

Integrating Ecological Issues into Psychology: A Senior Seminar in Environment, Health, and Behavior

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Abstract

Psychology as a discipline has been slow to integrate environmental health-related scientific findings into its subfields that comprise the study of a large number of problems and variables. Consequently the discipline has a limited understanding of individual, social, community, or global issues and problems and has not contributed to our understanding of environmental problems to the extent that it could. This article addresses ways of integrating science from other disciplines and from new fields of psychology including ecopsychology and neurobehavioral toxicology and describes in detail a senior-level seminar that incorporates in-depth study of environmental issues into psychology.

There is a great need to integrate global and ecological issues into the subfields of psychology, a discipline that has been conceptualized as having grown out of a Western industrial paradigm (Kidner, 1994). Psychology's acceptance of global industrialism and the dominant social paradigm (Milbrath, 1995), its emphasis on individual lifestyle choices as causal in ill health, and its failure to address environmental crises have resulted in lacunae in the field's ability to conceptualize a number of important problems. For example, environmental destruction and contamination have placed people in contact with a large number of toxins that have ill-health effects relevant to the subfields of developmental, health, social, abnormal, biological, and animal (comparative) psychology. But despite encouragement for psychologists to become involved in issues of environmental health (Bryce-Smith, 1986; Weiss, 1983),

rarely, if ever, are these problems included in present pedagogy. In health psychology, individual lifestyle choices such as smoking and fat intake are emphasized, but exposure to carcinogens, hormone-disrupting chemicals, and other toxicants may be neglected. Environmental racism, a process that differentially exposes minority people to toxicants, is relevant in health and social psychology but is rarely studied. Psychology has generally decontextualized the individual when attempting to understand human functioning, and thus has been limited in its ability for holistic understanding of both humans and animals. The Western industrial paradigm has not been questioned; consequently psychology has not addressed the effects of this paradigm on either Western or indigenous people. Thus even the study of diversity issues in psychology has focused on individual variables to the exclusion of the global treatment of more natural cultures at the hand of industrialized countries and corporations in the process of globalization. In short, major environmental crises now threaten the globe, while psychology continues to study isolated phenomena in the Baconian tradition.

Criticisms of Western psychology have come from environmentalists (Clark, 1995), sociologists (Milbrath, 1995), and European and Indian feminists (Mies & Shiva, 1993). A worldview so discrepant with that of more natural cultures (which comprise much of the world) threatens to render psychology irrelevant in regard to understanding people's problems in a global culture. Although new subfields, such as ecopsychology, ecotherapy (Clinebell, 1996), and ecofeminism have emerged as critique of present psychological paradigms, they have generally failed to substantially impact mainstream psychology. Even scientific work in the Baconian tradition relevant to environmental health has generally not been sufficiently incorporated. Consequently large bodies of works in environmental health, occupational health psychology, and neurobehavioral toxicology are not recognized or included in our conceptualizations of our topics of study.

Psychology could address ecological issues in two broad ways: (1) integrating global ecology by infusing relevant information into the subfields or (2) offering special courses to remediate the lack of coverage of these problems to date. This paper addresses both the infusion of relevant content into existing courses and the creation of a separate course as remediation strategies. I first briefly discuss the types of relevant data and studies that have been left out of existing courses and discuss the types of resources that are relevant to several areas of psychology. Of course many of these findings overlap and are relevant to more than one subdiscipline. Next I present an integrated class offering that addresses ecological issues for psychology students. This course, entitled “Environment, Health, and Behavior,” introduces ecological and toxicological issues, explores their effects and relevance for psychology, shows students alternative paradigms for worldviews, and then introduces the new subfields of ecopsychology, ecotherapy, and ecofeminism. More resources for Strategy 1 and a complete syllabus for Strategy 2 can be obtained from the author.

