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Environmental Attitudes: 20 Years of Change?

LARRY M. GIGLIOTTI

ABSTRACT: Earth Day 1970 is considered by many to be the major starting point of the modern environmental era. Where are we today—two decades later? The environmental problems faced by society today will most likely require personal changes in lifestyles as part of their solution. A 1990 study was conducted to compare attitudes of Cornell University students with similar studies done in 1971 and 1981. This trends analysis focused on what students were willing to give up by measuring changes in attitudes toward 35 specific items. In addition, a New Environmental Paradigm growth and technology scale was used to test the hypothesis that people who see benefits of economic growth or have faith in technological solutions are less willing to make personal sacrifices.

Many have suggested that the roots of environmental problems stem, in large part, from the basic values upon which society has been built (Swan, 1971), such as individualism, materialism, limited government, progress, and growth (Caldwell, 1970; Christensen & Norgard, 1976; Harblin, 1977; Whisenhunt, 1974). These values may have seemed appropriate in a period of extraordinary abundance (i.e., low population level), given the lack of sound ecological knowledge at the time, but could prove disastrous for society as the human population reaches the ecological limits of the Earth (Gigliotti, 1990). Some researchers already believe that these limits have been reached. Meadows, Meadows, and Randers (1992), for example, concluded that human use of essential resources has already surpassed sustainable rates.

Human activities can have substantial impacts on the physical environment that provides for life (Jacobson & Price, 1991). As Browne (1991, p. 91) wrote, "I cannot

imagine even a nuclear war as destructive to wildlife as the effects of unchecked human reproduction." He stated that humanity is mindlessly waging war against other living things in the name of "living space" and "it is a war in which victory will impoverish all of us beyond belief."

Jacobson and Price (1991) list applications of science and technology as the major driving force behind the increasing effects of human actions on the global environment. Since 1950, while the world's population has doubled, the energy use has quadrupled, vastly improving material conditions of life for many (Jacobson & Price, 1991). However, economic growth has not been uniform throughout the world. The high level of consumption by rich countries and their great disparities with poor countries cannot continue much longer. With the continuing rise in both the population and the desires of the "haves-nots," there just will not be enough resources to meet the demands. "The capacity of the global life-support system to sustain a technologically advanced and exponentially expanding civilization is likely to collapse within the foreseeable future" (Malone & Corell, 1989, p. 7).

In discussing environmental protection for the future, Russell (1987) stated that the targets of efforts to improve the environment must change. He said that the impor-

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tance of changing the behavior of a few industrial polluters will decline, to be replaced by the need to alter the lifestyles of private citizens. He pointed out that pollution from industry is well regulated. For the future, much of the remaining pollution that will cause the greatest risk will be from widely dispersed sources, the control of which will depend on changing the behavior of individual citizens. Thus, it has been suggested that the traditional world view must be replaced by a more ecologically oriented paradigm (Dunlap & Van Liere, 1984).

The human activities that interact with Earth's natural systems are driven by three fundamental factors: the number of human beings and their distribution around the globe; human needs and desires, which provide individuals and societies with motivations to act; and the cultural, social, economic, and political structures that shape and mediate their behavior (Jacobson & Price, 1991). This study focused on the second factor: human needs and desires for material goods and individuals' willingness to make personal sacrifices.

The Study

Earth Day 1970 is considered by many to be the major starting point of the modern environmental era. Two decades later, the environmental problems faced by society will most likely require personal changes in lifestyles as part of their solution. Are today's youth willing to make personal sacrifices? Do people have the values and beliefs necessary to address the realities of the environmental problems in the 1990s or is there continued faith that the "experts" will find the correct technological solutions to resource shortages and pollution? Is a clean, functioning environment with a high species diversity more important to today's youth than the desire for material goods?

In 1990, I conducted a study to compare attitudes of Cornell University students with similar studies done in 1971 and 1981 (Thompson & Gasteiger, 1985). This trends analysis focused on what students were willing to give up by measuring changes in attitudes toward 35 specific items in five major categories (foodstuffs, household items, transportation, personal items, and recrea-

tion). The 1990 study included additional measures. Elements were selected from a modification of the New Environmental Paradigm scale developed by Kuhn and Jackson (1989), which focuses on items related to the negative consequences of growth and technology. I chose this factor to test the hypothesis that people who see the benefits of economic growth or have faith in technological solutions are less willing to make personal sacrifices.

