which posited that in the environment in which an organism lives ultimately shapes its heredity and genetic evolution, returning to strong assertions that the heritability of acquired characteristics allowed guiding the evolution of species that had been abandoned by most geneticists in the 1910s. In endorsing Lysenko’s work plan for the Lenin Academy, the Party Central Committee also suppressed research and teaching of standard genetics. Support from Stalin and Khrushchev enabled Lysenko and his followers to dominate Soviet agronomy and genetics until 1965, yet even at the height of their influence they were not able to completely eliminate standard genetics. Genetics advances in other countries were known to the Soviet scientific elite and a core of geneticists were able to continue enough research within institutes of theoretical physics (because of the relation between radioactivity and mutation) and cybernetics (because of apparent similarities between genetics and information theory) to reconstitute their field after Lysenko’s definitive loss of influence in 1965.² Other areas of science did not suffer as greatly. Physics and engineering received great boosts from Soviet nuclear and space programs;

¹ David Holloway, *Stalin and the Bomb: The Soviet Union and Atomic Energy 1939-1956*, 222-223. New Haven: Yale University Press, 1994.

² Zhores Medvedev, *The Rise and Fall of T.D. Lysenko* (New York: 1969) and Valery M. Soyfer, *Lysenko and the Tragedy of Soviet Science* (New Brunswick, NJ: Rutgers University Press, 1994).

cybernetics and information theory were encouraged on grounds their application would facilitate creation of a communist society.³

It would be a mistake to assume that only dictatorial governments engage in censorship of scientific information. Democratic governments can engage in more subtle versions of the same practices. This is particularly likely if a significant portion of their support comes from social groups that have determined views on some matter involving scientific knowledge and push to have the distribution of scientific information conform to – or at least not challenge – their views about proper policy on the matter. In 2002, as the George W. Bush administration was advancing its conservative supporters' "abstinence only" approach to sex education for teenagers, controversy arose over removal from US government health information websites of information about how to avoid sexually-transmitted diseases.⁴

Efforts to control the spread of scientific information can also be pursued by other social actors. Corporations producing hazardous products have often sought to suppress or discredit scientific findings that demonstrate the hazards. The most famous and well-documented example is the long effort by tobacco companies to deny research findings on the health hazards of smoking in the 1950s and 1960s and of exposure to smoke from other people's smoking ("secondhand smoke") in the 1980s and 1990s.⁵ As the number of studies demonstrating serious hazards increased, the major tobacco companies shifted strategy from outright denial of any hazard to casting doubt on the findings by suggesting that the emerging scientific consensus rested on inadequate empirical proof. The most succinct statement of this tactic indicated that, "Doubt is our product, since it is the best means of competing with the 'body of fact' that exists in the mind of the general public."⁶ As the scientific consensus that greenhouse gas emissions were contributing to rising atmospheric temperatures and these would soon have significant effects on the Earth's climate solidified in 2000-05, climate change skeptics in the USA shifted to similar tactics.⁷ In the 1990s there were at least two cases of industry supporters attempting to discredit the research demonstrating the hazards posed by some product by accusing the scientists who produced the research

³Paul Josephson, *Physics and Politics in Revolutionary Russia*, pp. 247-75 Berkeley: University of California Press, 1991 traces the less intense and short-lived effort to inject ideological policing into physics after 1945.

⁴ Adam Clymer, "Critics say government deleted sexual material from websites to push abstinence," *New York Times*, 26 November 2002, and Adam Clymer, "U.S. revises sex information, and a fight goes on," *New York Times* 27 December 2002.

⁵ Stanton A. Glantz, John Slade, Lisa A. Bero, and Peter Hanauer, *The Cigarette Papers* (Berkeley: University of California Press, 1996). Lisa A. Bero, D.E. Barnes, Peter Hanauer, John Slade and Stanton A. Glantz, "Lawyer control of the tobacco industry's external research program: The Brown & Williamson documents," *Journal of the American Medical Association* 274 (3): 241-247 (19 July 1995) focuses particularly on the central role of the lawyers at Brown and Williamson in selecting the scientific projects to be funded by the tobacco industry's Tobacco Industry Research Council.

⁶ Brown & Williamson, "Smoking and health proposal" (undated but most likely written in 1969 according to Glantz, Slade, Bero, and Hanauer 1996), Document 332506 in the collection of documents made public under the 1998 Master Settlement Agreement between the Attorneys-General of 46 US states and the major tobacco companies. The documents are available at <http://www.tobaccodocuments.org> and the Master Settlement Agreement at <http://ag.ca.gov/tobacco/pdf/1msa.pdf> (accessed 1 July 2009).

⁷ Senator James Inhofe (Republican of Oklahoma), "Skeptics' Guide to Debunking Global Warming Alarmism" (2006) is one of the clearer statements. For an assessment of the skeptics' efforts in early 2009 see Andrew C. Revkin, "Skeptics dispute climate worries and each other," *New York Times*, 8 March 2009.

of scientific misconduct. One challenge was raised despite the fact the original work had been reviewed very carefully a decade before,⁸ and was ultimately rejected.⁹

The line between honest disagreement on scientific or technical points and artificially inflated doubt can be fuzzy. Only occasionally does some piece of evidence, like identification of the “ozone hole” over Antarctica in 1985, signal “end of discussion” by confirming one view and disconfirming others even in the eyes of those supporting the now-disconfirmed views.¹⁰ More often, the weight of the scientific evidence shifts more slowly and expert consensus takes longer to coalesce. The best atmospheric scientists still disagreed among themselves about the extent to which increased emission of CO₂ and other greenhouse gasses from human activity was altering the atmosphere and the likelihood that the human-caused changes would in turn affect climate in the 1980s. Corporations whose activities would be affected by measures to cut emissions could point to the research indicating little connection without distorting the scientific discussions. Twenty years later, as consensus among atmospheric scientists that human-caused greenhouse gas emissions are altering atmospheric temperature sufficiently to affect the climate, challenging the connection involved distortion.¹¹ As with secondhand smoke, challenging the results involved a dual track effort of commissioning studies from persons who could be relied upon to report the “correct” conclusions and applying very exacting standards of proof to discredit the “incorrect” conclusions. Invocation of exacting standards has been used so frequently in recent years that the phrase “sound science” is often identified in the USA with efforts by industry groups and others to prevent government regulation of activity through insisting on impossibly exacting standards of scientific proof of a problem before regulations can be issued.¹²

Just as those resisting particular regulations can pass from expressing reasonable doubt to concocting doubt, those supporting particular regulations can pass from expressing reasonable concern to exaggerating the extent to which scientific evidence supports their policy preferences.¹³ Environmentalist groups using scientific rather than animal rights arguments about adoption of a moratorium on commercial whaling in the late 1970s and early 1980s emphasized the minority scientific view that cessation of all catches was needed for whale populations to recover rather than the majority view that catch cessation

⁸ Herbert Needleman, et al. “Deficits in psychological and classroom performance of children with elevated dentine lead levels,” *New England Journal of Medicine* 1979; reviews summarized in Committee on Measuring Lead in Critical Populations, Board on Environmental Studies, and Toxicology, Commission on Life Sciences, National Research Council. *Measuring Lead Exposures in Infants, Children, and other Sensitive Populations*. Washington DC: National Academy Press, 1993.

⁹ Donald Kennedy, *Academic Duty*. Cambridge, MA: Harvard University Press, 1997, pp. 237-238.

