# University Students' Attitude to the Environment: An Australian/USA Comparison and the Effects of An Educational Program

## ABSTRACT

Significant differences were found between a pretest measurement of environmental attitudes of a sample of tertiary students from the USA and that of a similar sample of Australian students; the latter scored higher on the total scale used to measure attitudes, and on all but one of the subscales. After an educational program USA students showed significant increases in scores for the total scale and for all the subscales so that they scored significantly higher on two subscales than Australian students. Discussion of these changes in measured attitudes refers to the institutional processes of education, to changes in environmentalism and to notions of dependence on science and technology for the resolution of environmental issues.

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*"the Health of the Planet Survey...found that many people saw environmental problems as serious, as increasingly threatening to human well-being, and of personal concern to them"*

Coinciding with the 1992 Earth Summit in Rio the Gallup International Institute conducted the Health of the Planet Survey in 24 nations. Responses of environmental perceptions and opinion were collected from nearly 30,000 citizens around the world; the survey sample represented approximately 40 percent of the world's population and included both industrialised and developing countries. The survey found that many people saw environmental problems as serious, as increasingly threatening to human well-being, and of personal concern to them (Dunlap, Gallup & Gallup 1993). While specific problems of concern varied from country to country the results documented levels of awareness and concern which emphasised a more worldwide consensus that environmental concern had become a widespread phenomenon than had generally been assumed.

Using some of the same data from the Health of the Planet Survey Brechin and Kempton (1994) considered environmental concern—or environmentalism—to be a global phenomenon and suggested five possible explanations for apparent differences in environmental concern between poorer populations and more economically advantaged nations. These included:

* environmental justice and social protest.
* diffusion of environmental values via mass media.
* direct observation of environmental change and degradation.
* institutional processes.
* the possibility that environmentalism itself had changed having become a more materialistic value.

These will be discussed later in this paper; a focus of the discussion will be institutional processes as they relate to education.

The purpose of the research reported here was two-fold:

* to compare, by using the same attitude measurement scale, the environmental attitudes or worldviews of tertiary student samples from two industrialised countries, the USA and Australia, to determine what similarities and/or differences existed.
* to place an emphasis on the institutional effects of education in creating and changing attitudes toward the environment.

The present research used the Ecological Worldview Scale, previously employed by Blaikie (1992 & 1993) to measure the ecological attitudes of an Australian sample of university students and residents in Melbourne, to collect similar measurements from a sample of USA university

students. This research was based on an experimental study (Ridener 1995) which used pre-test and post-test measurements of ecological worldviews of USA students to compare with each other and with Blaikie's data.

## Method

Subjects involved in this study were a sample of students attending undergraduate sociology courses at a medium-sized state university with an approximate enrolment of 17,000 located in a large metropolitan area of the south-western United States of America. The total sample for the experiment consisted of 81 males (39.7%) and 123 females (60.3%), who were mostly first and second year students (63.1%) but included academic majors which cut across the colleges and/or schools of the university. Although both experimental and control groups were used in the original analysis (Ridener 1995), for the purposes of this paper only the experimental treatment data is analysed. The detailed description of the Australian sample (Blaikie 1992) indicated that a similar group of students were involved in that study.

The USA students investigated were three groups (N = 30, 91, and 47) taking Introductory Sociology, an undergraduate course. This course employed a construct-ivist education orientation (Klein and Merritt 1994, Jonassen 1991a & b, Berger & Luckman 1966) and included a substantial component related to environmental sociology (Buttel 1987) as an environmental education program with issues of concern focusing on *Ishmael* (Quinn 1992). The book uses a broad historical, philosophical, and cultural perspective to tell a 'story of captivity' of modern civilisation. The relationship between the course and constructivist approaches to teaching are set out in the box in the adjacent column.

An experimental research design involving pre-test and post-test measurements (Campbell & Stanley 1963) was used. An initial analysis of the pre-test measurements for the three groups revealed no significant differences between them. Results for the three groups were therefore combined for further data analysis.