Methods

A 12-page, self-administered, mail-back questionnaire was sent to 1,500 randomly selected Cornell University undergraduate students on October 22, 1990. The students were selected from the 1990 fall semester register. A reminder postcard was sent on October 31, a second mailing of the questionnaire was sent to nonrespondents on November 13, a third mailing of the questionnaire was sent to nonrespondents on December 5, and a final reminder letter was sent on December 12.

Results

Response Rates

The 1971 and 1981 surveys used a single mailing and received a 56% and a 45% response rate, respectively. The 1990 survey received a 70% response rate using multiple mailings, as recommended by Dillman (1978). To determine if differences between the first two surveys and the 1990 survey could be attributed to the difference in response rates, I divided the 1990 response into early, middle, and late responders (Table 1). Mean scores on willingness-to-give-up measures were analyzed using one-way analysis of variance with the return category as the independent variable (SPSS, 1986). Only 6 of the 35 items were significantly related to response time (Table 2). Early responders were slightly more willing to give up formal dress, current fashion, television, prewrapping of fresh foods, and perfumes and aftershaves and were slightly less willing to give up hiking than were late responders. Because these few differences were small, differential response rates were assumed to be a very minor

TABLE 1.—Questionnaire Returns for the Survey of Environmental Attitudes of Cornell Undergraduate Students, 1990

Return category	Number	% of total returns	Cumulative return rate (%)	Working days ^a
Early	501	49.2	34.2	10
Medium	255	25.1	51.7	11
Late	262	25.7	69.6	33

^aMondays through Fridays, excluding holidays.

TABLE 2.—Mean Willingness-To-Give-Up Scores Significantly Related to Return Category ($p \leq .01$)

Item ANOVA F value (df); p	Return category	Mean willingness to give up ^a	95% confidence interval
Formal dress $F(2) = 6.04; p \leq .01$	Early	3.5	3.4–3.6
	Middle	3.4	3.2–3.6
	Late	3.2	3.0–3.3
Current fashion $F(2) = 5.71; p \leq .01$	Early	3.6	3.5–3.8
	Middle	3.5	3.3–3.6
	Late	3.3	3.2–3.5
Television $F(2) = 4.81; p \leq .01$	Early	3.4	3.2–3.5
	Middle	3.1	3.0–3.3
	Late	3.1	2.9–3.2
Prewrapping of fresh foods $F(2) = 4.49; p = .01$	Early	3.6	3.5–3.7
	Middle	3.4	3.3–3.6
	Late	3.3	3.1–3.4
Hiking $F(2) = 4.47; p = .01$	Early	2.6	2.4–2.7
	Middle	2.8	2.5–2.9
	Late	2.9	2.7–3.1
Perfumes and aftershaves $F(2) = 4.31; p = .01$	Early	3.9	3.8–4.0
	Middle	3.8	3.6–3.9
	Late	3.6	3.4–3.8

^aOn a scale ranging from 1 (least willing) to 5 (most willing).

problem, if any, in the comparisons of these three survey groups.

Trends Analysis

I calculated an overall willingness-to-give-up score by taking the mean of all 35 items. The 1981 and 1990 samples of students were similar, with both groups less willing to give up items for the benefit of the environment than were the students in the 1971 sample (Table 3). Students were significantly more willing in 1990 than in 1981 to give up 12 items and significantly less willing to give up 15 items, although 8 items were statistically similar (Tables 4 and 5). Many of the significant differences between 1990 and 1981 were relatively small, ranging from 2.0% to 13.8% difference (Table 5).

In contrast, the 1971 students were much more willing to make personal sacrifices to address environmental problems (Tables 3 and 4). Students were significantly more willing in 1990 than in 1971 to give up 6 items and significantly less willing to give up 21 items, whereas 8 items were significantly similar (Tables 4 and 6). Many of the significant differences between 1990 and 1971 were generally larger than the 10-year differences (1981–1991), with more differences greater than 10% and a maximum difference of 26.3% (Table 6).