¹⁰ Richard E. Benedik, *Ozone Diplomacy: New directions in safeguarding the planet*. Cambridge, MA: Harvard University Press, 1998.

¹¹ See Naomi Oreskes, “The scientific consensus on climate change,” *Science* 306 (no. 5702): 1686- (3 Dec. 2004).

¹² Tactics described in David Vladeck, “Paralysis by analysis: How conservatives plan to kill popular regulation,” *American Prospect* 6 (22): (23 June 1995); Charles N. Herrick and Dale Jamieson, “Junk science and environmental policy: obscuring public debate with misleading discourse,” *Philosophy and Public Policy Quarterly* 21 (2/3): (spring/summer 2001); Thomas McGarity, “Our science is sound science and their science is junk science: science-based strategies for avoiding accountability and responsibility for risk-producing products and activities,” *Kansas Law Review* 52: 897- (June 2004).

¹³ Caroline Harper, “Do the facts matter? NGOs, research, and international advocacy,” in Michael Edwards and John Gaventa, eds. *Global Citizen Action*, 247-58. Boulder, CO: Lynne Rienner, 2001.

was only needed for certain species.¹⁴ The Natural Resources Defense Council stirred considerable controversy in 1989-90 with a report suggesting that children were at higher risk from pesticide residues on apples and vegetables than many scientists believed was actually the case. The combination of “pesticide,” “children,” and “risk” was potent enough politically to get one product, Alar (trade name for daminozide) removed from the market by its maker.¹⁵ Though successful in getting Royal Dutch Shell to bring the Brent Spar oil platform back to England for onshore demolition, Greenpeace UK was later charged with having greatly exaggerated the negative effects of simply toppling the platform into the North Sea. Animal protection groups seeking to maintain a complete ban on trade in ivory have been charged with using exaggerated data about population declines.¹⁶ When there is no broad consensus among the most knowledgeable scientists, two-sided contests of exaggeration can flourish. Debates about genetically modified foods features a good deal of both, with major food companies that sell such products downplaying the risks and some opponents exaggerating the risks.¹⁷ Debates about whether to continue or lift bans on selling ivory have been featured.

At the same time, it is important to note that standards of scientific proof change over time as scientists refine their knowledge or as they are influenced by new world views. In environmental areas, scientists are more likely to conclude that there is good evidence for links between pollutants and human disease today than in the 1960s to 1970s because scientists, like much of the rest of the population, have moved from “pre-environmentalist” views of humans as separate from nature and focus on an “average person” as the unit of study to an “environmentalist worldview” stressing human nature connections, more pathways by which chemical substances affect human health (the notion of hormone disrupters was not widely accepted until the early 1990s) and more willing to acknowledge that different categories of persons (children vs adults; persons living near toxic sites or in highly polluted areas versus persons living further away or in relatively unpolluted areas) experience different health effects.¹⁸ This shifting standard of proof, based on a shift in values but also supportable on scientific grounds, heightens controversies between supporters and opponents of particular regulatory measures if they also diverge in their deeper assumptions about how “good science” is done. Particularly in those areas, scientists and other experts increase the value of their contributions to debate when they specify both their criteria for coming to conclusions and the extent and limits of their knowledge about the phenomena under discussion because such transparency makes it easier to identify partisan exaggerations of scientific or technical conclusions.

III. Efforts to Control Use of Information

The distinction between “basic science” – general knowledge of physical phenomena developed by scientists motivated by broad curiosity about the world – from “applied science” – development of physical

¹⁴ Tora Skodvin and Steinar Andresen, “Nonstate influence in the International Whaling Commission,” *Global Environmental Politics* 3 (4): 74 (2003).

¹⁵ Kerry E. Rodgers, “Multiple meanings of Alar after the scare: Implications for closure,” *Science Technology and Human Values* 21 (2): 177-197 (1996).

¹⁶ Charlie Pye-Smith, “Truth games,” *New Scientist* 9 Jan. 1999, p. 1616.

¹⁷ See Marion Nestle, *Safe Food: Bacteria, Biotechnology, and Bioterrorism* (Berkeley: University of California Press, 2003).

¹⁸ Sylvia Tesh, *Uncertain Hazards: Environmental Activists and Scientific Proof* (Ithaca, NY: Cornell University Press 2000, Chapter 4.

objects for everyday use through application of experimental method and accumulated scientific knowledge to develop a particular structure or product is now so well established that it frames many discussions of technological development. It can be traced back to the development of two distinct systems of rewarding scientific and technological development in early modern Europe. In the 17th century scientists committed themselves to norms of open exhibition and publication, freely sharing their results with anyone who cared to pay attention. Though initially adopted at least in part to deflect accusations of engaging in magic or other “dark arts,” the norm of open publication soon became a central element in defining proper scientific conduct. Individual scientists who provided notable advances in knowledge were rewarded with fame, prizes, medals, membership in local or national scientific academies, and (as science moved into universities and institutes during the 19th century) steady teaching or research jobs. Inventors made no commitment to freely share information; they were concerned with specific practical problems and using their inventions to further their own enterprises. Inventors were quick to adopt elements of scientists’ experimental method, but until the 20th century their work depended much more on the results of trial and error than on direct transfer of scientific knowledge into practical devices. This strong separation between scientific knowledge and advances in technology meant that allowing inventors to assert intellectual property rights over their advances did not appear to pose any problem for the diffusion of basic science.

Patents, copyright, and other forms of intellectual property rights were developed to promote innovation and creativity by giving inventors and writers, musicians, and artists the right to control others’ use of their work for a defined period of time – typically 20 years for patents and up to 120 years for copyright.¹⁹ Neither patents nor copyright directly constrain the flow of information: inventors must disclose the method of making their invention and its mode of operation in considerable detail to get a patent while the typical writing, design, or artistic production covered by copyright is clearly visible to anyone who sees it.

However, patent and copyright holders can define the conditions under which others may use that information. If they are inclined to withhold permission for use, they can effectively limit further innovation or creativity that builds on their work. Inventors and business firms can be stymied in some fields by the need to get permission from multiple patent holders to pursue innovation in certain lines of production²⁰ or by what patent lawyers call “patent trolls” – patent holders who secure patents mainly to keep competitors from developing certain technologies or products any further by refusing to license their patented technology. Patent or copyright holders can also discourage others through demanding large payments for use of their patented technology or copyrighted material.

As long as “basic” and “applied” science appeared to operate in very different realms, open publication norms and intellectual property rights could coexist without coming into serious tension. In a few areas, however, the realms have converged in ways that raise difficult questions of defining what is “basic” (hence part of the common fund of knowledge open to all), and what is “applied” (hence belonging for a time to the originator and usable only with permission). This has been particularly true in genetics, where recombinant

¹⁹ The duration of patents remains largely unchanged. The first copyright laws specified a 14-year duration, which was still the norm in the early 20th century. Copyright duration was extended dramatically in the late 1970s. See David Nimmer, *Copyright: Sacred Text, Technology and the DMCA*. The Hague: Kluwer Law International 2003, p. 63.

²⁰ M.A. Heller and R.S. Eisenberg, “Can Patents Deter Innovation? The Anticommons in Biomedical Research,” *Science*, 280: 698-701 (1 May 1998).

DNA research quickly overlapped with a host of promising and potentially lucrative applications in curing of diseases and development of new varieties of plants.

