

Environmental Literacy and Awareness of Honors Program Students

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## *Introduction*

As a senior student at DePaul University, I consider our school's latest refrain, "Urban Educated; World Ready." For some, "world" may constitute that vague "real world" we face the day after graduation from an institution of higher education. For me, I see "world" as "global." I came to college a kid formed by high school participation in Model United Nations, advanced placement coursework, and environmental club. Global interconnection is a theme that has been present from day one of my higher education, as my application for our university's Honors Program was a book review discussing globalization. My four years of urban education have provided space for me to connect my interest in ecological processes with economic, social and environmental realities. Much of this connection has come in the coursework of the Honors Program.

As described on the university's website, the Honors Program "fosters critical thinking, self-reflection and an examination of values; encourages active, participatory learning; and promotes interdisciplinary and cross-cultural studies" through its small seminar-style courses. In *Philosophical Inquiry*, I explored the interaction of time and ethics related to foreign aid to countries impacted by natural disasters. In *States, Markets, and Societies*, I critiqued the International Monetary Fund's lack of local insight in its implementation programs. In *Cognitive Studies*, I applied the multi-level framework with which we study the brain to systems of food production. Through all, I was challenged to apply ancient concepts to contemporary actualities and to understand various economic, political, and epistemological models. In other words, has been impossible to isolate knowledge of concepts such as the carbon cycle from interdisciplinary scrutiny or comparison to past events.

Whether it was in an Interdisciplinary Arts course on French Impressionism or Multiculturalism Seminar on Immigration in Post-1945 Europe, I recognized my engagement with the program's curriculum took place in the context of an era named by social theorists as postmodern. Sparked largely by the industrial and technological developments of the modern era (16th century – mid 19th century), globalization of resources use and idea exchange has heralded a postmodern era characterized by new forms of social organization, politics, and culture. As a teaching assistant for Honors Environmental Science course, I often invited my fellow students to connect our lab science inquiry to their respective majors, which ranged from computer science to creative writing to business and peace, justice, and conflict studies. At the same time, I challenged students and reminded students of the key concepts of such scientific inquiry and understanding. When a student reported on the corrupt politics that have all allowed lead pollution in Chicago, I asked the professor to briefly explain what smelting, of metal from its ore, actually was, and I recalled some everyday infrastructure and products made of metal. At the end of the course, one of my parting lines to the group of students went, "remember the processes that produce this pollution are the processes make material products we use so if we're upset about the pollution, we need to be conscious of our consumer choices. I know there's a lot out of our control, but perpetual humble invitation to find simplicity and maybe buy a cotton shirt next time you need a shirt."

Two public conversations in which I have engaged with honors program peers have been the Lead crisis in Flint, Michigan (January 2016) and the United Nations Climate Change Conference (COP 21) in Paris (December 2015). Both conversations have highlighted how popular media's coverage and the public's engagement with contemporary environmental challenges can be dominated by headlines and buzzwords. As a person who is passionate about environmental concern, scientific literacy, and engaged citizenship I believe, "global realities mean global responsibility." My experience as a student, role as a

teaching assistant, and intended career path in sustainable land management and environmental policy have motivated me to compose a three-part senior thesis project on Environmental Education for Sustainable Development. Each section can be used as tool to better understand and implement this manifestation of interdisciplinary learning.

The assemblies, conferences, and specialized agencies of the United Nations (UN) constitute one of the main platforms for global conversation on the growing interconnectedness of economic, social and environmental realities. Environmental Education for Sustainable Development is a combination of two concepts that have evolved over the last 40 years. In *A series of conferences, conventions, and commissions; key dates and players in Environmental Education for Sustainable Development*, I address the historical and institutional context of this 20<sup>th</sup> century connection between higher education and global development, so that we can better recognize the origin and operation of these concepts.

As the global conversation on Environmental Education and Sustainable Development has evolved, so has study by scholars of educational theory. Such study is important because the merit and effectiveness of education needs to be continually checked. To ensure complete consideration of the role of environmental education (EE) and to emphasize its legitimate “fundamental and unavoidable” role (instead of a “mere fashion, a slogan or a label”) in contemporary education, scholar Lucie Sauvé searches for a framework that draws on the strengths of both the modern and post-modern eras. In a response to Sauvé, scholar John Huckle articulates the need to consider the complexities of postmodernity in development of environmental education for sustainable development. He criticizes Sauvé and other critical theorists for neglecting the “material realities of global capitalism.” While this particular dialogue between Sauvé and Huckle took place 20 years ago, it is worth re-visiting today. In *Critical analysis from education experts*, I distill the perspectives of Sauvé and Huckle, so that we can better understand and apply their important work.

I argue Sauvé’s concern is valid. Directly following the UN’s explicit connection between EE and Sustainable Development, she argues not that this connection is bad, but that we need to be conscious of the risk it poses to the depth and legitimacy of EE. Based on my academic experience in the Honors Program, I believe the depth of environmental education is strengthened by and requires post-modernist perspectives. The legitimacy of environmental education needs to continue to include foundational disciplined-based knowledge characteristic of a modernist perspective. I argue Huckle’s challenge is valid. As we develop environmental education in the context of sustainable development, we need to directly engage the material realities associated with economic and social development. As described above, the coursework of the Honors Program has offered for my own engagement of this sort. I am motivated to explore the application of the concepts laid out in global documents and educational theory within this academic community. In *Environmental Literacy and Awareness of DePaul Honors Program Students*, I outline the composition, implementation, and analysis of a direct online survey of my peers, so that we can check-in with current undergraduate students with and move forward accordingly.

*A series of conferences, conventions, and commissions; key dates and players in Environmental Education for Sustainable Development*

## **Environmental Education**

The first United Nations Conference on the Human Environment took place in 1972 in Stockholm, Sweden. Among the attendees were 133 member states, a number of intergovernmental organizations, nongovernmental organizations, and specialized agencies, was the United Nations Educational, Scientific and Cultural Organization (UNESCO). UNESCO is a specialized agency within the United Nations that facilitates the translation and preservation of educational, scientific, and cultural knowledge in the forms of places, objects of significance, and ideas. The outcomes of this conference were a publication of a statement of 26 guiding principles (called the Stockholm Declaration) and publication of 109 recommendations for international environmental action, which included recommendations for creation of United Nations Environment Program (UNEP, established after conference in 1972). ( ) In Recommendation 96 of the action plan, under “Educational, Informational, Social and Cultural Aspects of Environmental Issues”, UNESCO was charged with establishing an international program of environmental education (EE). ( )

During the subsequent 1975 International Environmental Workshop in Belgrade, Yugoslavia, UNESCO led the composition of a charter that established the goal of environmental education; “to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.” ( )

In 1977, UNESCO and UNEP organized the world’s first Intergovernmental Conference on Environmental Education. 66 member states, 2 nonmember states, 8 UN agencies and programs, 3 other intergovernmental organizations, and 20 international nongovernmental organizations met in Tbilisi, Georgia (USSR). The outcomes of this conference were a statement of process-based and community-engaged environmental education (called the Tbilisi Declaration) and 41 recommendations for the role, objectives, guiding principles, and international development of environmental education. Recommendation No. 1 outlines 11 criteria for EE and Recommendation No. 2 endorses 3 goals of EE, 4 categories of EE objectives, and 12 guiding principles for EE. ( )

## **Sustainable Development**

As defined in Our Common Future: Report of the World Commission on Environment and Development (WCED), sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” ( ) Known as the Brundtland Report, the document served as the foundation for the United Nations Conference on Environment and Development. This meeting of 172 governments and some 2,400 representatives of non-governmental organizations was held in Rio de Janeiro, Brazil in 1992. The outcomes of this conference were a statement of 27 guiding principles (called the Rio Declaration), a 40-chapter global plan for action (called Agenda 21), and establishment of three instruments of environmental governance (the UN Framework Convention on Climate Change, the Convention on Biological Diversity, and Statement of Forest Principles). Among the recommendations was one to create a functional commission within the UN Economic and Social Council (ECOSOC) to review and implement Agenda 21.