Strategy 1: Infusing Ecological Information into Existing Courses

Developmental psychology

Psychology’s understanding of a large number of childhood problems including autism, mental retardation, learning disabilities, child behavior disorders, the timing of pubertal development, birth defects, and childhood cancer is incomplete. There are scientific studies that address and contribute to the understanding of all these. For example, new studies show prenatal exposure to organophosphate pesticides to be associated with cognitive deficits at ages 12 and 24 months (Engel et al., 2011) and at 7 years (Bouchard et al., 2011; Rauh et al., 2011). In addition, psychologists cannot explain why girls are entering puberty at earlier and earlier ages. Yet science has amassed a body of work that addresses endocrine-disrupting chemicals and their contribution to girls’ early development (Steingraber, 2007). And it has now been shown that even BPA-free plastics emit these estrogenic chemicals (Yang et al., 2011). A new study has associated autism with proximity of maternal residence to a freeway in the third trimester (Volk et al., 2011). In addition, other toxics have serious effects on children’s health and need inclusion. Lead, only one of a number of toxic metals to which children are exposed, is associated with CNS damage, mental retardation, attention deficit disorders, learning disabilities, and emotional disturbances (Bellinger & Adams, 2001). Metabolites of organophosphate insecticides relate to child attentional abilities at ages 3.5 and 5 (Marks et al., 2010), and organochlorine insecticides may negatively affect neurodevelop-

ment through limiting the uptake ratio of triiodothyronine (Julvez et al., 2011).

Abnormal psychology

The study of abnormal psychology generally debates the nature/nurture issue but often ignores the contribution of environmental toxicants to the development of mental health problems. Yet Lundberg (1996) summarized the literature on air pollution and mental health and found a positive association between air pollution levels and psychiatric emergencies, police calls, aggression, and feelings of hopelessness. And there is growing evidence that solvents cause anxiety disorders (Dager et al., 1987; Morrow et al., 2000), sleep problems (Lindelof et al., 1992), and neurological damage (Doctor, 2002; Trimble & Krishnamoorthy, 2000); that exposure to pesticides and herbicides (even the “organic” rotenone) is associated with the development of Parkinson’s disease (Tanner et al., 2011); and that toxics may encourage child behavior problems both of the externalizing (Needleman et al., 1996) and internalizing (Perera et al., 2011) type.

Biopsychology/Neuropsychology/Assessment

Brain and nervous system functioning are impacted by toxics in serious and multiple ways. In some cases, (e.g., organophosphate pesticides), toxics are designed purposefully to damage neurotransmitters and enzymes in bugs that are also present in humans. Some of these pesticides, as well as other toxics, are also estrogenic and thus hormone disruptors. Prenatal atrazine exposure is associated with low birth weight and small head circumference in human neonates (Chevrier et al., 2011). Organic solvents may cause nervous system damage that persists long term and in some cases is permanent (see work of Morrow and colleagues). Researchers have identified anxiety and depression, memory impairment, irritability, fatigue, loss of ability to smell, postural difficulties (Moses et al., 1993), intellectual deterioration (Bang, 1984), EEG irregularities (Morrow et al., 1992), and disruption in both auditory (Varney et al., 1998) and visual attention (Morrow, 1994) as sequelae of solvent exposure. Brominated flame retardants appear to damage the developing nervous system via negative effects on thyroid function (Dingemans et al., 2011). In adults, long-term solvent exposure damages brain circuitry related to memory and attention (Tang et al., 2011).

Social/Community psychology

Social and community psychology courses can address the issues of environmental racism (Bullard, 1994), contaminated communities (Edelstein, 2004) and their sequelae, and the various pathways for

toxics in different communities (e.g., farming communities are at risk for pesticide poisoning). Environmental racism affects people of color in that their communities are actually targeted for high polluting industries and dump sites with resulting health, economic, and community consequences. The consequences of environmental contamination for community residents include physiological, psychological, social, and economic impacts and comprise relevant topics for social and community psychology (Bullard et al., 2007).