Two additional trends measured were belief in limited resources and student's political orientation. The belief that material and energy resources in the United States are seriously limited has significantly decreased from 1971 to 1981 and again from 1981 to 1990 (Table 7). Stu-

dents in 1981 and 1990 reported themselves as more conservative than 1971 students (Table 8).

New Environmental Paradigm—Growth and Technology

In this study, I used 11 items from a 22-item environmental attitude scale developed by Kuhn and Jackson (1989) that reflects attitudes toward growth and technology (Table 9). A growth and technology attitude scale (referred to as the NEP growth and technology scale) was produced by summing these 11 items (Table 10). A low score reflects an attitude that growth is good and science and technology can solve our problems, whereas a high score reflects concern about environmental problems caused by growth and development and a belief that environmental problems can best be solved by human restraint. The distribution of scores is slightly skewed toward the high end of the scale, with a mean of 30.8 (on a scale of 11 to 44). The NEP growth and technology scale was also divided into three levels (low, medium, and high) (Table 10).

Pearson product-moment correlations between willingness-to-give-up scores and NEP growth and technology scores showed 28 significant correlations (2 negative) using the $p < .01$ level of significance (Table 11). Mean scores on willingness-to-give-up measures were analyzed using one-way analysis of variance, with NEP growth and technology level as the independent variable (SPSS, 1989). Statistical comparisons used the $p < .01$ level of significance; 29 significant relationships were found

TABLE 3.—Overall Willingness-To-Give-Up (GIVEUP) Scores for 1971, 1981, and 1990 Cornell Students

	1971	1981	1990
Mean GIVEUP score ^a	3.09	2.97	2.94
95% confidence interval ($F = 55.72$; $df = 2/4596$; $p < .001$)	3.07–3.11	2.95–2.99	2.91–2.97

^aOn a 5-point scale from 1 (*least willing*) to 5 (*most willing*).

TABLE 4.—Mean Willingness-To-Give-Up Responses From 1990, 1981, and 1971 Surveys of Cornell Students

Items ^a	1990 mean ^b	1981 mean ^b	1971 mean ^b
Soap	1.379	1.301 ^c	1.328
Telephone	1.447	1.546 ^d	1.717 ^d
Oven in home	1.715	1.536 ^c	1.500 ^c
Milk	1.736	1.695	1.645
Home freezer	1.819	1.911	2.311 ^d
Automobile	1.880	1.923	2.036 ^d
Stereo sound system	2.107	2.253 ^d	2.371 ^d
Watches	2.193	2.448 ^d	2.503 ^d
Air travel (conventional)	2.289	2.563 ^d	2.700 ^d
Deodorants	2.324	2.515 ^d	2.805 ^d
City transit systems	2.485	2.139 ^c	2.385
Movies	2.503	2.751 ^d	2.773 ^d
Bicycle	2.606	2.135 ^c	2.613
Hiking	2.692	2.332 ^c	2.096 ^c
Live musical performance	2.727	2.566 ^c	2.722
Clothes dryer	2.902	3.089 ^d	3.366 ^d
Skiing	3.168	3.089	3.242
Television	3.217	3.598 ^d	3.563 ^d
Railroad travel (passenger)	3.225	2.933 ^c	3.405 ^d
Home air conditioning	3.270	3.823 ^d	3.825 ^d
Long distance buses	3.275	2.874 ^c	3.337
Frozen foods	3.278	3.154 ^c	2.935 ^c
Beef steaks	3.282	2.769 ^c	2.232 ^c
Coffee and tea	3.352	3.349	3.420
Formal dress	3.406	3.335	4.286 ^d
Prewrapping of fresh foods	3.453	3.265 ^c	3.238 ^c
Current fashion	3.505	3.782 ^d	4.072 ^d
Instant foods (mixes and dehydrated)	3.619	3.857 ^d	3.835 ^d
Canned soft drinks	3.647	4.153 ^d	4.253 ^d
Jewelry	3.695	3.726	4.234 ^d
Perfume and aftershave	3.793	3.998 ^d	4.199 ^d
Supersonic jet travel	4.081	4.418 ^d	4.481 ^d
Home garbage disposal	4.227	4.559 ^d	4.404 ^d
Country club	4.257	4.258	4.492 ^d
Motorcycle	4.454	4.332 ^c	4.045 ^c

^aItems arranged from *least willing* to *most willing* to give up in 1990. ^bOn a scale from 1 (*least willing*) to 5 (*most willing*). ^c1990 sample significantly more willing to give up at the .01 alpha level.