This 53 member state body was created in December 1992 and is called the Commission on Sustainable Development (CSD).

### **Environmental Education for Sustainable Development**

The global plan adopted in Agenda 21 “further reaffirmed that sustainable development was delimited by the integration of economic, social and environmental pillars.” ( ) An important intersection of these pillars is found in Section 1V, which outlines the plan’s Means of Implementation. UNESCO led composition of Ch. 36 of Sec. 1V, “Promoting education, public awareness and training.” The objectives of Ch. 36 include:

“to promote integration of environment and development (economic and social) education, including demography, in all educational programmes, in particular the analysis of the causes of major environment and development issues in a local context, drawing on the best available scientific evidence and other appropriate sources of knowledge, and giving special emphasis to the further training of decision makers at all levels.”

In 1996, the UN Commission on Sustainable Development (CSD) called upon UNESCO “to refine the concept and key messages of education for sustainable development” In response, UNESCO published *Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action*. The 6 section proposal includes Section III., “Reorienting Education to Support Sustainability” Of the 34 points (57-91) in Section III., 6 are devoted to the “Contribution of Environmental Education.” The conferences in Stockholm and in Tbilisi are both referenced in separate lines (83 & 84), and there is a single line (85) that states, “These principles were successfully translated into educational goals and, with greater difficulty, into schoolroom practice in many countries.”

#### *Critical analysis from education experts*

The explicit connection between environmental education and sustainable development in UNESCO’s 1996 proposal led Lucie Sauvé, a professor of education at University of Quebec, to offer critical analysis in her article, *Education between Modernity and Postmodernity: Searching for an Integrating Educational Framework*. In her analysis, Sauvé expands on the epistemological, ethical, and pedagogical basis of these proposals. In other words, Suave is interested in the mechanisms of knowledge, values that motivate, and framework of teaching that underlies environmental education for sustainable development.

Sauvé highlights the postmodern preference to dialogue between different forms of knowledge (scientific, experiential, traditional), instead of confining education to traditional academic disciplines. In other words, how we determine the validity of facts is becoming more and more relevant in educational discourse. This is because the dynamic exchange between theory and practice is preferable compared to a justification based on a pre-established truth. Ultimately, she articulated the concern that “environmental education is here reduced to being an instrumental tool in a long list of other types of ‘education for...’ all intended to serve the finality of sustainable development.” Essentially, environmental education can be a means to an end for sustainable development, however, there is risk of losing the depth of environmental education if we ignore its foundations in scientific disciplines. To ensure complete consideration of the role of environmental education and to emphasize its legitimate “fundamental and avoidable” role (instead of a “mere fashion, a slogan or a label”) in contemporary

education, Sauv  searches for a framework that draws on the strengths of both the modern and post-modern eras.

A modernist perspective of EE highlights unity and universal values and, and points out the threats of multiplicity of perspectives to the establishment of certainty. In this light, Sauv  argues for defined standards to make environmental education more uniform... At the same time, Sauv  advocates for a postmodernist perspective of EE that frames the relationships among persons, social groups and the environment as a network. Ultimately, Sauv  argues that the gap between discourse and practice is what leads to confusion and loss of effectiveness of EE. In other words, it is not discord in discourse that is the problem, it is disconnect between theory and practice; between what/how we teach and what/how we do.

In a response to Sauv , John Huckle, a consultant on education for sustainable development, articulates the need to consider the complexities of postmodernity in development of environmental education for sustainable development. He criticizes Sauv  and other critical theorists for neglecting the "material realities of global capitalism." In other words, it is not discord in discourse that is the problem, but it is the context of that discourse. Huckle advocates for connection between theory and practice that begins during the learning process; we need to connect what/how we teach with what/how we do as we teach.

To connect theory and practice, Sauv  presents three interacting spheres: the Self Sphere of Identity, the Others Sphere of otherness, and the Environment Sphere of relations. She maintains this model makes it possible to find a specific and multidimensional educational area for EE, as the environment (Relations) sphere refers to a field of interactions essential for the full development for the person and his/her related social group.

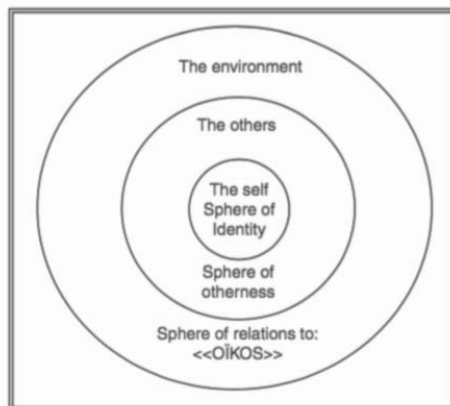


Figure 1. The three interrelated spheres of personal and social development.

Huckle argues that Sauv 's model of three spheres "rightly hints at the way in which adjectival or transformative educations might best be combined within education for global citizenship, but fails to suggest the key concepts and ideas that such an education might explore." He argues that the dynamic exchange between theory and practice needs to include participative action research as an educational process of critiquing the ideals which we are teaching. This allows students and teachers to research diverse technologies and discourse that claim the label of sustainability, while at the same time clarifying their ethical and political commitments.

Based on this background, I argue Sauv 's concern is valid. Reducing EE to a tool used for finality of sustainable development is a risk to the depth and legitimacy of EE. To me, the depth of environmental education is strengthened by and requires post-modernist perspectives. The legitimacy of environmental education needs to continue to include foundational discipline-based knowledge.

I argue that EE's "uniformity" needs to come from understanding of the ecological processes, scientific method of inquiry, and understanding of current economic model. In other words, my worry is losing the practical and physical foundation of our use of natural resources amidst post-modernist rhetoric. It is dangerous to stray from the material realities of the ecological processes that feed our economic, social, and environmental models. Critical thinking needs to include a set of knowledge and skills that are inherently based in disciplines of academic inquiry. Ultimately, to move forward in sustainable development in an age of global citizenship, I agree with Sauv  that we need to connect theory and application of educational discourse.

To make this connection, I agree with Huckle on the need for participative action research. As Sauv 's title suggests she is "searching", and I recognize the place of her analysis as one of active, open-ended reflection and I agree with Huckle on the need to suggest topics that such an education may explore. Later in his critique, Huckle explains that instead of a "banking" education restricted to transfer of facts, there is need for a "transformative" education that provides students with the knowledge, skills and attitudes to experience an inclusive educational experience in which each student has agency in the learning process.