Health psychology

Although health psychology studies the interaction between mental health and the body, it generally studies it in the psychosomatic direction to the neglect of the somatopsychic. Integrating chemical stressors into the field of health psychology will better allow us to study cancer and other diseases. Though some animal studies suggest that chronic stress exposure may make organisms more vulnerable to pollution (Cooney, 2011), some studies show psychological stress *not* to exacerbate symptoms from chemical exposure (Laumbach et al., 2011). In addition the field of health psychology currently studies behaviors that are under personal control (e.g., smoking, drinking, fat intake) to the neglect of variables over which people have no control, such as exposure to pesticides and other carcinogens, consumption of hormone-disrupting chemicals, and proximity to polluting industries. In addition, both health and abnormal psychology conceptualize cardiovascular disease as being mediated by stress (Nevid et al., 2008). Yet direct toxic effects on the cardiovascular system are ignored. For example, exposure to particulate matter is associated with both increased blood pressure (Baumgartner et al., 2011) and premature ventricular contractions (He et al., 2011) in healthy adults. Health psychology can also integrate the study of “emerging” but currently delegitimized illnesses such as fibromyalgia, chronic fatigue, multiple chemical sensitivities, and Gulf War syndrome.

Psychology of women

Feminist psychology has contributed tremendously to the understanding of the impact of violence, sex discrimination, economic exploitation, and other stressors on the lives of women. But the relationship between women’s quality of life/health and environmental contamination remains almost completely unexplored. The psychology of women could explore women’s differential vulnerability to toxics. For example, women have less of the enzyme alcohol dehydrogenase (Freeza et al., 1990), which metabolizes alcohol, carbohydrates, and chemicals. And thyroid disruption from phthalate metabolites may be more extensive for women than for men (Meaker

& Ferguson, 2011). Women also have differential exposures to toxics in that they use more cleaning chemicals, cosmetics, artificial sweeteners, and nonsteroidal anti-inflammatory drugs than do men (Setlow et al., 1998). The field could include issues of delegitimized illnesses such as fibromyalgia, chemical sensitivities, chronic fatigue syndrome, as well as women’s susceptibility to toxic effects of contaminants. The plight of indigenous women in globalization efforts has been almost completely ignored.

Cross-cultural/Diversity studies

Diverse peoples have varying susceptibilities and exposures to toxicants. Understanding difference may include a need to understand varying vulnerabilities as a result of gender and race. Because some toxics are estrogenic, they affect women differently than men. Race also may predispose some people to vulnerability. For example, 16% of African American men have a deficiency of the enzyme G-6-PD (glucose-6-phosphate dehydrogenase), predisposing them to greater risk from environmental oxidants such as ozone and nitrogen dioxide (Rios et al., 1993).

Industrial contamination is now a major threat not only to poor people and people of color in the United States but to indigenous people in more natural cultures, that is, the “third world.” American psychology has generally ignored this issue despite the fact that whole cultures are now on the verge of extinction due to the forced export of industrial capitalism. Generally, large US-based corporations secure funds from the World Bank and implement grand-scale projects such as dams, mines, and deforestation that devastate the lives of residents in the target areas. A commitment to “diversity issues” in psychology must include knowledge that indigenous people are still being forced from their land by colonizing cultures and projects. For example, 20,000 farmers in Kerala India no longer have adequate water for their crops due to the exorbitant use of water by a local recently built Coca Cola factory (Hyams, 2004).

Strategy 2: Senior Capstone in Environment, Health, and Behavior: From Neurobehavioral Toxicology to Ecopsychology

This section presents an outline for a course in “Environment, Health, and Behavior” that introduces ecological and toxicological issues, explores their effects and relevance for psychology, shows students alternative paradigms for worldviews, and introduces the new subfields of ecopsychology, ecotherapy, and ecofeminism. This seminar-style course, which has been taught at James Madison for 10 years, integrates reading, discussion, videos, writing, and creative projects with the aims of challenging the competitive, individualistic,

consumption-oriented industrial paradigm as problematic rather than as “progress,” and situating it as complicit in some of the current major global problems. The course has been taught since 2001 and was initially titled “Ecology and Psychology”; but sadly, students informed me that they did not know what ecology was, and the title was changed in 2004.