The implications of patents for basic science in general and genetics in particular were broadened by two changes in US patent law that occurred in 1980. Congress reversed the longstanding rule that both results and direct applications of knowledge gained in publicly funded research automatically enter the public domain and may be used by all. The Bayh-Dole Act of 1980 allowed scientists or their institutes to patent applications of federally funded research and hold the patents as their own intellectual property.²¹ The implications for basic science were increased by the US Supreme Court ruling in *Diamond v. Chakrabarty*, that “anything under the sun made by man” is patentable.²² This led the US Patent & Trademark Office to reclassify biotechnology advances as “innovations” (applied science that can be patented) rather than “discoveries” (basic science), significantly reinforcing the scramble to be the first to uncover new genetic knowledge or develop a new technique for using it. This was not as large a leap into the unprecedented as it might look at first glance; the US government had defined a new category of “plant patents” covering plants reproduced asexually from cut stems or grafting (but not from tubers as the tubers are foods) in the Patent Act of 1930.²³ European countries extended patents to plants bred from seeds after establishing the International Union for the Protection of New Varieties of Plants (UPOV) in 1961.²⁴

A logically similar, though physically very different, situation developed in the very different field of computer software. Computer software has been treated as a written production covered by copyright, allowing developers to assert property rights in their work from the start. As office and personal computers became mass-market items in the 1980s, copyright opened up the prospect of making significant amounts of money by writing widely used programs. At the same time, computer users became dependent on software writers’ ability to write programs that would function with one another for two reasons. First, industry adoption of computer architectures in which an “operating system” (OS) provides the interface between the programs that run the machine and the programs that human users employ to indicate what tasks the machine should perform meant that all writers of the human-user programs (“applications”) had to write programs that could run on an operating system. Second, many people had ideas for complementary applications and “utilities” that would perform particular tasks more effectively than the original version of some application, and these could work only if they were compatible with the main application program.

Patent and copyright protections have been reinforced in recent years. In the USA the Reagan (1981-89), Bush senior (1989-1993), and Bush junior (2001-2009) administrations strongly supported the expansion of intellectual property rights both within the USA and globally through the Trade-Related Intellectual Property Rights Agreement (TRIPS) included in the set of international trade agreements administered through the

²¹ Public Law 96-517; *United States Code*, Title 35, Chapter 18 (sections 200-220) “patent rights in inventions made with federal assistance”.

²²*Diamond v. Chakrabarty*, 447 U.S. 303 (1980). The dispute involved a bacterium with genetic modifications enabling it (unlike any naturally occurring variety) to break down crude oil.

²³US Plant Patent Act of 1930, *United States Code*, Title 35, sections 161-164.

²⁴The 1961 International Convention for the Protection of New Varieties of Plants and later amendments are available at <http://www.upov.int/en/publications/conventions/index.html> (accessed 10 July 2009). A database of national plant patent laws is maintained at <http://www.upov.int/en/publications/npvlaws/index.html> (accessed 10 July 2009).

World Trade Organization. The copyright rules covering computer software have been interpreted to mean that software writers are not obligated to disclose all of their source code to hold copyright. This has enabled Microsoft to maintain advantages in the applications software market by refusing to share all the source code of the successive versions of its Windows operating system. Both TRIPS and the decisions to permit patents of genetically modified organisms remain controversial. Many advocacy groups regard them as amounting to a new “enclosure” allowing private individuals and firms to assert ownership over knowledge, medicines, and life forms that ought to be shared in common.

The threat to diffusion of information perceived to be posed by patents in genetics and copyright in computer software evoked strong response in both areas. The response to Microsoft’s market dominance combined anti-trust litigation against the company, which had limited success, and emergence of the “free software”/ “open source” movement among computer programmers who, following Richard Stallman’s lead, use copyright law to establish and maintain a norm of disclosing all code so anyone can use it. This is accomplished through the General Public License under which a software developer using any of the Unix-style operating systems or application software covered by a GPL as elements of a new software product must reveal all the code and issue a GPL for that new software product.²⁵ Concerns that patents might be used to shift the traditional line between “basic” and “applied” science by asserting ownership claims to the “expressed sequence tags” (ESTs) that permit more rapid analysis of gene sequences or even to the human genome sequence itself inspired editors of scientific journals to insist that new cell lines, hybridomas and DNA clones described in published papers be made available to other scientists²⁶ and others to organize projects for getting them into public databases before any patents were granted.²⁷ Critics of allowing sale of genetically modified plants, foods, or animals have also made reversing rules defining new life forms as patentable part of their campaign in the expectation that removing property rights would reduce corporate interest in developing GM organisms.²⁸

The debates about patents, copyright, and other intellectual property are very complex because participants give priority to different values. Inventors and innovators are particularly interested in the financial stakes, particularly in recapturing the costs of developing their inventions into marketable items. Scientists are concerned with maintaining their ability to generate basic scientific knowledge in fields where knowledge-generation depends increasingly on laboratory instruments and particular compounds or other physical objects. Governments increasingly seek to foster innovation but are also pressed by social movements and activist groups to give greater priority to ecological safety and social equity.

Most participants in contentions over intellectual property rights are not proposing to abolish patents and copyright altogether. Debate generally focuses on how long copyright protection should apply, what sorts

²⁵ Advocates present their arguments in Chris DiBona, Sam Ockman and Mark Stone, eds., *Open Sources: Voices from the Open Source Revolution* (Sebastapol, CA: O’Reilly, 1999); also see the Open Source Initiative website at www.opensource.org.

²⁶ Donald Kennedy, *Academic Duty*, Cambridge, MA: Harvard University Press, 1997, p. 206.

²⁷ Janet Hope, *Biobazaar* (Cambridge: Harvard University Press, 2008).

²⁸ E.g., the No Patents on Seeds appeal endorsed by farmers’ organizations in several countries at www.no-patents-on-seeds.org (accessed 30 June 2009); Mae-Wan Ho and Angela Ryan of the Open University, UK lead an effort to recruit scientists to support such a ban. See M.W. Ho, 2009, “Europe holds the key to a GM-free world” address to the 5th Conference of GM-Free Regions, Food, and Democracy published in *Science In Society* 43 (2): 21-24.

of writings and artistic productions should be covered by copyright, what sorts of innovations should be covered by patents, and when governments should use provisions for compulsory licensing of patented technology contained in virtually all national laws and in the TRIPS agreement.²⁹

Except in computer software, which is covered by copyright, debates about intellectual property rights inspired by advances in science or engineering focus on patents. Many critics of genetic modification technology want to remove patent protection from genetically modified plants and animals as a way of reducing the incentive to pursue genetic modification. They believe the prospect of significant financial gain encourages too much research into applications of genetic modification technology and also prompts corporations to ignore its health and environmental risks. Some critics of rising pharmaceutical costs and of the “medicalization” of life by use of drugs to address a wide range of behavioral patterns also propose removing or drastically restricting patent protection for new drugs, others prefer addressing situations in which there is broad need for access to newly developed drugs, as in the global AIDS epidemic, through compulsory licensing.

Study Questions

- 1.) Why do governments, corporations, and social groups sometimes want to control the spread of scientific and technical information? Are their reasons identical or different?
- 2.) How might those who want to get hold of that information do so?
- 3.) In what circumstances are their efforts likely to be successful? Unsuccessful?

<end>

²⁹ See the WTO's “FAQs on TRIPS and Health: compulsory licensing of pharmaceuticals” at http://www.wto.org/english/tratop_e/trips_e/public_health_faq_e.htm (accessed 10 July 2009).