#### *Environmental Literacy and Awareness of DePaul Honors Program Students*

##### **Survey Composition and Administration**

I met Huckle's suggestion by compiling a survey of questions that explore topics relevant to the evolution of environmental education. The survey consists of the following sections: multiple choice, fact-based questions on Environmental Literacy ( ), Scientific Literacy ( ), Economic Literacy ( ). Environmental Concern, Lifestyle, Action, Environmental Awareness/Care/Choice, and Demographic Information. A majority of the questions were gathered from previous surveys (CITATIONS), and a few questions were created originally for this survey. Appendix A lists the questions and their source.

I considered Sauv 's comments on modernist/post-modernist perspectives along with her three-sphere (Identity, Otherness, and Relations) model as I composed and compiled questions for the survey. The categories and questions of literacy questions were intentionally chosen to measure student response on fact-based questions on the ecological underpinnings of our natural resources, the fundamental concepts and skills of scientific inquiry, and the topics in economics textbooks related to use of natural resources. These measure what I named above as a necessary "uniformity" or modernist discipline-based foundation. The Environmental Awareness/Care/Choice questions align with the post-modern paradigm of recognizing interaction between a person's attitudes and action. Finally, the demographic information allows for exploration of the influence of different factors on responses to these questions. The survey was created using DePaul's Qualtrics platform.

To administer the survey, I emailed each professor of an Honors Program Spring 2016 course individually, requesting class time to introduce the survey, write the url on the board, and have students complete the survey in class. I visited 9 classes between April 26 and May 5. Approximately 80% of survey responses were obtained via in-class administration. If a professor did not respond within a week professors, I sent a follow-up email with the survey link and request to pass along the link to their students. Likewise, for professors who responded but could not offer class time, I followed-up in the same manner. Finally, I shared the survey link on the Honors Student Government Facebook Page, on the Honors Program Facebook Page, and in a select number of emails to peers from past courses. This survey was approved by DePaul University’s Institutional Review Board.

**Analysis of Responses**

Choice text results, which present responses by response id and text responses for each question, were downloaded from Qualtrics. For each

**Survey Results**

Demographic parameters of year in school and college of study the survey population were provided by Jennifer Kosco, assistant director of the Honors Program. As of Spring 2016, there were 783 students enrolled in the honors students. A total of 169 students completed this survey. A breakdown of survey population and survey sample are presented in Tables 1 and 2. The fact that the breakdown of our survey sample by school and year mirrors that of our survey population indicates that our sample is fairly representative of our population.

Of the 169 respondents who answered the literacy questions, the average literary scores (proportion correct +/- 1 standard deviation) for Environmental Literacy, Science Literacy, and Economic Literacy were 0.62 +/- 0.56 +/- , and 0.33 +/- respectively. The distribution of answers for each question and a full summary of demographic information is found in Appendix B.

School	Honors Program Population	Percent of Honors Program Population	Survey Sample	Percent of Survey Sample
LAS	215	27.46	40	27.78
CSH	163	20.82	36	25.00
BUS	176	22.48	29	20.14
CDM	99	12.64	23	15.97
COM	66	8.43	13	9.03
EDU	21	2.68	2	1.39
THE	19	2.43	1	0.69
MUS	24	3.07	0	0
<b>Total</b>	<b>783</b>	<b>100</b>	<b>144*</b>	<b>100</b>
Year	Honors Program Population	Percent of Honors Program Population	Survey Sample	Percent of Survey Sample



Freshman	231	29.5	64	37.87
Sophomore	185	23.63	25	18.38
Junior	186	23.75	25	18.38
Senior	156	19.92	22	16.18

Table 1. Distribution of students by college for survey population and survey sample.

Table 2. Distribution of students by year for survey population and survey sample.

**Table 3.**

COLLEGE	n	ENV LIT	<i>SD</i>	SCI LIT	<i>SD</i>	ECON LIT	<i>SD</i>
LAS	40	0.68	0.14	0.63	0.30	0.36	0.23
CSH	36	0.66	0.15	0.61	0.30	0.36	0.19
BUS	29	0.59	0.20	0.47	0.32	0.32	0.18
CDM	23	0.64	0.18	0.67	0.32	0.40	0.20
COM	13	0.52	0.22	0.44	0.37	0.42	0.21
DEGREE TYPE	n	ENV LIT	<i>SD</i>	SCI LIT	<i>SD</i>	ECON LIT	<i>SD</i>
Bachelors of Arts (B.A.)	69	0.63	0.17	0.60	0.32	0.36	0.20
Bachelors of Fine Arts (B.F.A.)	5	0.50	0.18	0.67	0.24	0.40	0.22
Bachelors of Science (B.S.)	57	0.62	0.21	0.58	0.29	0.32	0.19
YEAR	n	ENV LIT	<i>SD</i>	SCI LIT	<i>SD</i>	ECON LIT	<i>SD</i>
Freshman	64	0.61	0.19	0.56	0.31	0.37	0.21
Sophomore	25	0.68	0.14	0.61	0.34	0.34	0.18
Junior	25	0.62	0.24	0.67	0.29	0.37	0.16
Senior	22	0.63	0.15	0.53	0.30	0.31	0.23
STUDY ABROAD	n	ENV LIT	<i>SD</i>	SCI LIT	<i>SD</i>	ECON LIT	<i>SD</i>

Yes	27	0.66	0.16	0.68	0.33	0.39	0.22
No	107	0.62	0.19	0.56	0.31	0.34	0.19
RELEVANT HON COURSES	n	ENV LIT	SD	SCI LIT	SD	ECON LIT	SD
HON 100 - Rhetoric and Critical Inquiry	131	0.63	0.18	0.59	0.31	0.35	0.20
HON 105 - Philosophical Inquiry	105	0.63	0.18	0.58	0.32	0.34	0.19
HON 180 - Data Analysis and Statistics	61	0.60	0.18	0.60	0.30	0.34	0.21
HON 201 - States, Markets, and Societies	58	0.62	0.19	0.60	0.32	0.34	0.19
HON 225 - Honors Lab Science Topics	46	0.63	0.17	0.63	0.29	0.38	0.20
HON 300 – Honors Research Seminar	14	0.55	0.14	0.64	0.33	0.29	0.26
ENVIRONMENT OF UPBRINGING	n	ENV LIT	SD	SCI LIT	SD	ECON LIT	SD
Rural	13	0.60	0.19	0.64	0.35	0.33	0.24
Suburban	94	0.62	0.19	0.58	0.31	0.36	0.19
Urban	28	0.66	0.16	0.58	0.30	0.34	0.22
POLITICAL PARTY	n	ENV LIT	SD	SCI LIT	SD	ECON LIT	SD
Independent	41	0.64	0.18	0.62	0.32	0.35	0.19
Democrat	76	0.63	0.19	0.60	0.30	0.34	0.20
Libertarian	3	0.75	0.00	0.67	0.33	0.50	0.25
Republican	13	0.54	0.22	0.44	0.28	0.40	0.16