Readings

- Johnson, A. (2008). *Amputated lives: Coping with chemical sensitivity*. Brunswick, ME: Cumberland Press.
- Lawson, L. (1993). *Staying well in a toxic world: Understanding environmental illness, multiple chemical sensitivity, chemical injury, and sick building syndrome*. Chicago, IL: Lynnword Press. (Loaned from me due to being out of print.)
- Merchant, C. (2005). *Radical ecology: The search for a livable world* (2nd ed.). New York, NY: Routledge.
- Porritt, J., & Nadler, E. (1991). *Captain Eco and the fate of the earth*. New York, NY: DK Children.
- Roszak, T., Gomes, M. E., & Kanner, A. D. (Eds.). (1995). *Ecopsychology: Restoring the earth, healing the mind*. San Francisco, CA: Sierra Club Books.
- Weber, K. (2009). *Food Inc.: A participant guide: How industrial food is making us sicker, fatter, and poorer—and what you can do about it*. Participant Media and Karl Weber.

In addition, a required Course Pack is available at the bookstore.

Lawson’s book, written in 1993 and heralded as “The *Silent Spring* of the 90s” is an out-of-print book written for the layperson that addresses people’s everyday exposures to toxics at home, in the workplace, and in food, furnishings, and so on. Merchant, Roszak et al., and Lawson are assigned in relevant chapters as the course progresses. Johnson is read all at once when we learn about chemical injury.

Unit I: Introduction to environmental issues

Students know surprisingly little about environmental studies in general (Milbrath, 1995), and Unit I is devoted to addressing this. I rotate videos such as *An Inconvenient Truth* (Guggenheim, 2010), *The 11th Hour* (Conners, 2008) and National Geographic’s *Six Degrees* (Bowman, 2008), combined with written materials to create somewhat of an initial “crash course” in environmental studies. Students are often shocked and motivated by the intensity and extremity of the current state of ecological health of the world and almost always ask why they have not been introduced to these problems before their senior year. The activity of bringing a favorite packaged food to class

and looking the ingredients up in Ruth Winter’s (2009) *A Consumer’s Dictionary of Food Additives* focuses students on the everyday practical level, and they often laugh nervously as they read the descriptions of many of the ingredients in their favorite snacks. Chapter one of Merchant’s (2005) *Radical Ecology* outlines the present environmental crisis, and Roszak’s introduction to his edited (with Mary Gomes and Allen Kanner) book *Ecopsychology* introduces them to a social science view of the consequences of living separate from the earth. I also loan students an out-of-print children’s comic book entitled *Captain Eco*, which quickly reviews the environmental crisis in user-friendly terms. Thus the first two class meetings are spent becoming familiar with the scope of the environmental crisis. Major resources for this unit are listed in the Appendix.

Unit II: The specifics of harm

Unit II comprises two classes that introduce students to toxicology and health, risk assessment, the influence of our Western worldview on health, and the particular issue of pesticides and health. Readings are chosen to reflect a mix of scientific studies and lay readings such as Lawson’s chapter on pesticides to keep students feeling connected but to push them to read science. The open-access journal *Environmental Health Perspectives* is a particularly helpful source of current articles on toxics and health.

Unit III: Toxicology, psychology, and quality of life

Unit III brings the students closer to psychology, addressing neurodevelopmental disorders and neurobehavioral toxicology. Gilbert’s (2008) *Scientific Consensus Statement on Environmental Agents Associated with Neurodevelopmental Disorders* developed by the Collaborative on Health and the Environment’s Learning and Developmental Disabilities Initiative is helpful in getting students to understand that causes for the myriad disorders for which psychology has no cause may indeed lie outside of the field. Papers co-authored by toxicology researcher Bernard Weiss and physician Ted Schettler are also helpful, as is Lisa Morrow’s work on solvents and mental disorders. As students begin to understand that toxics contribute to disease, physical and psychological, I introduce a scientific overview of toxics by Doctor (2002) that addresses a variety of toxics and their particular detailed effects.