IDEESE Module 1.3b Resources

Cultural Competence in a Transnational Workplace

MJ Peterson

Version 1; July 2009

I. General Considerations

Neither universalism – the belief that ethical rules and social practices are or should be the same in every human society – nor particularism – the belief that each separate society has its own entirely distinct ethical rules and social practices – accurately reflects social reality. Certain broad ethical ideals – including such precepts as people should be treated fairly, intentional killing of fellow humans should be avoided, the very young, the infirm, and the very old deserve care – are shared across cultures even if the particular definitions of “fairly,” “avoid,” and “deserve care” differ from place to place and era to era. Yet, other ethical questions – for instance, the acceptability of homosexual relations, the roles of women in society, or the acceptability of suicide – are answered in strikingly different ways around the world.

For much of human history, the differences in ethical rules and social practices were unimportant because particular individuals had little contact with societies other than their own. Such contacts have been increasing rather steadily since 1450, and in the contemporary era of globalization involve large numbers of people directly through travel or indirectly through greater availability of art, performances, videos, literature, and commentary on the Internet. Members of different societies interact more frequently; more ideas and images spread across political and cultural boundaries.

Scientists and engineers pursue their endeavors within the context of a particular society. For most, that society is the one in which they grew up; they are familiar with their society’s standards of conduct from life-long socialization into them through family, schools, and interaction with others in their immediate communities. For some, however, the society in which they pursue their career is different from the one in which they grew up, and their knowledge of society’s standards is likely to be weaker in consequence. Though scientists and engineers are participants in a transnational professional community, their immediate interactions with colleagues, clients, funding agencies, and others is shaped by the society in which their place of employment is located. The transnational character of science and engineering means that scientists or engineers can pursue their knowledge-building and knowledge-using activities anywhere. Common standards of evidence and reasoning, a common fund of accepted knowledge, and common

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standards for assessing the merits or shortcomings of fellow professionals' work prevail. At the same time, however, the specificity of their workplaces mean that other aspects of their work lives are affected by the ethics and practices of the society in which it is located. East Asians coming to study or work in Europe or North America soon learn that authors are expected to state their conclusion in the beginning of a scientific paper or engineering memo and write in their own words rather than quote authorities extensively and assume the reader will follow an argument to the conclusion stated at the end. North Americans going to study or work in East Asia soon learn that they need to show greater deference to senior scientists and engineers than they would usually be expected to show at home.¹

The notion that science and engineering rests on common transnational standards of reasoning, evidence, and judgment of work has been challenged in some intellectual circles. Both postmodern theorists and proponents of the "strong programme" in social studies of science maintain that what are called the "common standards" of science reflect a partial, Eurocentric approach to knowledge resting on dubious presumptions about knowledge that emerged during the Enlightenment. In their view the Enlightenment's belief that human reason could understand the universe clearly and accurately rests on two mistaken notions: 1.) that it is possible to understand phenomena by breaking them down into their particular parts and analyzing interactions among those parts, and 2.) that scientific or engineering activity can be "objective" in its selection of problems to study, definitions of reality, and assessments of hypotheses – guided solely by reason and well-insulated from the social power wielded by political, economic, and/or religious elites.² Postmodernists and "strong programme" proponents believe that phenomena can only be understood holistically and that social power pervades all aspects of science and engineering from the problems selected for study to the definitions of concepts, to the acquisition and interpretation of evidence, to the assessment of hypotheses. Yet, scientists themselves have been debating how far phenomena can be understood by breaking them into parts; ecology, biology and general systems theory all offer holistic conceptions of physical phenomena.³ Scientists and engineers have acknowledged the workings and possible influence social power without giving up on the possibility of developing reliable knowledge and applying it to understanding and working with physical objects in ways that are not completely subordinated to the interests or desires of those who currently wield social power.⁴

¹Such experiences are discussed in Sharon Traweek. 1988. *Beamtimes and Lifetimes: The World of High Energy Physicists*. Cambridge: Harvard University Press.

² The "strong programme" originated in David Bloor, *Knowledge and Social Imagery* (London: Routledge, 1966). Barry Barnes, David Bloor, and John Henry, *Scientific Knowledge: A Sociological Analysis* (London: Athlone, 1996) summarize the state of the strong programme through case studies. Jean-Francois Lyotard, *The Postmodern Condition: A Report on Knowledge* Geoff Bennington and Brian Massoumi, trans. Minneapolis: University of Minnesota Press, 1984 is a key statement of the postmodernist position.

³ E.g., J. E. Lovelock, *The Ages of Gaia: A Biography of our Living Earth* (NY Bantam Books, 1990); Lynn Margulis, *Symbiotic Planet: A New Look at Evolution* (1998); G. Klir, ed., *Trends in General Systems Theory*, pp. (New York: John Wiley and Sons, 1972).

⁴ These include Ian Hacking, *The Social Construction of What?* (Cambridge: Harvard University Press, 1999) Philip Kitcher. 2001. *Science, Truth, and Democracy*. New York, NY: Oxford University Press.

II. Cultural Differences

Considerable thought has been given to understanding the ways in which cultures differ from one another. Academic work on cultural differences ranges from anthropologists' detailed ethnographic studies of particular peoples or groups to anthropologists' and sociologists' studies of how cultural differences affect interactions among individuals and groups, to efforts to identify broad differences among cultures. These efforts have identified a number of dimensions on which cultures differ and elicit varying patterns of behavior among the individuals and groups living within a particular culture.⁵ These are often expressed as contrasting or varying orientations on broad dimensions, such as:

- 1.) high context/low context (participants in interaction and exchange assume there is a thick common framework of meanings and understandings so specify few details – participants assume there is need to specify details in contracts or other arrangements).
- 2.) polychronic/monochronic (people are willing to do more than one thing at once – people prefer focusing on one task or activity at a time).
- 3.) future/present/past orientation (optimism about future and ability to shape it – uncertainty about future and more focus on immediate term – strong consciousness of the past and desire to maintain tradition).
- 4.) unlimited time/limited time (regarding time as plentiful and always available – regarding time as limited and needing to be used well or lost).
- 5.) control/harmony/constraint (view physical and social context as something that can be controlled with right action – as something to fit one's plans into – as a constraint that excludes some activities).
- 6.) individualist/communal (self-definition in terms of one's own personal goals – self-definition in terms of the goals of a group which one belongs).
- 7.) vertical/horizontal or hierarchical/egalitarian (sharp stratification and high social distance between persons of different ranks – mild stratification and low social distance between persons of different ranks).
- 8.) doing/being (focus on observable accomplishments – focus on affiliations, character, qualities).
- 9.) assertive/nonassertive (obvious efforts to advance one's own or one's groups interests are acceptable – such efforts are undesirable).

⁵ Such as Clyde Kluckhohn and Fred L. Strodtbeck, *Variation in Value Orientations*. Evanston, IL: Row, Peterson, 1961; Talcott Parsons, "The Pattern Variables" in *On Institutions and Social Evolution: Selected Writings*. Leon H. Mayhem, ed., pp. 106-114. Chicago: University of Chicago Press, 1962; Stephen Rhinesmith, *Cultural Organizational Analysis: The Interrelationship of Value Orientations and Managerial Behavior*. Cambridge, MA: McBer and Company 1971; Edward C. Stewart and Milton J. Bennett, *American Cultural Patterns: A Cross-Cultural Perspective*, rev ed. Yarmouth, ME: Intercultural Press 1991; Charles Hampden-Turner and Alfons Trompenaars, *The Seven Cultures of Capitalism*. New York: Doubleday, 1993; Geert Hofstede and G. J. Hofstede. 2005. *Cultures and Organizations: Software of the Mind*. New York: McGraw-Hill.