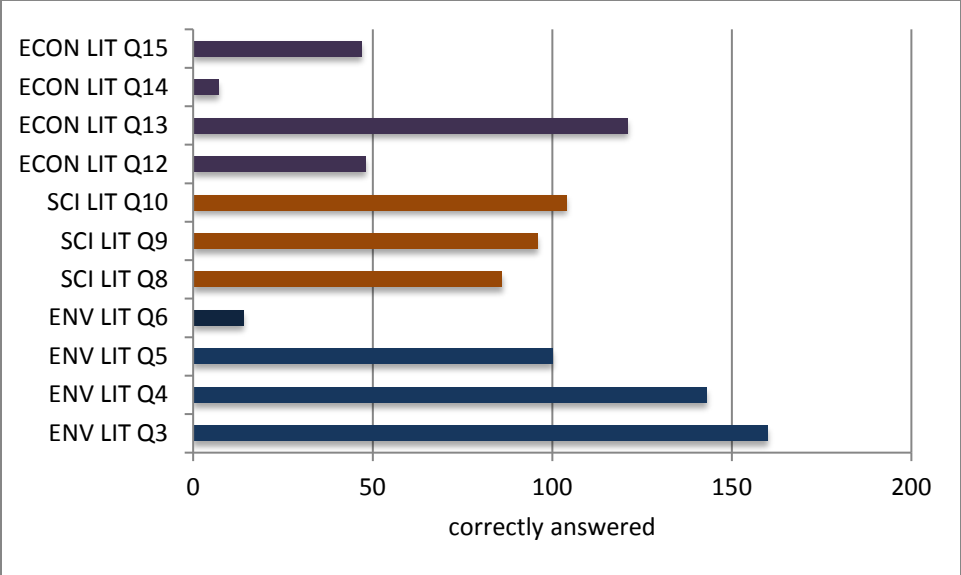
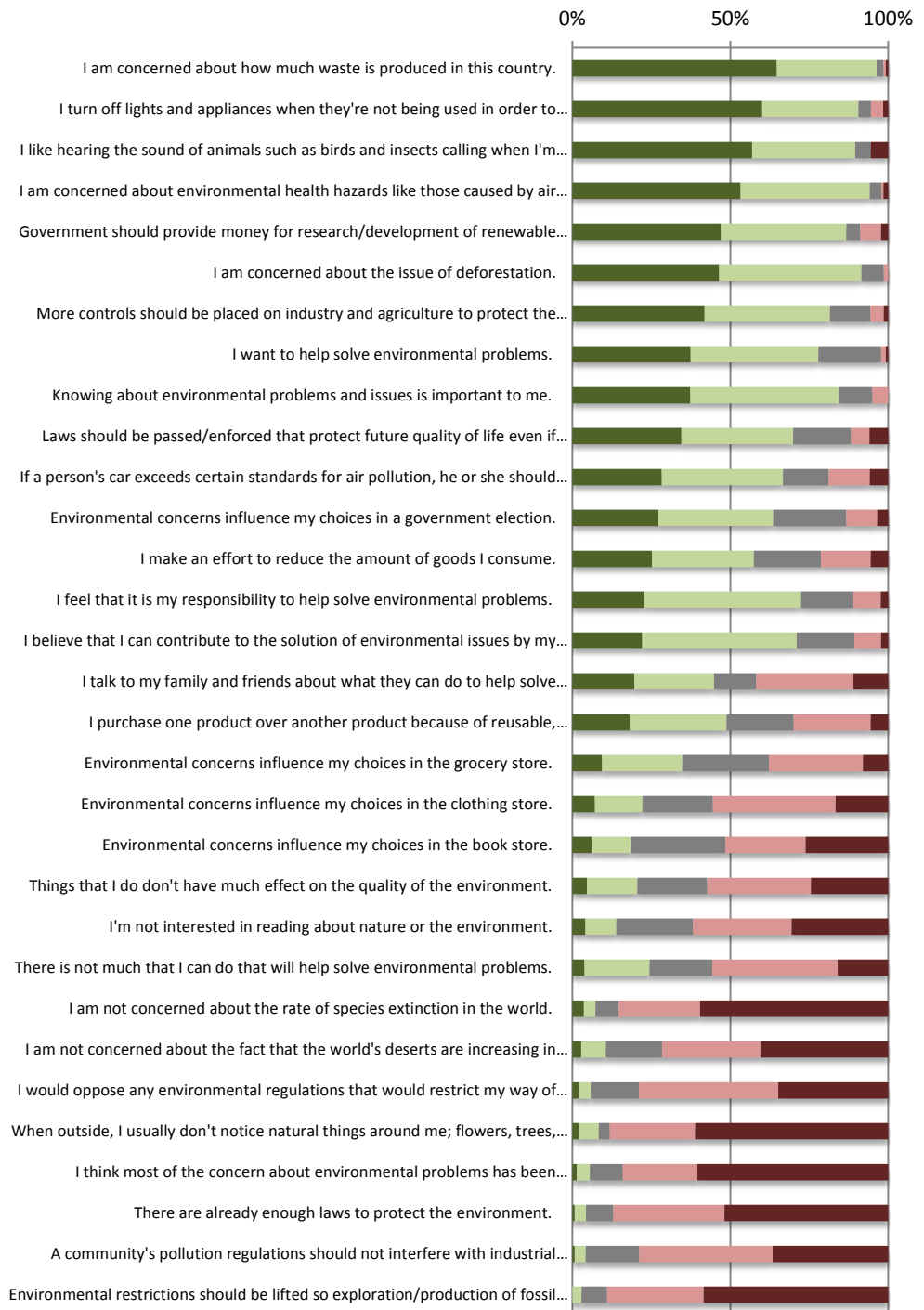
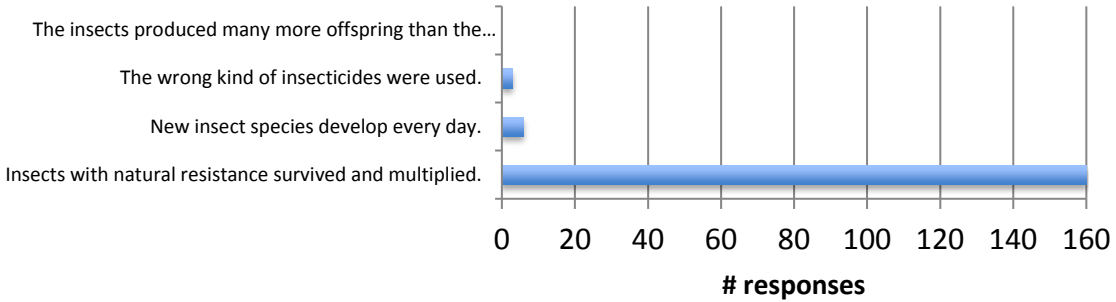


Fig 1.

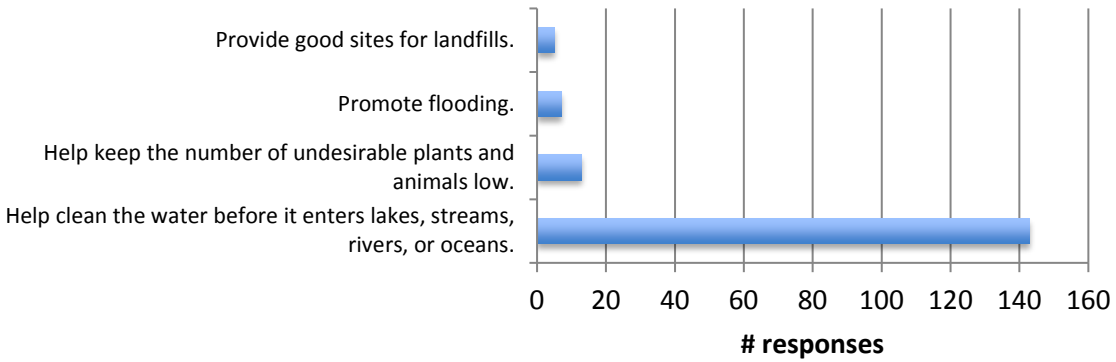
■ Strongly agree 
 ■ Somewhat agree 
 ■ Neither agree nor disagree 
 ■ Somewhat disagree 
 ■ Strongly disagree