Unit IV: Examples of toxicant-induced physical illness

Unit IV delves into radiation, cancer, and chemical injury and sensitivity. Students read about X-rays and radiation including electromagnetic field-induced symptoms, environmental influences on breast cancer and endometriosis, and then address chemical-induced

injury and sensitivity. For breast cancer, students study Breast Cancer Fund's in-depth report on breast cancer and environment (Gray, 2010). The issue of hormone-disrupting chemicals is often a new one for students, and alternatively the book *Our Stolen Future* (Colborn et al., 1997) is an older but lay-focused summary of the presence of and influence of hormone disruption and its effect on daily life. The issue of illness from chemical exposure is addressed in more depth with the use of Alison Johnson's *Amputated Lives* (Johnson, 2008), which addresses severe illness from exposure in four different venues: the Twin Tower bombing, the Exxon Valdez cleanup, exposure to toxins post-Katrina, and the EPA Headquarters debacle. The book discusses Gulf War syndrome, sick building syndrome, and multiple chemical sensitivity.

Unit V: Unequal distribution of harm: toxins, populations, and community

In Unit V we discuss the unequal harm from toxics both domestically and globally. We begin with a look at environmental racism using an article on the health of Latino children in the US (Carter-Pokras et al., 2007) and Bullard, Mohai, Saha, and Wright's (2007) *Toxic Wastes and Race at Twenty 1987–2007*. Students come to understand the influence of socioeconomic status and race for exposures in the home. The role of race in the choosing of sites for toxic facilities and the resultant destruction of quality of life for minority persons living in these regions is addressed by the report. The CNN film *Toxic Towns* is a helpful look at what happens to towns when they are surrounded by industrial contaminating facilities. As an extension of this we then read several short articles from the *Ecologist* that address the global impact of siting industrial facilities in indigenous areas. A particularly hard-hitting topic is the contamination of Ecuador by the oil companies, and the video *Trinkets and Beads* is a very powerful venue for addressing the topic. Graydon's (2007) update of the film *Jungle Law* helps keep students current on this long-lasting legal battle that has even more current development that can be found online. Students are often horrified to find that Coca Cola has contaminated land and squandered water in Kerala India to the extent that 20,000 farmers are unable to irrigate their fields (Hyams, 2004).

Unit VI: Critiques of Western industrialism

Unit VI begins to take students in new directions by offering criticisms of a Western lifestyle from ecopsychology and international scholars such as Maria Mies and Vandana Shiva. Maria Mies (1993) apprises readers that catching-up development is not only a myth but impossible. We still subscribe to this myth, thus this 1993 book chapter is still relevant. Durning's (1995) "Are We Happy Yet?"

is helpful in getting students to understand and admit that happiness does not even seem to correlate with having more things. Merchant's (2005) chapter on anti-globalization and sustainability is a more current assessment of the direction that unlimited growth has taken us. By this point in the course students have begun to comprehend the vast importance of sustainability and are able to turn a lens on the self to appreciate their own contribution to the environmental crisis. Kanner and Gomes' "The All-Consuming Self" (in Roszak et al., 1995) is helpful with this exercise.

Unit VII: New fields of study

In Unit VII we study ecofeminism and ecopsychology further, peruse literature on sustainable agriculture, and visit an organic farm. By now students are ready for the ecofeminists, and I purposely assign readings to stretch their thinking into paradigms other than the Western Baconian tradition. We continue to read Merchant and add two chapters from Ausubel's (2004) *Ecological Medicine: Healing the Earth, Healing Ourselves*. I particularly like the chapters by Low Dog and Harrison on herbal medicine (see the Appendix). In addition I assign Marti Kheel's (1993) chapter "From Healing Herbs to Deadly Drugs" in Greta Gaard's book *Ecofeminism: Women, Animals, Nature*. Students are asked to bring a medicinal herb to class and to teach their classmates about that herb. Class 12 is an incredible experience for me, the instructor, as I look across the conference table at 12 students, each with a medicinal herb plant sitting in front of them.