On the first day of class a pre-test measurement of students' environmental attitudes was made via the Ecological Worldview Scale set out in the Appendix. Students were informed that they were participating in a research project, that the questionnaire was a preliminary measure of some social attitudes of importance to the study and that answers would be strictly confidential and seen only by the researcher. The post-test measurement was made during the last week of the semester at the completion of the environmental sociology/ environmental education component. The Ecological Worldview Scale was scored in the same manner as described by Blaikie (1992); responses available ranged from "strongly agree" to "strongly disagree" and were scored from 1 to 5 to give the highest score to an ecological worldview or a more pro-environmental stance. The Scale is divided into a series of subscales shown in the Appendix. For purposes of discussion

**Content of environmental education course**

Daniel Quinn's *Ishmael* was a required text in the environmental education course used in this study. Class discussions and an interpretive analysis of the book provided for students' active participation in the analysis of their worldview, a key component of the constructivist orientation (Berger & Luckmann 1966, Klein & Merritt 1994, Jonassen, 1991a & b, Clements & Battista 1990). Additional environmental education components including watching video presentations from the Public Broadcasting Service series "Race to Save the Planet".

In calling for environmental education to incorporate the philosophy of constructivism into curricula, Klein and Merritt (1994) emphasised four components which were incorporated into the research design used here: the introduction of real-life problems—environmental problems; student-centred instruction facilitated by the teacher—tutor-guided reading of *Ishmael*; productive group interaction during the learning process—class discussion of *Ishmael* and environmental problems; authentic assessment and demonstration of student progress—written paper interpreting *Ishmael* in relation to sociological concepts and individual experience. It has been suggested that as a social learning process a "constructivist classroom is seen as a culture in which students are involved...in a social discourse involving explanation, negotiation, sharing, and evaluation" (Clements & Battista 1990). *Ishmael* provided the basis for the implementation of a constructivist perspective in that students were involved in a social discourse and in their own explanation, negotiation, sharing and evaluation by writing an interpretive paper. Berger and Luckmann (1966) described three moments of a dialectical process in the social construction of reality as externalisation, objectivation and internalisation. Externalisation refers to individuals creating their social world. Environmental education can help students create a new social reality, or worldview, or it can maintain the ongoing processes of education by recreating ecological worldviews. Objectivation is the process in which individuals apprehend everyday life as an ordered and arranged reality which provides a sense of meaning for individuals. The language of *Ishmael* helped the student understand 'how we got to be this way'. Internalisation is a process involving primary and secondary socialisation. Primary socialisation is what takes place in childhood when "the child takes on the significant others' roles and attitudes...internalises them and makes them his (sic) own" (Berger & Luckmann 1966). This is what Quinn refers to as "Mother Culture". Secondary socialisation is "any subsequent process that inducts an already socialised individual into new sectors of the objective world" (Berger & Luckmann 1966). Secondary socialisation includes the acquisition of knowledge, and for my purposes here, the change in attitudes or ecological worldviews. *Ishmael* provided for the creation of a new social reality by critically analysing the status quo, the "dominant social paradigm" (Dunlap & Van Liere 1978 & 1984), or "Mother Culture" in Quinn's terms, and suggested a new orientation to the world, hence a difference in ecological worldviews.

here the terms 'pro-environmental', 'environmentalism' and 'environmentalisation' will be used as similar if not interchangeable terms which are related to the process of increasing positive attitudes toward the environment.

An important consideration in the design of a scale consisting of several subscales such as the Ecological Worldview Scale is the degree to which the subscales and the scale are internally consistent. The assessment of this by statistical means, for Blaikie's study and for this study, found satisfactory levels of internal consistency, details of which are available from the author.