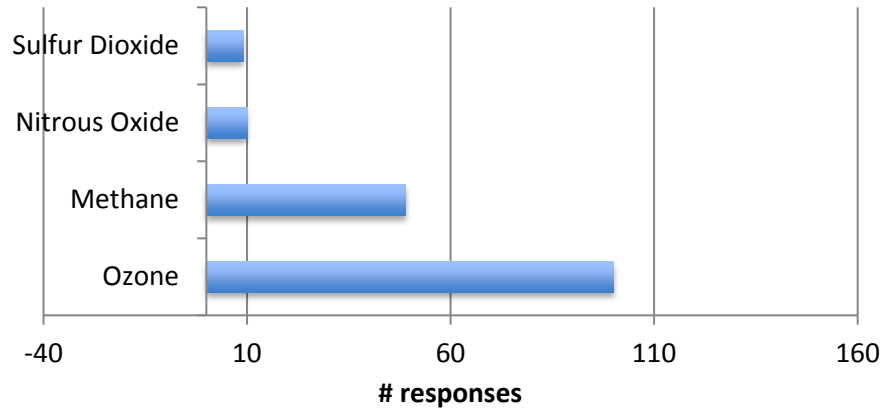
Q3: Some insecticides that were once effective in killing insects no longer work very well. This is because:



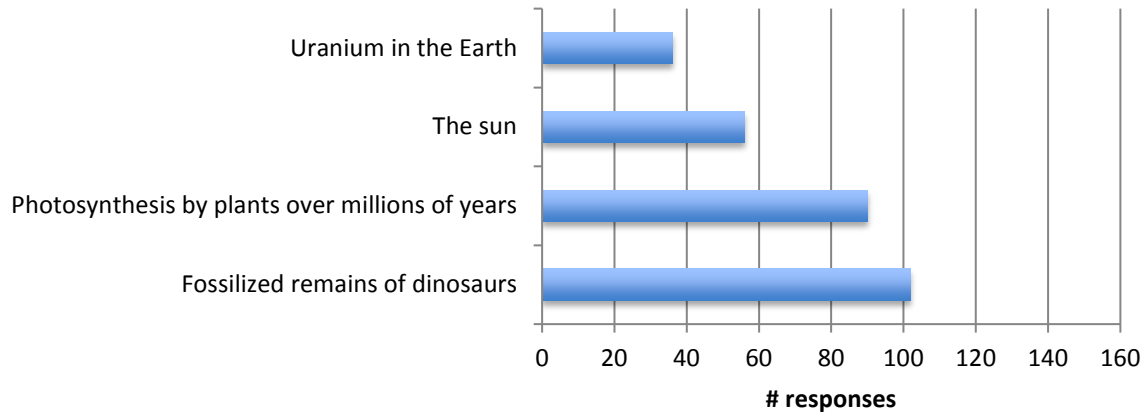
Q4: What is the primary benefit of wetlands? Do they:



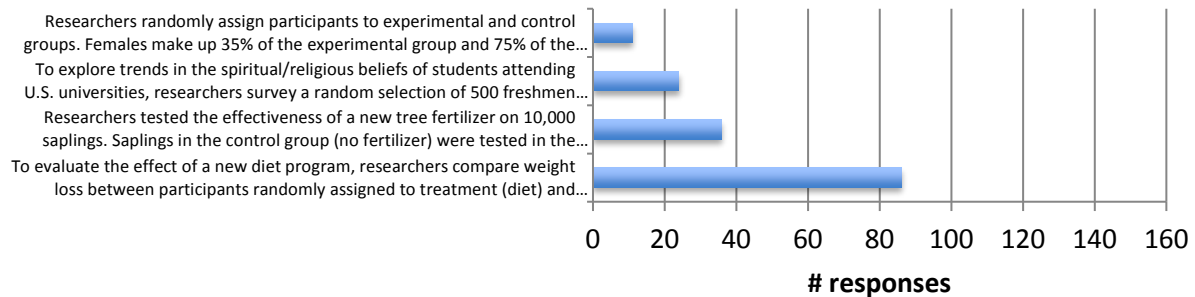
**Q5: Which of the following contributes to air pollution at the surface of the earth, and acts as a shield against ultraviolet rays in the upper atmosphere?**



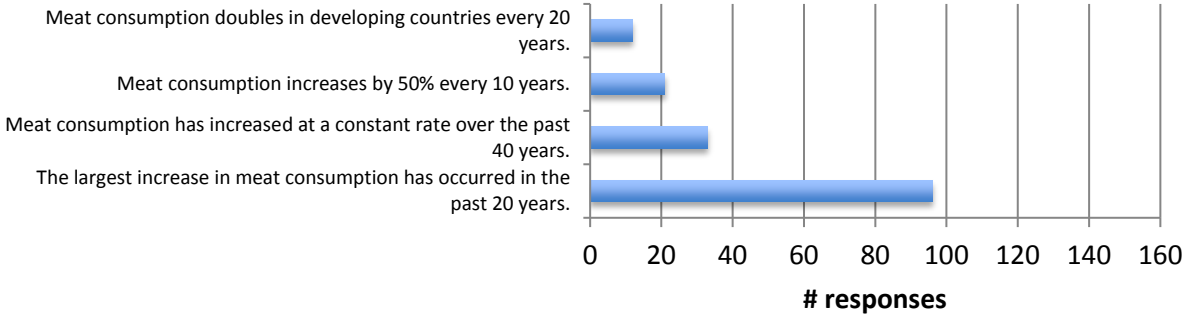
**Q6: The energy in fossil fuels originally came from: (Check all that apply)**



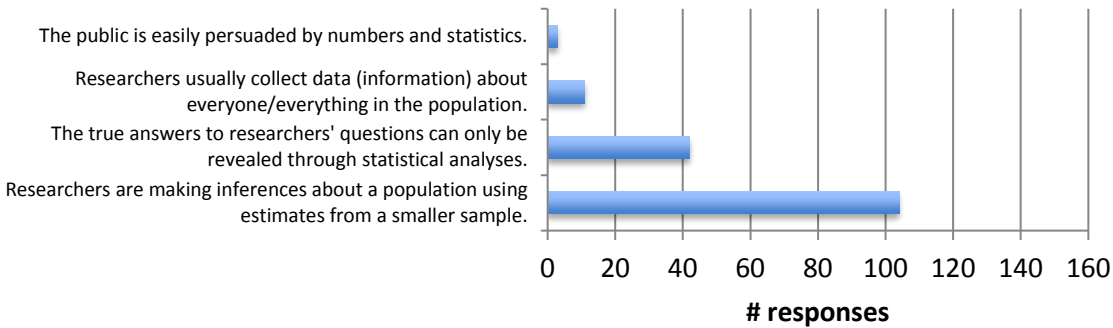
**Q8: Which of the following research studies is least likely to contain a confounding factor (variable that provides an alternative explanation for results) in its design?**