- 10.) centralized/decentralized (concentrating leadership and decision-making in one person or a small group leadership – allowing local communities or subgroups within organizations leeway to make many of their own decisions).
- 11.) holistic/analytical or systemic/linear (think in terms of interrelated wholes – break things into parts linked in chains of cause and effect).

Detailed descriptions of cultures help people understand others' way of life and appreciate the variety of ways in which humans satisfy material, intellectual, and spiritual needs. Efforts to identify and summarize the effects of broad contrasts among cultures help people orient themselves intellectually to dealing with persons from other cultures. Knowing that one's own culture is high context, communal, and assumes unlimited time and that the one where one will be working is also communal but low context and assumes limited time promotes awareness of the points on which one's interactions with new collaborators are likely to be difficult. However, neither the detailed descriptions nor the efforts to outline broad contrasts provides enough guidance about coping with others of different mindsets and behavior in daily social and work life. Guidance on those matters is more prominent in applied psychological and social psychological studies, analyses of organizations, and those parts of the business and professional self-advancement literatures focused on cross-cultural negotiation or workplace relations.

III. The Tangle of Generalization

Generalizations about members of particular nationalities or of even more encompassing groups like Buddhists, Christians, Hindus, Jews or Moslems come in two forms. Cultural generalizations are built up from broad experience with many individuals and represent the results of inductive reasoning. Stereotypes are also built up inductively, but tend to be drawn from behavior that the outsider or outsiders regard as irritating or morally abhorrent and to get exaggerated in the process. Both cultural generalizations and stereotypes can be misleading because particular individuals do not always conform to them; stereotypes are more likely to reinforce rather than reduce barriers to understanding since they focus on perceived differences defined as particularly unpleasant.

The path of reasoning from cultural generalization to individual behavior is long because culture, broadly defined as a distinct set of values, norms, practices, and institutions defining life for members of the culture can exist at five levels:

- a.) the civilization, or level of broad affinities linking sets of countries,
- b.) the country, since each distinct political unit develops its own particular political culture, economic organization, and social mores within its civilization,
- c.) the organizational, pertaining to the firm, university, or other organization within which a person works, pursues community endeavors, or engages in leisure activities,
- d.) the group or team, whether at work, in the community, or in social relations, and

- e.) the interpersonal, as individuals of the same or different larger cultures interact with one another and develop expectations about their relationship with each other.

This multilayering indicates that individual mindsets and behavior are shaped by several levels of group membership interacting with the individual's own personal characteristics and inclinations.

Cultural generalizations and stereotypes are particularly misleading if the people using them fail to remember that no culture prescribes uniform responses to all occasions and interactions. Every culture has rules about how different sorts of persons (older/ younger, male/female, higher ranking/lower ranking, close friend/new acquaintance, professional/client, etc.) should interact. It also has different rules for conduct on different occasions (at work, at home, at a festival, in a friend's home, at a funeral, at a house of worship, etc.).

IV. Effective interaction in the Workplace

Knowledge of the civilizational and country culture of a place where one will work, or from which collaborators come, is only the start of successful cross-cultural interaction in a particular workplace. To that knowledge must be added attentiveness to the nature of the situations, the character of the particular individuals, and a willingness to observe others and adapt. The habits of mind needed for effective cross-cultural work can be organized under three headings: those forming general preparation for cross-cultural collaboration, those promoting effective interactions inside and outside the workplace, and those most relevant to workplace success.

General Preparation

- 1.) Willingness to continue learning about other cultures and communities, including knowledge of a country's or area's history, political, economic, and social conditions, and current debates. Individuals learn about and master appropriate behavior within their own culture over time; acquiring the knowledge needed for understanding another culture also takes time.
- 2.) Ability to manage the stress of operating in an unfamiliar setting, whether this is a workplace altered by new colleagues coming from elsewhere or an assignment to work abroad. Stress will be greater on assignment abroad since interaction outside work will be in the unfamiliar culture and inspire feelings of being out of place and having to cope with others' stereotypes about one's own country or culture.
- 3.) Cultivation of language skills. Individuals vary considerably in their ability to learn a second or third language, but those on assignment in another country will find ability to read signs and make simple requests in the local language helpful. At the other end of the scale, some studies suggest that people expect outsiders who are fluent in their language to conform more closely to local cultural norms than outsiders who are not fluent.

Workplace and Social Interactions

- 1.) Ability to use knowledge of the country or area to guide observation and interaction.

- 2.) Sensitivity to one's own and others' verbal and nonverbal communication, all the choices of words, tones of voice, gestures, and less conscious "body language" that provides clues about another person's mood and intentions.
- 3.) Ongoing observation and reflection on others interacting with members of their own culture or persons of other cultures to refine one's own understanding of what sorts of conduct elicit favorable and unfavorable reactions or when situations are becoming dangerous.
- 4.) Willingness to change one's own behavior when acting as one would at home or among members of one's own culture would cause offense and to follow local customs even when they seem awkward.
- 5.) Attentiveness to following the social etiquette appropriate to the situation (when in another country) or to helping visitors follow the proper etiquette (when hosting foreigners).⁶
- 6.) Willingness to understand how persons of other cultures assess who is or is not trustworthy and behaving in ways that establish credibility with them when needed.⁷

Workplace Success

- 1.) Developing ability to negotiate successfully with persons of other cultures, whether to conclude particular bargains or to develop collaborative relations by understanding which methods are or are not acceptable in other participants' cultures.⁸
- 2.) Enhancing ability to influence colleagues from other cultures by understanding how to get them to participate in discussions and accept suggestions.⁹
- 3.) Developing ability to manage, defuse, or resolve workplace conflicts between self and persons of other cultures by understanding what words and actions increase or dampen conflict or mistrust.¹⁰

⁶W. Arthur, Jr. and W. Bennett, Jr. 1995. "The international assignee: The relative importance of factors perceived to contribute to success," *Personnel Psychology* 48: 99-114.

⁷J. Sullivan, R.B. Peterson, N. Kameda and J. Shumada 1981. "The relationship between conflict resolution approaches and trust, -- a cross-cultural study," *The Academy of Management Journal* 24: 803-815; P.M. Doney, J.P. Cannon, and M.R. Mullen 1998. "Understanding the influence of national culture on the development of trust," *The Academy of Management Review*. 23: 601-620.

⁸J.M. Brett, and S. Okumura. 1998. "Inter- and intra-cultural negotiation: U.S. and Japanese negotiators" *Academy of Management Journal* 41: 495-510; V.C. Sheer, and L. Chan 2003. "Successful Sino-Western business negotiations: Participants' accounts of national and professional cultures." *Journal of Business Communication* 40: 50-85; M.J. Gelfand, M. Erez, and Z. Aycan. 2007. "Cross-cultural organizational behavior," *Annual Review of Psychology* 58: 479-514.