In the original study (Ridener 1995) attitudes toward the environment of USA students were found to show significant increases after the experimental exposure to an environmental education component of a sociology course. The purpose of this paper is to compare the attitudes of USA students with those of a similar group of students in Australia using the same measurement of ecological worldviews. In order to assess similarities and/or differences between the USA and Australian samples the statistical procedure known as t-test was carried out comparing pre-test and post-test measurements of the USA student sample with the Australian student sample for each individual item, the seven subscales, and the total score as reported by Blaikie (1992). Only the subscale and total scale scores and the analysis of them are detailed below.

## Results

The analysis of the data for USA students showed significant differences between the experimental group, that is those who experienced the environmental education program, and a control group who did not experience the environmental education program and whose results are not shown in this paper. In the experimental analysis of USA student data the greatest differences were found in the pre-test-post-test comparisons (Ridener 1995). Since this finding was known, it was decided to compare these data with those of Blaikie (1992) using the Ecological Worldview Scale. There was very little evidence available regarding cross-cultural comparisons of respondents from similar countries, especially USA–Australian comparisons, using the same attitudinal measurements (Blaikie 1992 & 1993, Dunlap et al 1993, Ridener 1995).

*Pre-test Comparisons*

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*ꞌThe strongest difference between USA and Australian students on the subscales was for 'problems of economic growth' with Australian students scoring higher than USA students Ꞌ*

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Comparisons of the pre-test measurements of the USA sample with the Australian sample showed significant differences between the two groups. Australian students scored higher than the USA students on all but one of the seven subscales and on the total score. These results are presented in Table 1.

Table 1 — Comparison of USA and Australian student group means for pre-test measurements of USA students

| Subscale | U.S.A (N=168) | | Australian (N=390) | | Differences |
|---|---|---|---|---|---|
| | M | SD | M | SD | t |
| 1. USEENV | 3.44 | 0.9 | 3.67 | 0.9 | -2.77 ** |
| 2. PRECAR | 4.03 | 0.7 | 4.20 | 0.6 | -2.92 ** |
| 3. CONSENV | 3.94 | 0.8 | 4.14 | 0.8 | -2.70 ** |
| 4. SACENV | 4.03 | 0.7 | 4.26 | 0.7 | -3.55 *** |
| 5. CONFSCI | 2.75 | 0.7 | 2.91 | 0.8 | -2.24 * |
| 6. ECONGR | 2.95 | 0.7 | 3.21 | 0.8 | -3.64 *** |
| 7. CONSRES | 4.01 | 0.7 | 4.08 | 0.7 | -1.08 ns |
| 8. WORLD | 3.56 | 0.5 | 3.76 | 0.5 | -4.37 *** |

ns = not a significant difference.

Asterisks indicate results where significant differences were observed—p (the probability that the differences observed were due to chance only) is <.05 (*), <.01(**) & <.001 (***)

The single item with the greatest difference between the two groups was item 10 on the Scale (see Appendix). Australian students who scored a mean of 3.65 for this item were clearly more willing to decrease the use of automobiles to aid in pollution control than were USA students for whom the mean score was 3.05. This item showed by far the strongest statistical significance of any item, demonstrating the love affair with the automobile and its use which citizens of the USA 'enjoy.' This notion is in agreement with the differences between the USA and other countries in automobile uses and energy consumption as reported by Schipper (1995); Australian data was not reported in that study. Overall, Australian students (M= 3.76) had significantly higher scores on the Ecological Worldview Scale than USA students (M= 3.56) in the pre-test analysis.

The strongest difference between USA and Australian students on the subscales was for "problems of economic growth" (ECONGR) with Australian students (M = 3.21) scoring higher than USA students (M = 2.95). Since this subscale is reversed scored, the higher scores indicate that Australian students have less concern with economic issues—and more concern with environmental issues—than do USA students. This subscale deals with whether there are conflicts between the environment and the economy created by rapid economic growth, and whether future generations will develop a no-growth economy. A second subscale also showed significant differences between the groups on

somewhat similar issues. Australian students (M= 4.26) were more willing to "make sacrifices for the natural environment" (SACENV) than USA students (M= 4.03). This subscale has some economic overtones which may be linked with the ECONGR subscale.