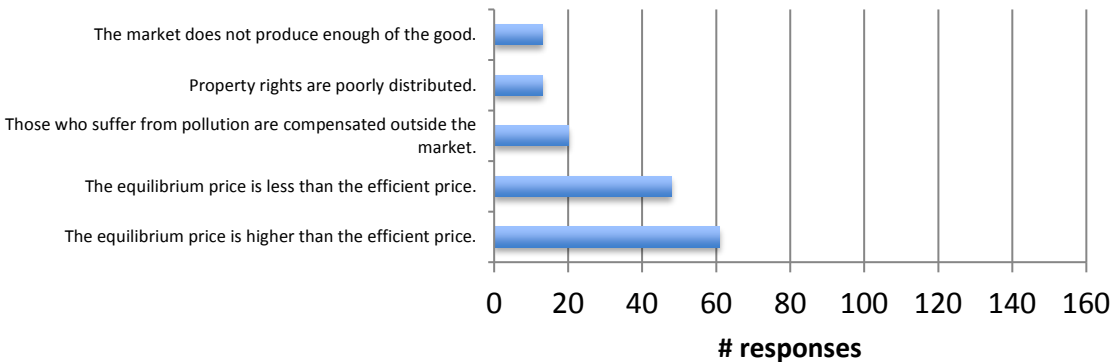
**Q9: Which of the following is the most accurate conclusion you can make from the data in this graph?**



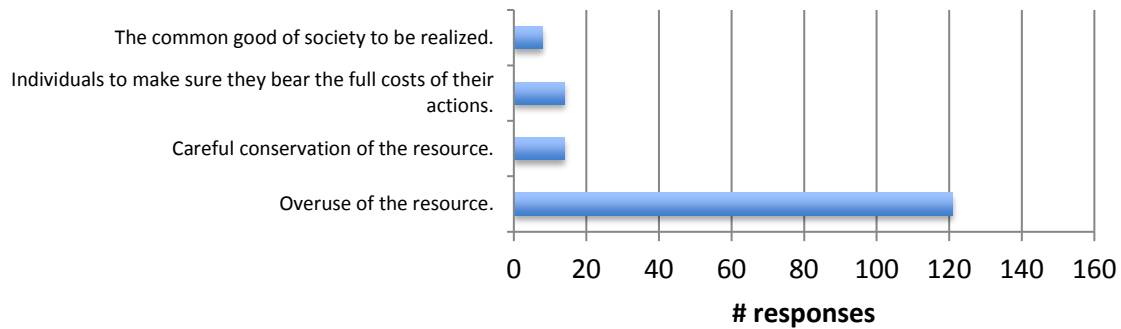
**Q10: Why do researchers use statistics to draw conclusions about their data?**



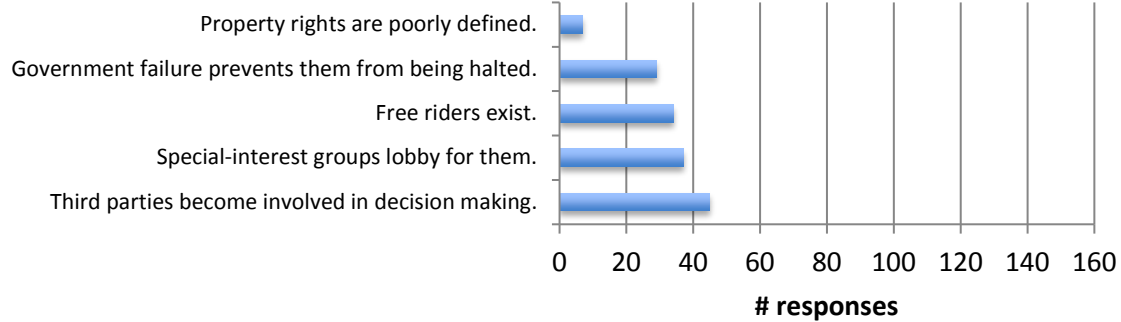
**Q12: Pollution is an example of a market failure because:**



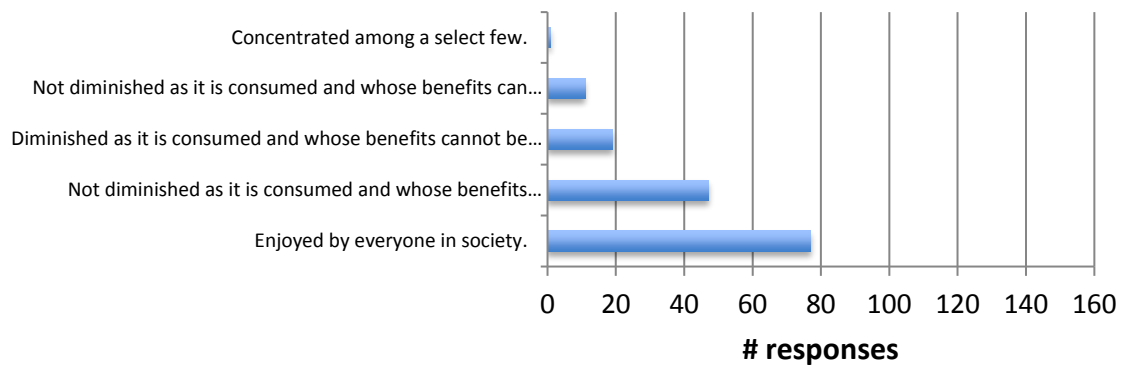
**Q13: The pursuit of self-interest in a "commons" where everyone has access to a valuable resource will cause:**



**Q14: The reason that so many economic activities create externalities is that:**



**Q15: A public good is a good whose benefits are:**





## **Appendix I. Survey, as appeared to students on Qualtrics Online Platform**

### Environmental Literacy and Awareness of DePaul Honors Program Students

Q1 Information Sheet for Participation in Research Study Environmental Literacy and Awareness of DePaul University Honors Program Students Principal Investigator: Olivia Johnson, Undergraduate, BS Environmental Science major Institution: DePaul University, USA Faculty Advisor: Jess Vogt, Assistant Professor, Environmental Science & Studies We are conducting a research study because we are trying to learn more about the environmental literacy and awareness of students in DePaul's Honors program. We are asking you to be in the research because you are enrolled in the Honors program. If you agree to be in this study, you will be asked complete an online survey. The survey will include questions about environmental knowledge, actions, and attitudes. We will also collect some personal information about you such as your gender, environment of your upbringing, political identity, religious identity, and some information about your coursework at DePaul. This survey will be conducted entirely online. If there is a question you do not want to answer, you may skip it. This study will take about 15-20 minutes of your time. Research data collected from you will be anonymous. Your participation is voluntary, which means you can choose not to participate. There will be no negative consequences if you decide not to participate or change your mind later after you begin the study. You can withdraw your participation at any time prior to submitting your survey. If you change your mind later while answering the survey, you may simply exit the survey. Once you submit your responses, we will be unable to remove your data later from the study because all data is anonymous and we will not know which data belongs to you. Your decision whether or not to participate in the research will not affect your grade in any coursework. You must be age 18 or older to be in this study. This study is not approved for the enrollment of people under the age of 18. If you have questions, concerns, or complaints about this study or you want to get additional information or provide input about this research, please contact Olivia Johnson (ojohns10@depaul.edu) or Dr. Jess Vogt (jvogt2@depaul.edu). If you have questions about your rights as a research subject, you may contact Susan Loess-Perez, DePaul University's Director of Research Compliance, in the Office of Research Services at 312-362-7593 or by email at sloesspe@depaul.edu. You may also contact DePaul's Office of Research Services if: Your questions, concerns, or complaints are not being answered by the research team. You cannot reach the research team. You want to talk to someone besides the research team. You may print this information for your records. By completing the survey you are indicating your agreement to be in the research.