⁹M.J. Gelfand, M. Erez, and Z. Aycan. 2007. "Cross-cultural organizational behavior," *Annual Review of Psychology* 58: 479-514; J.S. Black and L.W. Porter 1991. "Managerial behavior and job performance: A successful manager in Los Angeles may not succeed in Hong Kong" *Journal of International Business Studies* 22: 99-113;

¹⁰T.R. Tyler, E.A. Lind, and Y.J. Huo 2000. "Cultural values and authority relations: The psychology of conflict resolution across cultures," *Psychology, Public Policy, and Law* 6: 1138-1163; J. Sullivan, R.B. Peterson, N. Kameda and J. Shumada 1981. "The

- 4.) Enhancing ability to establishing authority vis-à-vis colleagues or clients of different cultural backgrounds by understanding how to establish leadership or control over actions among persons of other cultures.¹¹

Study Questions

- 1.) What are the similarities of and differences between cultural generalizations and stereotypes?
- 2.) What are the dimensions on which cultures differ? Can you name countries where the culture favors a particular orientation on each dimension?

<end>

relationship between conflict resolution approaches and trust, -- a cross-cultural study," *The Academy of Management Journal* 24: 803-815; K. Ohbuchi, K. and Y. Takahashi 1994. "Cultural styles of conflict management in Japanese and Americans: Passivity, covertness, and effectiveness of strategies." *Journal of Applied Social Psychology* 24: 1345-1366; M.W. Morris, K.Y. Williams, K. Leung, R. Larrick, M.T. Mendoza, D. Bhatnagar, J. Li, M. Kondo, J. Luo, and J. Hu 1998. "Conflict management style: Accounting for cross-national differences," *Journal of International Business Studies* 29: 729-747.

¹¹T.R. Tyler, E.A. Lind, and Y.J. Huo 2000. "Cultural values and authority relations: The psychology of conflict resolution across cultures," *Psychology, Public Policy, and Law* 6: 1138-1163.

IDEESE Module 1.3b Resources

Transnational Differences in Ethical and Regulatory Standards

MJ Peterson
Version 1; July 2009

I. Introduction

Engineers have been subject to explicit government regulation of their activities because they design and guide construction of physical structures used by other people and located in places where their decay or collapse could pose dangers to non-users as well. As long as the effects of laboratory accidents remained confined within the lab itself, there was less concern about scientists' daily activities. This changed in the 20th century as concerns about disposal of toxic substances, concerns about the possibility of germs spreading out from laboratories, or fears that genetically modified plants allowed in open fields would contaminate other areas increased. Today both engineers and scientists find their activities governed by a range of regulations meant to protect the public from various hazards. Scientists and engineers working in transnational collaborations, or in countries other than their own, need to be aware of the ways in which regulatory responses can differ. Some of these differences stem from variations in the perceived acceptability of an activity in different cultures. Others stem from different approaches to the common problem of identifying and regulating hazardous activity. Yet, others stem from differences in reaction to scientific or technological breakthroughs.

II. Differences in Social Mores inspiring Regulatory Standards

Different societies may define the same activity in starkly contrasting ways, one regarding it as acceptable, another as dubious, and yet another as morally abhorrent. In 1997, an unidentified technician at the French satellite TV broadcaster France Telecom got his company into considerable trouble by inadvertently shifting a sexually explicit movie intended for audiences in French Pacific Island territories onto a channel sending the signals to Saudi Arabia and the Gulf where the broadcast caused outrage.¹ Homosexual

¹ A Saturday night surprise for the Saudis" *The Economist* 26 July 1997 p. 39

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relationships are another area of strong contrast, treated as acceptable in some societies, as dubious in others, and as so morally abhorrent that they are a crime punishable by death in others.²

Most moral differences have little effect on the conduct of science or engineering, but some can have major implications if a particular moral precept is regarded as directly relevant to organizing scientists and engineering activity. Many Christians and social conservatives in the USA object to scientific research using human stem cells derived from embryos because the stem cells cannot be secured without destroying the embryo. A strict interpretation of their belief that human life begins at the moment when sperm penetrates egg logically entails the conclusion that intentionally destroying embryos is equivalent to murder. The George W. Bush administration, which had considerable political support from conservatives sought to finesse the conflict developing between that bloc and Republican moderates who supported stem cell research by restricting federal research funding to work on embryonic stem cell lines already developed before 9 August 2001. The rule meant that unless they could get funding elsewhere, US researchers had far more limited choices of material than their colleagues in other countries. The limits were even more restrictive than Bush thought because of the “more than 60” stem cell lines he thought were ready for use, only 22 had been fully developed and leading scientists regarded many of those 22 as having limited usefulness.³

III. Variations in Regulating Hazardous Activity

Different societies may agree that the same activity is hazardous to other humans or to the environment, but regulate it in divergent ways. Regulations can range from prohibiting the activity entirely, allowing it only in particular circumstances, requiring those who engage in the activity to take special measures to reduce hazards, or discouraging the activity through provisions of liability law.

Completely banning an activity is most likely when its hazards are perceived as severe and its benefits as marginal. Pressed by vocal citizen groups and environmentalist movements, the governments of major industrial countries have banned a significant number of human-created chemicals because their toxic effects are seen as greatly outweighing any benefit of using them. However, bans on using particular chemicals apply only within the territory of the country or countries adopting the ban. As long as use of the chemical is legal elsewhere, chemical makers could manufacture the banned chemical for export. Chemical companies supplying foreign markets usually succeed in staving off efforts to ban manufacture as well as use by arguing that banning manufacture will favor foreign companies not subject to a ban on manufacturing, thereby reducing local income and/or jobs.

That a chemical banned in some countries is not banned in all may reflect political or physical conditions. Many governments lack the scientific and administrative resources to test chemicals for toxic effects, but can compensate for that by observing regulatory trends elsewhere and banning any chemical after one or more industrial states with extensive testing capacity has adopted a ban. The problem of keeping track of bans has been simplified as developing country governments unhappy about what they perceived as the

²According to an activist organization, the International Gay and Lesbian Human Rights Commission, at least 80 countries define same-sex sexual relations as crimes. See “IGLHRC Commentary: End the criminal treatment of GLBT people” at <http://www.iglhrc.org/cgi-bin/iowa/article/pressroom/iglhrccommentaries/929.html> (accessed 1 July 2009).

³ Chris Mooney, *The Republican War on Science* (2005), pp. 2-4 and 185-204.

dumping of now-banned chemicals on their countries' markets sought to use their majorities in UN Bodies to secure international agreements that would allow them control of cross-border sales of toxic chemicals. The first result was the UNEP International Register for Potentially Toxic Chemicals, which included information about chemical hazards and listings of chemicals that had been banned or subjected to use restrictions. This was later linked to voluntary (1987-) and Mandatory (1991-) systems of securing prior government permission for imports of chemicals on the Register. The Register became more useful over time, first as an FAO/UNEP Joint Group of Experts was established to provide technical guidance for compiling of lists of banned or restricted chemicals and coordinated the process of developing the Decision Guidance Documents that indicate the types and severity of hazards posed by chemicals included on the list of those requiring import permits.⁴

Differences based on varying perceptions of particular chemicals' usefulness remain. The ability to kill a wide range of pests that made the chemical dichlorodiphenyltrichloroethane (DDT) attractive in the 1940s became perceived as a serious problem in the early 1960s, and it was banned in most industrial countries by 1980. Developing states were slower to ban DDT, not merely because environmental movement influence was lower but also because of the chemical's perceived usefulness against malaria-carrying mosquitoes and in agriculture.⁵

Sometimes debates about the hazards of an activity lead to regulations limiting the activity rather than a complete ban. This may occur because the activity or product remains the best available choice for particular uses. Bans on adding tetraethyl lead to enhance combustion of gasoline (petrol) used in land transport were adopted in North America in the 1970s, most parts of Europe in the 1990s, and in China in 2001 because substitutes were available, however a newer "low lead" formulation remains the primacy additive in 100 octane aviation fuel because a cost-effective substitute has not been found. Other ban proposals fail because of objections on other grounds. Until the hazards of exposure to tobacco smoke from other people's cigarettes and cigars were firmly demonstrated, efforts to ban smoking foundered on objections that they would interfere too much with individuals' lifestyle choices. Even with better understanding of hazards, bans cover only enclosed public spaces.