The subscale "confidence in science and technology" (CONFSCI) also showed a significant difference between USA and Australian students although this was the smallest of the statistically significant difference shown on all the subscales. Again Australian students (M= 2.91) scored higher than USA students (M= 2.75). Because this scale is reverse scored higher scores indicate less confidence in science and technology. The subscale refers to respondents' belief in the ability of science and technology to raise humans' standard of living and to improve the ability of modern societies to solve their problems by applying more and better technology.

*Post-test comparison*

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The comparison of USA students' post-test scores with Blaikie's results for Australian students is set out in Table 2.

Table 2—Comparison of USA and Australian student group means for post-test measurements of USA students

| Subscale | U.S.A (N=168) | | Australian (N=390) | | Differences |
|---|---|---|---|---|---|
| | M | SD | M | SD | t |
| 1. USEENV | 3.88 | 0.9 | 3.67 | 0.9 | 2.53 ** |
| 2. PRECAR | 4.26 | 0.7 | 4.20 | 0.6 | 1.08 ns |
| 3. CONSENV | 4.14 | 0.8 | 4.14 | 0.8 | 0.00 ns |
| 4. SACENV | 4.35 | 0.6 | 4.26 | 0.7 | 1.46 ns |
| 5. CONFSCI | 2.93 | 0.8 | 2.91 | 0.8 | 0.27 ns |
| 6. ECONGR | 3.23 | 0.8 | 3.21 | 0.8 | 0.27 ns |
| 7. CONSRES | 4.33 | 0.6 | 4.08 | 0.7 | 4.06 *** |
| 8. WORLD | 3.84 | 0.6 | 3.76 | 0.5 | 1.63 ns |

ns = not a significant difference.

Asterisks indicate results where significant differences were observed—p (the probability that the differences observed were due to chance only) is <.05 (*), <.01(**) & <.001 (***)

Analysis of post-test results showed that differences between the student groups had changed. The t-test analyses revealed no significant differences between the students on most of the subscales and on the total scale, indicating more of a similarity of attitudes than in the pre-test comparison. This analysis also revealed that after the environmental educational experience the USA students scored significantly higher than the Australian students on two subscales.

The greatest difference was found on the 'conservation of natural resources' (CONSRES) subscale with USA students (M= 4.33) scoring higher than Australian students (M= 4.08). This subscale focused on government control of the use of raw materials so they would last longer, and on the requirement that industry recycle materials even though it might cost more. This difference indicated quite a substantial change for USA students from pre-test to post-test measurement. The second subscale which showed a significant difference was for the "use of the natural environment" (USEENV) with USA students (M= 3.88) scoring higher than Australian students (M= 3.67). This subscale dealt with the "human exemptionalism paradigm" (Dunlap & Van Liere 1978 & 1984) concerning the right of humans to modify the environment, human domination of nature, and the use of plants and animals by humans. Both of these subscales, particularly the idea of human exemptionalism, were extensively covered by the environmental education program (Ridener 1995) in which Quinn (1992) particularly challenged the human exemptionalism paradigm in his discussion of "Mother Culture".

This greater emphasis by USA students—on the conservation of resources and increased concern over the use of the environment solely for human purposes—seen in the post-test analysis was accompanied by a shift away from the primacy of the economy over the environment found for the USA students compared with the Australian students in the pre-test analysis. The importance of these findings for the purpose of his paper is not the increases that USA students' attitudes toward the environment showed (Ridener 1995), but that the differences between USA and Australian students in the pre-test comparison have now shifted to show a similarity of attitudes between USA and Australian students.

## Discussion

This research provides the basis of for a comparative analysis of ecological worldviews of two student samples from advanced industrial societies.