Q2 Please answer the following questions to the best of your ability. If you do not know the answer to a question, please make your best educated guess.

Q3 Some insecticides that were once effective in killing insects no longer work very well. This is because:

- New insect species develop every day. (1)
- The wrong kind of insecticides were used. (2)
- Insects with natural resistance survived and multiplied. (3)
- The insects produced many more offspring than the insecticide could kill. (4)

Q4 What is the primary benefit of wetlands? Do they:

- Promote flooding. (1)
- Help clean the water before it enters lakes, streams, rivers, or oceans. (2)
- Help keep the number of undesirable plants and animals low. (3)
- Provide good sites for landfills. (4)

Q5 Which of the following contributes to air pollution at the surface of the earth, and acts as a shield against ultraviolet rays in the upper atmosphere?

- Nitrous Oxide (1)
- Methane (2)
- Ozone (3)
- Sulfur Dioxide (4)

Q6 The energy in fossil fuels originally came from: (Check all that apply)

- Fossilized remains of dinosaurs (1)
- Photosynthesis by plants over millions of years (2)
- The sun (3)
- Uranium in the Earth (4)

Q7 Please answer the following questions to the best of your ability. If you do not know the answer to a question, please make your best educated guess.

Q8 Which of the following research studies is least likely to contain a confounding factor (variable that provides an alternative explanation for results) in its design?

- Researchers randomly assign participants to experimental and control groups. Females make up 35% of the experimental group and 75% of the control group. (1)
- To explore trends in the spiritual/religious beliefs of students attending U.S. universities, researchers survey a random selection of 500 freshmen at a small private university in the South. (2)
- To evaluate the effect of a new diet program, researchers compare weight loss between participants randomly assigned to treatment (diet) and control (no diet) groups, while controlling for average daily exercise and pre-diet weight. (3)
- Researchers tested the effectiveness of a new tree fertilizer on 10,000 saplings. Saplings in the control group (no fertilizer) were tested in the fall, whereas the treatment group (fertilizer) were tested the following spring. (4)

Q9 Which of the following is the most accurate conclusion you can make from the data in this graph?

- The largest increase in meat consumption has occurred in the past 20 years. (1)
- Meat consumption has increased at a constant rate over the past 40 years. (2)
- Meat consumption doubles in developing countries every 20 years. (3)
- Meat consumption increases by 50% every 10 years. (4)

Q10 Why do researchers use statistics to draw conclusions about their data?

- Researchers usually collect data (information) about everyone/everything in the population. (1)
- The public is easily persuaded by numbers and statistics. (2)
- The true answers to researchers' questions can only be revealed through statistical analyses. (3)
- Researchers are making inferences about a population using estimates from a smaller sample. (4)

Q11 Please answer the following questions to the best of your ability. If you do not know the answer to a question, please make your best educated guess.

Q12 Pollution is an example of market failure because:

- The equilibrium price is higher than the efficient price. (1)
- The equilibrium price is less than the efficient price. (2)
- Property rights are poorly distributed. (3)
- The market does not produce enough of the good. (4)
- Those who suffer from pollution are compensated outside the market. (5)

Q13 The pursuit of self-interest in a “commons” where everyone has access to a valuable resource will cause:

- The common good of society to be realized. (1)
- Careful conservation of the resource. (2)
- Overuse of the resource. (3)
- Individuals to make sure they bear the full costs of their actions. (4)
- A reduction in pollution levels. (5)

Q14 The reason that so many economic activities create externalities is that:

- Free riders exist. (1)
- Third parties become involved in decision making. (2)
- Special-interest groups lobby for them. (3)
- Property rights are poorly defined. (4)
- Government failure prevents them from being halted. (5)

Q15 A public good is a good whose benefits are:

- Diminished as it is consumed and whose benefits cannot be withheld from anyone. (1)
- Not diminished as it is consumed and whose benefits cannot be withheld from anyone. (2)
- Not diminished as it is consumed and whose benefits can be withheld from anyone. (3)
- Concentrated among a select few. (4)
- Enjoyed by everyone in society. (5)

Q16 The following questions ask for your opinion. There are no correct or incorrect answers. If you do not feel comfortable answering a question, please feel free to skip to the next question.

Q17 Name one environmental topic you’ve encountered in the media in the last 5 days? \_\_\_\_\_

Q18 What was the source of this topic?

- Television (1)
- Newspaper (2)
- Book (print, or e-book) (3)
- Radio (4)
- Social media (5)
- Netflix (6)
- Other (7) \_\_\_\_\_

Q19 In one or a few sentences, briefly describe one environmental concern you expect to impact you or your lifestyle in the next 5 years: \_\_\_\_\_

Q20 The following questions ask for your opinion. There are no correct or incorrect answers. If you do not feel comfortable answering a question, please feel free to skip to the next question.

Q21 Chemicals are: (Check as many as you feel apply)

- good (1)
- bad (2)
- natural (3)
- man-made (4)
- problematic (5)
- over-used (6)
- under-used (7)

Q22 When I think of the environmental impact that my personal lifestyle has, I feel: (Check up to 5)

- worried (1)
- overwhelmed (2)
- awe-struck (3)
- informed (4)
- empowered (5)
- indifferent (6)
- powerless (7)
- happy (8)

Q23 When I think of the social impact that my personal lifestyle has, I feel: (Check up to 5)

- worried (1)
- overwhelmed (2)
- awe-struck (3)
- informed (4)
- empowered (5)
- indifferent (6)
- powerless (7)
- happy (8)

Q24 When I think of the economic impact that my personal lifestyle has, I feel: (Check up to 5)

- worried (1)
- overwhelmed (2)
- awe-struck (3)
- informed (4)
- empowered (5)
- indifferent (6)
- powerless (7)
- happy (8)

Q25 The following questions ask for your opinion. There are no correct or incorrect answers. If you do not feel comfortable answering a question, please feel free to skip to the next question.

Q26 Which of the following individuals and organizations do you see as having the most responsibility for or influence on environmental issues or problems? (Order from most influence/responsibility to least influence/responsibility)

- \_\_\_\_\_ Nonprofit organizations (1)
- \_\_\_\_\_ Business owners (2)
- \_\_\_\_\_ Business employees (3)
- \_\_\_\_\_ National government (4)
- \_\_\_\_\_ State government (5)
- \_\_\_\_\_ Local government (6)
- \_\_\_\_\_ Individual citizens (7)
- \_\_\_\_\_ Local community groups (8)

Q27 Imagine that you are standing in the produce section of the grocery store selecting fruit and vegetables for purchase. Order the following factors according to their influence on your purchasing decision:

- \_\_\_\_\_ Farmers (1)
- \_\_\_\_\_ Shelf-life (2)
- \_\_\_\_\_ Farm workers (3)
- \_\_\_\_\_ Ingredient for a recipe (4)
- \_\_\_\_\_ GMO-free (5)
- \_\_\_\_\_ Where the produce comes from (6)
- \_\_\_\_\_ Whether the produce is "in season" (7)
- \_\_\_\_\_ Price (8)
- \_\_\_\_\_ Pre-packaged or pre-sliced/prepared (9)
- \_\_\_\_\_ Organic (10)

Q28 You are shopping for clothes online. Order the following factors according to their influence on your purchasing decision:

\_\_\_\_\_ Shipping distance (1)

\_\_\_\_\_ Price (2)

\_\_\_\_\_ Brand (3)

\_\_\_\_\_ Fabric/material (what the clothes are made from) (4)

\_\_\_\_\_ Occasion (5)

\_\_\_\_\_ Where the product is made (6)

\_\_\_\_\_ Conditions of production (7)

Q29 For the following set of statements, please indicate whether you agree or disagree with the following statements. Be honest, there are no right or wrong answers.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
When I am outside, I usually don't notice the natural things around me like flowers, trees, and clouds. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm not interested in reading about nature or the environment. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like hearing the sound of animals such as birds and insects calling when I'm outside. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think most of the concern about environmental problems has been exaggerated. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental concerns influence my choices in a government election. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q30 For the following set of statements, please indicate whether you agree or disagree with the following statements. Be honest, there are no right or wrong answers.