We then visit Roszak et al. (1995) in detail, with several of the chapters assigned to the entire group and the remainder given to one student each for reading and explaining to the class. I like Shepard's *Nature and Madness* because of his critique of Western culture in developmental terms (we are ontogenetically crippled in that we are stuck at a very immature level of development compared with more indigenous cultures that value patience and related virtues rather than our race to accumulate). Students often need some discussion to understand Shepard, and for this and several other articles in the course I use reading guides where students are to answer and hand in a series of questions about the article. This assures that students read the material in great enough depth to be able to truly contribute to class discussion and understanding.

For the second to last week of class students read *Food Inc.* and visit an organic farm. Both the book and the video *Food Inc.* are very helpful for students in understanding agriculture, which is often the means of spreading the industrial paradigm to initially more sustainable cultures. The hands-on trip to my friend's farm has students petting animals, walking through gardens, and experiencing the connection to the earth that they have been reading about all

semester. Instructors may have to explain before the visit that flip-flops are not appropriate farm shoes.

Our final class is spent discussing the farm, eating snacks, and delivering their final project, a 3-D construction of their future sustainable occupation. Students use sustainable materials to construct their occupation integrating the principles of ecopsychology and sustainability. Over the course of teaching this class I have seen sustainable medical and counseling offices, a gym powered by seawater, an outdoor education facility, and a host of other creative projects.

Assignments include three APA-style summary papers, an ecofeminist dialogue, the 3-D project, and a co-presentation on an environmental challenge and a group that is addressing it. The summary papers use the readings from particular units to answer an integrative question and essentially take the place of any exams for the class. The presentation widens the purview of the class and allows students to introduce issues of their choice to their classmates, thus taking some ownership for new information. The ecofeminist dialogue (described below in Assignments) is essentially a discussion between an SUV-driving hunter and an ecofeminist, and students have fun writing this. Assignments are listed in detail in the Appendix.

Student feedback

Students are initially shocked at the volume of environmental knowledge available and the fact that this is the first course that has addressed it. There is some emotional struggle to face and decide how to respond to the conception that the world is in a more difficult state than they had realized. Some also struggle with making connections with the earth for the first time, having grown up in large suburbs with the concomitant distance from the natural environment. The following student comments address the realization of the importance of the subject: "At first you wonder how it is a psychology class. But once you get involved you clearly see the importance of this class & material."

"I came into the course completely unaware of many of the topics. The course really broadened my horizons on environmental issues."

Sometimes students find their life's work as a result: "This class was very informative. It changed my life and goals. I now want to work for the EPA and change how they run things."

And finally, they express that environmental literacy should be an integral part of their psychology curriculum: "I only wish these principles were introduced in Psych 101 and carried throughout all of the psychology program."

Conclusion

This course, although off the beaten path of mainstream psychology, has been well received by students and has contributed to

their understanding of ecological issues and their relation to psychology. For some it is life-changing. I have received e-mails from students who now work in medicine, outdoor education, and in other fields for whom the course was pivotal. For most it at minimum improves their understanding of environmental and global health issues and improves their quality of life.

Appendix

Assignments

Summary Paper Part 1: What are you exposed to? Minimum 6 pages. 30 points. Must be in APA style. Write a review/summary paper of the kinds of health risks posed by common toxins including pesticides. Reference all the readings to date. Find out if your dorm/apartment is sprayed regularly and with what. How easy was it to get the information? How will you respond? What could be done to better protect people?

Summary Paper Part 2: Where pollution strikes most. Minimum 7 pages. 35 points. APA style. In what ways does harm from environmental toxins seem to be unevenly distributed in the population? What are "xenoestrogens," and why are they a concern? What groups are most at risk, and why? Discuss both differential vulnerability and differential exposure patterns including both toxicant-induced conditions and the populations that suffer from them. Be sure to include MCS, SBS, GWS, environmental racism, and radiation.