In the the pre-test comparison there were more differences than similarities found, with Australian students generally scoring higher than USA students. In the post-test measurement many of the initial differences disappeared and a greater similarity in environmental attitudes was found. The most immediate explanation for changes in the measured environmental attitudes of the USA students who were the subjects of this study can be found in the students'

experience of an environmental education program designed to produce attitude change (Ridener 1995), or what some research has referred to as an institutional factor (Brechin & Kempton 1994, Kanagy, Humphrey & Firebaugh 1994, Strang & Meyer 1993, Buttel 1992, Jones & Dunlap 1992, Olsen, Lodwick & Dunlap 1992) contributing to attitude change. The fact that USA students in the pre-test scored lower than Australian students was not surprising. In comparing attitudes internationally, Brechin and Kempton (1994) and Dunlap, Gallup and Gallup (1993) found that USA citizens scored lower than citizens of other countries on a variety of issues. The importance of these findings is in the potential for substantial change in attitudes by means of short, purpose-designed environmental awareness programs.

In examining different societies, the Health of the Planet Survey (Dunlap, Gallup & Gallup 1993) showed that among industrialised nations the USA ranked 8 out of 12 for those who thought that environmental problems were the "most important problem facing the nation" showing levels of concern below citizens in Ireland, Netherlands, Finland, Portugal, Switzerland, Denmark, and Japan, but with greater concern than citizens in Canada, Germany, Norway, and Great Britain respectively. USA measured levels of concern were also below those in the developing nations of Mexico, India, Chile and Turkey. Regarding the "seriousness of environmental issues in their own nations" the USA ranked fourth with Portugal and India. Reported levels of concern were lower than those for Germany, Switzerland and Canada, higher than those in Japan, Norway, Great Britain, Ireland, Netherlands, Denmark and Finland and lower than those of the developing nations of Korea, Poland, Mexico, Russia, Turkey and Chile. In response to "personal concern about the environment" reported levels of concern of the USA citizens were third among industrialised nations. They were lower than those of Portugal and Canada, higher than those in Great Britain, Norway, Ireland, Netherlands, Japan, Germany, Finland, Denmark and Switzerland and lower than those in the developing nations of Philippines and Nigeria. No data for these three questions on the Health of the Planet Survey were available for Australian citizens.

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Part of the differences in USA and Australian student's attitudes may be attributed to some of the environmental differences between the two countries. In recent years Australians have been greatly attuned to the augmented greenhouse effect, and to the depletion of the ozone layer over that portion of the world. An alarming rise in the frequency of skin cancers has further reinforced that awareness (Harper 1996, Cockerham 1995). On the other hand USA students are attuned to environmental concerns because of ever-increasing media attention and educational focuses on these issues (Harper 1996, Schnaiberg & Gould 1994). However, according to Armstrong and Impara (1991) and to Brothers, Fortner and Mayer (1991), for the same basic reasons—media attention and the distractions of other popular concerns highlighted by the media—USA students may not be attuned to these issues to the same degree as Australian students.