	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Knowing about environmental problems and issues is important to me. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A community's pollution regulations should not interfere with industrial growth and development. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am concerned about the issue of deforestation. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More controls should be placed on industry and agriculture to protect the quality of the environment, even if it means that things that I purchase will cost more. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am not concerned about the fact that the world's deserts are increasing in size. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q31 For the following set of statements, please indicate whether you agree or disagree with the following statements. Be honest, there are no right or wrong answers.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
There are already enough laws to protect the environment. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would oppose any environmental regulations that would restrict my way of life. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental concerns influence my choices in the grocery store. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental restrictions should be lifted so that exploration and production of fossil fuels can be increased. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If a person's car exceeds certain standards for air pollution, he or she should not be allowed to drive it. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q32 For the following set of statements, please indicate whether you agree or disagree with the following statements. Be honest, there are no right or wrong answers.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
The government should provide financial support for research and development related to renewable energy, even if it means that taxes will be higher. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am concerned about how much waste is produced in this country. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Laws should be passed and enforced that protect the quality of life in the future even if it means that individual freedoms are limited. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am not concerned about the rate of species extinction in the world. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am concerned about environmental health hazards such as those caused by air or water pollution. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q33 For the following set of statements, please indicate whether you agree or disagree with the following statements. Be honest, there are no right or wrong answers.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
I want to help solve environmental problems. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental concerns influence my choices in the book store. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is not much that I can do that will help solve environmental problems. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that I can contribute to the solution of environmental issues by my actions. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Things that I do don't have much effect on the quality of the environment. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q34 For the following set of statements, please indicate whether you agree or disagree with the following statements. Be honest, there are no right or wrong answers.

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
I feel that it is my responsibility to help solve environmental problems. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I purchase one product over another product because it is packaged in reusable, returnable, or recyclable containers or packages. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I talk to my family and friends about what they can do to help solve environmental problems. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I make an effort to reduce the amount of goods I consume. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I turn off lights and appliances when they're not being used in order to conserve electricity. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental concerns influence my choices in the clothing store. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q35 This last set of questions ask you some basic demographic questions and a few questions about your course work at DePaul.

Q36 Please indicate your gender:

- Female (1)
- Male (2)
- Other (3) \_\_\_\_\_

Q37 Please indicate where you are in your schooling:

- Freshman (1)
- Sophomore (2)
- Junior (3)
- Senior (4)
- 5th year senior (5)
- Other (6) \_\_\_\_\_

Q38 Did you transfer to DePaul?

- Yes (1)
- No (2)

Q39 What degree with you receive when you graduate?

- Bachelor's of Science (B.S.) (1)
- Bachelor's of Arts (B.A.) (2)
- Bachelor's of Fine Arts (B.F.A.) (3)
- Other (4) \_\_\_\_\_

Q40 What is your major (and minor, or concentration, if applicable)? \_\_\_\_\_

Q41 What school or college are you in at DePaul? (You may select multiple if you are double-majoring in two colleges)

- Driehaus College of Business (1)
- College of Communication (2)
- College of Computing and Digital Media (3)
- College of Education (4)
- College of Liberal Arts and Social Sciences (5)
- College of Science and Health (6)
- School of Music (7)
- The Theater School (8)

Q42 What is your intended career path at present? \_\_\_\_\_

Q43 Which course in the Honors curriculum have you completed? (Check all that apply- check all that would appear "completed" or "in progress" on your degree progress report, including courses covered by previous credits or major coursework)

- HON 100 – Rhetoric and Critical Inquiry (1)
- HON 101 – World Literature (2)
- HON 102 – History in Global Contexts (3)
- HON 104 – Religious Worldviews and Ethical Perspectives (4)
- HON 105 – Philosophical Inquiry (5)
- HON 110/111 – Honors Explore/Discover Chicago (6)
- HON 180 – Data Analysis and Statistics (7)
- HON 201 – States, Markets, and Societies (8)
- HON 205 – Interdisciplinary Arts (9)
- HON 207 - Topics in Cognitive Studies (10)
- HON 225 - Honors Lab Science Topics (11)
- HON 300 – Honors Research Seminar (12)
- HON 301 – Honors Junior Seminar in Multiculturalism (13)
- HON 350 – Honors Senior Seminar (14)
- HON 351 – Honors Senior Seminar in Service Learning (15)
- HON 395 – Honors Senior Thesis (16)

Q44 Which best describes the place where you spent the majority of your upbringing and your time before college: (Pick one)

- Rural (1)
- Urban (2)
- Suburban (3)

Q45 Did you grow up in the United States?

- Yes (1)
- No (2)

Answer If Did you grow up in the United States? Yes Is Selected

Q45 Which state? [List of states here]

Answer If Did you grow up in the United States? No Is Selected

Q45 In which country do you grow up? [List of countries here]

Q46 Have you studied abroad?

- Yes. Where? (1) \_\_\_\_\_
- No (2)

Q47 Do you identify with a U.S. political party? If so, which party?

- Yes, I identify as a Democrat. (1)
- Yes, I identify as a Republican (2)
- Yes, I identify as a Libertarian (3)
- Yes, I identify with another political party: (4) \_\_\_\_\_
- No, I do not identify with a political party, or I identify as Independent. (5)

Q48 Do you identify with any particular religion? If so, which? \_\_\_\_\_

Q49 Please click the button below to submit your responses. All responses are anonymous.

Thank you for your participation in our survey!

#### Sources for Questions

Cengage Learning, Quiz on CHAPTER 14 EXTERNALITIES, MARKET FAILURE, AND PUBLIC CHOICE in Principles of Economics 3rd Edition (2002) accessed at [http://www.cengage.com/resource\\_uploads/downloads/1426648359\\_172072.pdf](http://www.cengage.com/resource_uploads/downloads/1426648359_172072.pdf)

**Q12, Q13, Q14, Q15**



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**Q8, Q9, Q10**

Leiserowitz, A., Smith, N. & Marlon, J.R. (2010) Americans' Knowledge of Climate Change. Yale University. New Haven, CT: Yale Project on Climate Change Communication.

**Q6**

Wisconsin Center for Environmental Education (1994) Wisconsin High School Environmental Survey

**Q3, Q4, Q5, Q29\_1-4, Q30\_1-5, Q31\_1-2, Q31\_4-5, Q32\_1-5, Q33\_1, Q33\_3-5, Q34\_1-5**

Original

**Q17, Q18, Q19, Q21, Q22, Q23, Q24, Q26, Q27, Q28, Q29\_5, Q31\_3, Q34\_6**