Societies can react to perceptions of hazard by subjecting an activity to special regulations and/or requiring that those engaged in it have particular training. Training standards may be reinforced by a system of government licensing for individuals seeking to carry on an activity. Engineering is a licensed profession in most countries of the world; not only must aspiring engineers be trained in schools of engineering accredited by national engineering societies; they must pass government-administered tests and meet other experience requirements. An engineer whose work or inattention is identified as contributing to a major structural or process failure is likely to lose the license. Scientists are not directly licensed, but the scientific community insists that newcomers have training in accredited academic programs; laboratories are also covered by any general or specific requirements regarding abatement of hazards to persons and the environment in force where the lab is located. Social sensitivities about lab hazards have grown since

⁴ See David Victor, "Learning by doing' in the nonbinding international regime to manage trade in hazardous chemicals and pesticides," in David G. Victor, Kal Raustiala, and Eugene B. Skolnikoff, eds. *The Implementation and Effectiveness of International Environmental Commitments*, 221-281. Cambridge: MIT Press, 1998.

⁵C.F. Curtis, "Should DDT continue to be recommended for malaria vector control?" *Medical and Veterinary Entomology*, Vol. 8 (2) : 107-112 (1994).

the mid 20th century, and scientists are now more aware of need to take public views into account. Awareness of public unease and concern that governments might regulate the work out of existence induced the world's leading genetic scientists to observe a moratorium on genetic modification research while they examined the hazards of such work and developed global standards for reducing those hazards as much as possible in 1974-1975.⁶

Liability law can be used to discourage particular activity in several ways. Imposing a standard of "strict" (sometimes called "absolute") liability requiring those who engage in a particular activity responsible to repairing or provide monetary compensation for any and all damage it causes to others or their property. Imposing this standard automatically increases the cost of insurance because it exposes the doer to more claims than the more usual conditional liability standard that requires repair of or monetary compensation of harm only when a) the activity violates another person's rights, b) the harm is inflicted intentionally, or c) the harm arises from negligence in conduct of the activity.⁷

IV. Variations in Reaction to Scientific or Technological Breakthroughs

Differences in social presumptions regarding new activities can also produce different reactions to the same scientific or technological breakthrough. A significant portion of the US-EU argument about sale of plants bred with genetic modification techniques and foods containing ingredients from such plants stems from differences in the assumptions used to guide policy formulation in each area. In the EU, plants created through genetic modification are regarded as significantly different than those developed by grafting, hybridization, and other previously-developed techniques for selective breeding; they may not be grown in fields or used as human or animal food unless such use has been specifically approved. Thus, the EU's basic policy guideline is "prohibited unless specifically permitted." In the USA, plants created through genetic modification techniques are regarded as "essentially similar" to those developed by older methods of selective breeding and may be grown and used in food unless proven to be hazardous. Thus, the USA's basic policy guideline is "permitted unless specifically prohibited." If national food markets were completely distinct, with EU countries meeting all their food needs from within the EU, and the USA meeting all its food needs from within the USA, the difference in regulatory standards would pose no particular problems. US farmers would follow US standards, European farmers would follow EU standards, and each would only sell at home. However, national food markets are linked. The difference in regulatory assumptions means that many US products are unacceptable in the EU while all EU products are acceptable in the USA. European farmers can export more to the USA than US farmers can export to EU countries, and this difference in trade opportunities has been the source of serious contention between the EU and the USA.

Significant differences in major countries' regulations require persons or firms in third countries who want to export goods covered by the divergent regulations to decide which set of regulations to meet. Farmers or food processors in third countries who want to export to Western industrial countries might decide to cater to one market and not the other, opting to follow either EU or USA standards. If they want to export to both markets, the logically simplest choice is to meet the more restrictive standards since anything meeting more restrictive standards will automatically meet less restrictive ones. Following this logic, they would

⁶Paul Berg and Maxine F. Singer. "The recombinant DNA controversy: Twenty years later," *Proceedings of the National Academy of Science* 92: 9011-9013 (Sept. 1995)

⁷ Basic concepts are summarized in Edward J. Kionka, *Torts in a Nutshell* (Minneapolis, MN: Thompson/West, 2005).

grow only those genetically modified plants approved for sale in the EU. Whether third country suppliers follow this logic depends on two factors: a) the extra cost (if any) involved in meeting the stricter regulations and b) whether opportunities to export to the country or countries with the most restrictive regulation are great enough to make altering production to meet the more restrictive standards worthwhile.

Decisions about which importing country regulations to satisfy pervade major industries. For years environmentalists argued that division of the world into more than 200 states each making their own regulations would always trigger a “race to the bottom” in which companies would locate their production in the countries with the least regulation on ingredients put into products and of pollution created while making them, and those regulations would set the global tone because governments of other countries would fear losing industries to the weak regulation countries. More recently, analysts of government regulation have noted that it is possible to set up a “race to the top” regarding ingredients and product performance if the governments having the strictest regulations rule countries whose domestic markets account for a large share of world sales.⁸ Large domestic markets mean that product performance standards set by the USA and the EU have been particularly influential; standards set in Japan, China, India, and Brazil are also becoming more important as people in those countries become wealthier and can buy a wider range of products.

Study Questions

1. What are the sources of differences in standards?
2. What are the different ways societies can deal with activity regarded as hazardous? Can you give an example of each of the different responses?
3. Companies, organizations, and individuals operating in more than one country can deal with differences in standards by choosing to carry out activity where regulations are least demanding, adapting activity to the rules in each location where it occurs, or following the demanding regulations everywhere. Can you give an example of a company's or organization's choice when faced with different regulations?

<end>

⁸ Within the USA, where state governments have authority to set product performance standards in many areas, this pressure for satisfying tight regulations is known as “the California effect.” Consumers in that state form about 20% of the US domestic market, and California has adopted particularly strict regulations in a number of areas. See David Vogel, *Trading Up: Consumer and Environmental Regulation in a Global Economy*, Cambridge, MA: Harvard University Press, 1995.

IDEESE Module 1.3b Resources

Hints on Cross Cultural Skills

MJ Peterson
Version 1; July 2009

This document outlines suggestions about dealing with cultural differences among collaborators drawn from the business literature.

Different authors present different schemes, but there is broad consensus on three elements of effective cross-cultural interaction.

1. Self-awareness

Self-awareness requires developing conscious identification of one's own orientations towards the various aspects of interaction with others. Different authors suggest different "self-tests" that a person can use to develop this conscious awareness by asking themselves various questions about how they like or dislike various forms of interaction. The self-test developed by Training Management Corporation¹ asks questions designed to elicit an individual's orientations along the following dimensions of interaction:

Social and Physical Environment:

- control (a person makes her/his own way)
- harmony (a person does best by maintaining a balanced relation between self and social and physical environment)
- constraint (a person must live within fairly tight limits imposed by social and physical surroundings and has little scope to challenge or change them)

Time:

- single-focus (person prefers doing one task at a time and following schedules)
- multifocus (person will do many things at once and hold to vague schedules)

¹ Training Management Corporation "Cultural Orientations Indicator" described in Danielle Medina-Walker, Thomas Walker, and Joerg Schmitz, *Doing Business Internationally: The Guide to Cross-Cultural Success*, 2nd edition. New York: McGraw-Hill.