Summary Paper Part 3: Western industrialism under fire. Minimum 5 pages. 25 points. APA style. What criticisms have been leveled at our Western lifestyle both from US psychologists and non-Western writers? Why has psychology not entered the debate on the environment? What would psychology gain as a result of acknowledging environmental influences on health/what would it lose?

Dialogue: Ecofeminism. 20 points. Write the dialogue that ensues between the following two characters: A man in fatigues enters a bar after a long day of hunting. With his quarry strapped to the roof of his truck, he plans to eat and rest before embarking on the long drive home. At the bar sits a woman wearing comfortable clothes and hiking boots. Unbeknownst to him she has just returned from an ecofeminist conference where she presented a paper entitled "Masculinity, Hunting, and Violence Against Nature." The man assumes she is an "outdoor type" much like himself and approaches her saying: "Hi. Can I buy us a couple of steaks?" What happens next? Use your readings.

Project: Ecotherapy/Ecoeducation in practice. 20 points. Design your future occupational setting visually (poster, paint, 3-D, etc.) incorporating sustainability and ecopsychology. Your occupation could be therapy, teaching, consulting, or other. Illustrate the use of environmental principles in the setting and submit it along with a short (2–3 page) description of what you have done and why. Be sure to integrate the readings into your description.

Co-Presentation: Environmental activism local and global. 25 points. Due relevant week. Students will present to the class regarding an activist group that is addressing a serious environmental problem. Presentation should be at least 20 minutes long and include the following: First address the history and seriousness of the problem being addressed, consequences of the problem for environment, people, animals, etc., and other attempts to address the problem. (This means you will have to do some library research into the problem.) Then profile your activist group and summarize their efforts on behalf of this problem. Include their methods, results, and consequences. The group can be local, global, distant, etc. Any visual aids or educational materials gathered from the activist group will enhance your presentation. As a result of hearing/seeing your presentation the class should have a good understanding of the problem and what your particular group has contributed to its understanding and/or amelioration. Groups should be identified early in order to present on relevant weeks.

Unit resources

Unit I Resources:

Lawson, L. (1993). *Staying well in a toxic world: Understanding environmental illness, multiple chemical sensitivity, chemical injury, and sick building syndrome*. Chicago, IL: Lynnword Press.

Merchant, C. (2005). Chapter 1: The global ecological crisis. In *Radical ecology: The search for a livable world* (2nd ed.; pp. 17–39). New York, NY: Routledge.

Milbrath, L.W. (1995). Psychological, cultural, and informational barriers to sustainability. *Journal of Social Issues*, 51, 101–120.

Porritt, J., & Nadler, E. (1991). *Captain Eco and the fate of the earth*. New York, NY: DK Children.

Roszak, T. (1995). Where psyche meets Gaia. In T. Roszak, M. E. Gomes, & A. D. Kanner (Eds.), *Ecopsychology: Restoring the earth, healing the mind* (pp. 1–17). San Francisco, CA: Sierra Club Books.

Winter, R. (2009). *A consumer's dictionary of food additives, 7th edition: Descriptions in plain English of more than 12,000*

ingredients both harmful and desirable found in foods. New York, NY: Three Rivers Press.

Videos:

Bowman, R. (Director). (2008). *Six degrees could change the world*. National Geographic Video.

Connors, N. (Director). (2008). *The 11th hour*. Warner Home Video.

Guggenheim, D. (Director). (2010). *An inconvenient truth*. Paramount.

Unit II Resources:

Carozza, S. E., Li, B., Elgethun, K., & Whitworth, R. (2008). Risk of childhood cancers associated with residence in agriculturally intense areas in the United States. *Environmental Health Perspectives*, 116, 559–565. Available on BB and at www.EHPonline.org

Environmental Health Perspectives. Open access journal available at www.EHPonline.org

Lawson, L. (1993). Chapters 3 & 4. In *Staying well in a toxic world: Understanding environmental illness, multiple chemical sensitivity, chemical injury, and sick building syndrome*. Chicago, IL: Lynnword Press.