The specific subscales which showed significant differences between USA and Australian students provide some interesting relations to the postmaterialist thesis of Inglehart (1977 & 1990). This thesis is also sometimes referred to in part as postmodern (Ritzer 1996, Warren 1993, Olsen, Lodwick & Dunlap 1992); the terms are used interchangeably for the purposes of this paper. It holds that as industrial societies have grown they have produced greater wealth and economic security for large portions of their citizens. Because of this increased economic security, citizens of industrialised societies have been able to turn their interests to other 'quality of life' issues including increased environmentalism. While economic concern remains an important factor (Hamilton & Wright 1986) there has occurred a shift in values to include wider issues or interests (Inglehart 1990). In relation to the comparison of students' attitudes found here, for USA students compared to Australian students there was a shift away from a support for economic growth (ECONGR) to an increased concern for human use of the environment (USEENV). A theme related to the postmaterialist thesis is an underlying "political distrust" of all social institutions (Inglehart 1990) which can also be seen in the differences between the subscales. Of particular interest in regard to the findings here about USA and Australian students' attitudes was the "confidence in science" (CONFSCI) subscale. Science is described by Inglehart as one of several major social institutions in which there has been an increasing amount of "political distrust" or a lack of confidence (Inglehart 1990, Fox & Firebaugh 1992, Olsen, Lodwick & Dunlap 1992). In the pre-test comparison Australian students showed significantly less confidence in science than did USA students—a postmaterialist value. In the post-test comparison both USA and Australian students' attitudes were similar indicating that USA students were also now showing less confidence in science and technology's ability to improve the quality of life and solve society's problems. The findings related to both of these subscales provide some additional general support for Inglehart's thesis of a shift to postmaterialist values among citizens in industrialised societies. They also add the suggestion that such shifts in values may be aided through the experience of specific educational programs like the one described here.

## Conclusion

Changes in the significant differences between USA student attitudes and those of Australian students, from the pre-test to the post-test comparison for the USA students who participated in this survey, point to the positive effects of the educational program used in this study in increasing pro-environmental attitudes and, by extension, to suitably designed educational programs in general. In assessing the effects of the environmental education program it will be important to evaluate the content areas of emphases having the most significant influence in changing attitudes.

This paper is intended as a contribution to cross-cultural analysis in environmental education research; it is hoped that future environmental education research will extend our understanding of environmental attitudes and world-views not only in developed countries, such as USA and Australia, but also in developing countries. ⏎

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## Appendix : Ecological Worldview Scale

*These items were reversed scored to give the highest score to an ecological worldview (Blaikie 1992)

1. Humans have the right to modify the natural environment to suit their needs.

2. Priority should be given to developing alternatives to fossil and nuclear fuel as primary energy sources.*

3. Rapid economic growth often creates more problems than benefits.*

4. Human beings were created or evolved to dominate the rest of nature.

5. The balance of nature is delicate and easily upset.*

6. Through science and technology we can continue to raise our standard of living.

7. Humans must live in harmony with nature in order for it to survive.*

8. A community's standards for the control of pollution should not be so strict that they discourage industrial development.

9. Science and technology do as much harm as good.*

10. Because of problems with pollution, we need to decrease the use of the automobile as a major means of transportation. * (

11. Humans need not adapt to the natural environment because they can remake it to suit their needs.

12. Governments should control the rate at which raw materials are used, to ensure that they last as long as possible.*

13. The positive benefits of economic growth far outweigh any negative consequences.

14. We cannot keep counting on science and technology to solve our problems. *

15. People in developed societies are going to have to adopt a more conserving lifestyle in the future.*

16. Controls should be placed on industry to protect the environment from pollution, even if it means things will cost more.*

17. Most of the concern about environmental problems has been exaggerated.

18. The remaining forests in the world should be conserved at all costs.*

19. Most problems can be solved by applying more and better technology.

20. Industry should be required to use recycled materials even when it costs less to make the same products from new raw materials.*

21. When humans interfere with nature it often produces disastrous consequences. *

22. Plants and animals exist primarily for human use.

23. The government should give generous financial support to solar energy research .

24. To ensure a future for succeeding generation, we have to develop a no-growth economy.*

**Subscales**

Use/abuse of the natural environment (USEENV)— items 1, 4, 22

Precariousness of the natural environment (PRECAR)— items 5, 7, 11

Conservation of the natural environment (CONSENV)— items 18, 21

Sacrifices for the natural environment (SACENV)— items 15, 16

Confidence in science and technology (CONFSCI)— items 6, 14, 19

Problems of economic growth (ECONGR)— items 3, 24

Conservation of natural resources (CONSRES)— items 12, 20

Total Scale (WORLD)— all items

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