This 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>.

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- fixed (time consists of discrete units that need to be managed and used well)
- fluid (time is available and schedules can be adjusted to the needs of the situation or task)
- past (the past is the best guide for behavior, novelties should be examined carefully before adopted)
- present (focused most on current and near-term future; open to trying new things)
- future (emphasize the long-term; evaluate proposals in terms of long-term effect)

Action:

- being (concerned to build relations of trust before getting into an activity; prefer working with others who have already established credibility and reliability)
- doing (focused on getting a particular task or job done and willing to extend trust to those showing interest in collaborating until they demonstrate they are not trustworthy; tasks often mean short-term interactions)

Communication:

- high context (value symbolism and propriety; extract meaning from nonverbal and situational cues as much or more than on spoken and written cues)
- low context (rely on explicit statements and written commitments to record understandings)
- direct: (conflict situations can be positive when resolved, and most can be through open and honest statements of views)
- indirect: (conflict is best handled by avoiding direct confrontation, thereby preserving everyone's dignity and avoiding embarrassment)
- expressive: (emotional elements are expected and important parts of communication; high value on symbolism and stylistic sophistication)
- instrumental: (communication is unemotional, problem-centered, and goal-oriented; symbolism and style are not useful if they get in the way of achieving goals)
- formal (following proper social conventions and customs is important in all interactions; lack of formality is unprofessional)
- informal: prefers relaxed, egalitarian interactions with others and low social distance with in the workgroup; impatient with ceremonial)

Space:

- private (emphasizes maintaining spatial and psychological distance between people, separating work from private life)
- public (emphasizes close human interaction, face-to-face contact; work and social relationships tend to merge)

Power:

- equality (all persons have the same central value rights and responsibilities; economic and social differences should be downplayed so that everyone is included and has the same opportunities; procedures can be short-circuited to attain goals)

- hierarchy (stratified societies and organizations function best; different people have different rights and responsibilities and it is important to acknowledge people's place through proper etiquette and following established procedures)

Society:

- individualist (persons define themselves and are motivated primarily by their own personal interests and goals, value autonomy, and expect reward on the basis of their own accomplishments)
- collectivist (persons define themselves and are motivated primarily by the expectations of the group to which they belong, value interdependence within the group, and expect to be rewarded as part of the group)
- universalistic (judgments and actions should be guided by general rules of fairness and of right and wrong that apply to all)
- particularistic (judgments and actions should be guided by consideration of the unique needs of the individuals or groups involved; rules are guidelines to be modified as needed in specific situations)
- competitive (individuals compete with one another for recognition and reward; personal ambition and assertiveness are acceptable)
- cooperative (individuals support one another, maintain long-term relationships with collaborators, share in group rewards, and avoid self-assertion)

Structure:

- order (prefer a clearly defined parameters and guidelines for actions and work activities, precise definitions of what is expected, and preference for stable environments)
- flexibility (willing to adjust actions as conditions change, open into innovation, see change as an opportunity)

Thinking:

- inductive (derive patterns and generalizations from multiple examples and apply them in a pragmatic way, detail oriented, expects careful analysis of data)
- deductive (thinking moves from the general to the specific emphasizing the soundness of concepts on which proposals are based; more concerned with underlying principles than with pragmatic application of ideas to particular situations)
- linear (approach problems analytically looking for discreet components and the cause and effect relationships between them; convert problems or issues into a chain of elements each of which can be handled individually in a logical sequence)
- systemic (approach problems from a broad perspective focusing on the relationships among the elements of the situation; treat problems or issues as complex of interrelated things that cannot be decomposed into chains of events)

2. Preparation

Getting ready for anticipated interaction with colleagues of other cultures by determining their cultural backgrounds and orientations, identifying potential culture gaps between your own and their orientations,

and considering strategies for minimizing negative effects of those cultural gaps. The information needed for these activities can be drawn from media originating in the other culture, individuals with experience in a particular cultural environment, and direct information gathering with those with whom you will work.

3. Engagement

Drawing on the repertoire of alternate behaviors developed during preparation to reduce problems stemming from cultural gaps. This is easier in some areas than others. Many individuals find it easier to shift between information-focused and relationship-focused styles of communication than to move from an individual to a collective orientation regarding goals and achievements. Successful engagement over the medium to long term requires remaining open to more information and attentive to changing dynamics as different individuals enter or leave the collaborating group.

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IDEESE Module 1.3b Resources

Recommended Readings

MJ Peterson
Version 1; July 2009

Cultural Differences

- M.J. Gelfand, M. Erez, and Z. Aycan. 2007. "Cross-cultural organizational behavior," *Annual Review of Psychology* 58: 479-514. *A good summary of the state of the academic literature in 2007.*
- Steven J. Heine and Emma E. Buchtel, "Personality: The Universal and the Culturally Specific," *Annual Review of Psychology* 60: 369-394 (2009). *A summary of the debates on how far cultural traditions shape individuals' mindsets and behavior.*
- G. Hofstede and G. J. Hofstede 2005. *Cultures and Organizations: Software of the Mind*. New York: McGraw-Hill.
This is the most recent version of the book many writers on cross-cultural differences in business regard as the best general introduction.

Workplace Interactions

- Charles Hampden-Turner and Fons Trompenaars. 2000. *Building Cross Cultural Competence: How to Create Wealth from Conflicting Values*. New Haven and London: Yale University Press. *A widely-read discussion of managing and functioning in teams of persons drawn from different cultures.*
- David C. Thomas and Kerr Inkson, *Cultural Intelligence: People Skills for Global Business*. San Francisco: Berrett-Kohler Publishers 2004
- Duane Elmer, *Cross Cultural Connections: Stepping Out and Fitting In around the World*. Downers Grove, IL: InterVarsity Pteess, 2002. *An interesting counterpart to the business literature because it is written for individuals preparing for religious missionary work in other countries.*

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Webpages

These are some of the better online materials about cultural differences for general readers. (Active as of January 2011)

eduPASS (an organization promoting foreign student study in the USA)

Tips on US culture for visiting foreigners.

<http://www.edupass.org/culture/>

AnalyticTech

A business consultant's site with some free and some subscription-only content

www.analytictech.com/mb021/cultural.htm

University of the Pacific

An online guide primarily for US undergraduates getting ready to study abroad that includes examples of cultural misunderstandings and self-quizzes.

<http://www.pacific.edu/sis/culture/>

United States Peace Corps

Discussions of cultural differences for students ranging from 8th grade through college seniors

<http://www.peacecorps.gov/www/educators/enrichment/culturematters/index.html>

Beyond Intractability

Materials from a nongovernmental organization promoting peace and conflict resolution

http://www.beyondintractability.org/essay/culture_conflict/

Professor Gregorio Billikopf, University of California-Davis

Short comment that individuals' behavior does not always match cultural generalizations with examples from his own experiences.

<http://www.cnr.berkeley.edu/ucce50/ag-labor/7article/article01.htm>

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