Lawson, L. (1993). Chapter 7: Fighting the deadly dandelion. In *Staying well in a toxic world: Understanding environmental illness, multiple chemical sensitivity, chemical injury, and sick building syndrome*. Chicago, IL: Lynnword Press.

Merchant, C. (2005). Chapter 2: Science and worldviews. In *Radical ecology: The search for a livable world* (2nd ed.; pp. 41–60). New York, NY: Routledge.

Montague, P. (2004). Quantifying the unknowable: The risks of risk assessment. In K. Ausubel (Ed.), *Ecological medicine* (pp. 53–57). San Francisco, CA: Sierra Club Books.

Schettler, T. (2002). Changing patterns of disease: Human health and the environment. *San Francisco Medicine: Journal of the San Francisco Medical Society*, 75, 11–13.

Solomon, G. M. (2002). Rare and common diseases in environmental health. *San Francisco Medicine: Journal of the San Francisco Medical Society*, 75, 14–16.

Video:

United Farm Workers. (1988). *The Wrath of Grapes*, 15 minutes.

Websites:

www.mssm.edu/research/institutes/child-health-and-development-institute.

aaidd.org. Web site of the Environmental Health Initiative of the American Association on Intellectual and Developmental Disabilities. Under Conferences and Events, choose Teleconferences and Webinars and scroll down.

Unit III Resources:

- Doctor, S. V. (2002). Neuropsychiatric aspects of poisons and toxins. In S. C. Yidofsky & R. E. Hales (Eds.), *The American psychiatric publishing textbook of neuropsychiatry and clinical neurosciences* (4th ed.; pp. 877–898). Washington, DC: American Psychiatric Publishing Inc.
- Gilbert, S. G. (2008). *Scientific consensus statement on environmental agents associated with neurodevelopmental disorders*. Developed by the Collaborator on Health and the Environment's Learning and Developmental Disabilities Initiative February 20, 2008. On Blackboard.
- Koger, S. M., Schettler, T., & Weiss, B. (2005). Environmental toxicants and developmental disabilities. *American Psychologist*, 60, 243–255. (Packet)
- Metzner, R. (1995). The psychopathology of the human-nature relationship. In T. Roszak, M. E. Gomes, & A. D. Kanner (Eds.), *Ecopsychology: Restoring the earth, healing the mind* (pp. 55–67). San Francisco, CA: Sierra Club Books.
- Morrow, L. A., Gibson, C., Bagovich, G. R., Stein, L., Condray, R., & Allene, S. (2000). Increased incidence of anxiety and depressive disorders in persons with organic solvent exposure. *Psychosomatic Medicine*, 62, 746–750. (Packet)
- Walker, B. (2000). Neurobehavioral toxicity. *Journal of the National Medical Association*, 92, 116–124.
- Weiss, B. (1983). Behavioral toxicology and environmental health science: Opportunity and challenge for psychology. *American Psychologist*, 38, 1174–1187.
- Video:
- CNN. (2010) *Toxic Childhood*, 45 minutes.

Unit IV Resources:

- Ballweg, M. (1995). Chapter 14: Endometriosis and environmental toxins. In *The endometriosis sourcebook* (pp. 377–397). Chicago, IL: Contemporary Books.
- Colborn, T., Dumanoski, D., & Myers, J. P. (1997). *Our stolen future: Are we threatening our fertility, intelligence, and survival? A scientific detective story*. New York, NY: Penguin.
- Firstenberg, A. (2004). Killing fields. *Ecologist*, 34, 22–25.
- Gray, J. (2010). *State of the evidence: What is the connection between the environment and breast cancer?* (6th ed.). Breast Cancer Action. Available at <http://www.breastcancerfund.org/media/publications/state-of-the-evidence>
- Hudson, D., Miller, K., & Briggs, J. (1995, November). The tiny victims of Desert Storm. *Life Magazine*, 46–52, 54, 56, 58–60, 62.

Johnson, A. (2008). *Amputated lives: Coping with chemical sensitivity*. Brunswick, ME: Cumberland Press. Available at www.alisonjohnsonmcs.com

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Videos:

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