^d1990 sample significantly less willing to give up at the .01 alpha level.

TABLE 5.—Significant Mean Differences in Willingness-To-Give-Up Scale Between the 1990 and the 1981 Surveys of Cornell Students

Item ^a	Mean positive difference	Percentage difference
<i>Significantly more willing to give up in 1990 than in 1981 (12 items)</i>		
Soap	0.078	2.0
Motorcycle	0.122	3.1
Frozen foods	0.124	3.1
Live musical performance	0.161	4.0
Oven in home	0.179	4.5
Prewrapping of fresh foods	0.188	4.7
Railroad travel (passenger)	0.292	7.3
City transit system	0.346	8.7
Hiking	0.360	9.0
Long distance buses	0.401	10.0
Bicycle	0.471	11.2
Beef steaks	0.513	12.8
Total	3.235	
<i>Significantly less willing to give up in 1990 than in 1981 (15 items)</i>		
Telephone	0.099	2.5
Stereo sound system	0.146	3.7
Clothes dryer	0.187	4.7
Deodorants	0.191	4.8
Perfume and aftershave	0.205	5.1
Instant foods	0.238	6.0
Movies	0.248	6.2
Watches	0.255	6.4
Air travel (conventional)	0.274	6.9
Current fashion	0.277	6.9
Home garbage disposal	0.332	8.3
Supersonic jet travel	0.337	8.4
Television	0.381	9.5
Canned soft drinks	0.506	12.7
Home air conditioning	0.553	13.8
Total	4.229	

^aArranged from least to greatest difference.

(Table 11). Twenty-eight of the 35 willingness-to-give-up items were significant for both tests, indicating a strong relationship between personal sacrifice and a concern about environmental problems caused by growth and development along with low faith in technological solution. The two negative relationships seem consistent with this conclusion because hiking and biking are generally associated with environmentalists or outdoors-oriented people.

NEP Growth and Technology, Personal Sacrifice, Beliefs, and Political Orientation

The NEP growth and technology scale was the best predictor of willingness-to-give-up items in a multiple-

stepwise regression, with personal sacrifice as the dependent variable (adjusted $R^2 = 0.133$). The belief in limited resources was only slightly significant as the second variable added in the stepwise regression, increasing the adjusted R^2 to 0.137. Political orientation was not significant in the stepwise regression. The belief of limited materials and energy resources appears to be incorporated in the NEP growth and technology scale. A correlation matrix shows the relationship among these four variables (Table 12). The NEP growth and technology scale is strongly related to political orientation, but political orientation is not as strongly related to personal sacrifice.

TABLE 6.—Significant Mean Differences in Willingness-To-Give-Up Scale Between the 1990 and the 1971 Surveys of Cornell Students

Item ^a	Mean positive difference	Percentage difference
<i>Significantly more willing to give up in 1990 than in 1971 (6 items)</i>		
Oven in home	0.215	5.4
Prewrapping of fresh foods	0.215	5.4
Frozen foods	0.343	8.6
Motorcycle	0.409	10.2
Hiking	0.596	14.9
Beef steaks	1.050	26.3
Total	2.828	
<i>Significantly less willing to give up in 1990 than in 1971 (21 items)</i>		
Automobile	0.156	3.9
Home garbage disposal	0.177	4.4
Railroad travel (passenger)	0.180	4.5
Instant foods	0.216	5.4
Country club	0.235	5.9
Stereo sound system	0.264	6.6
Movies	0.270	6.8
Telephone	0.270	6.8
Watches	0.310	7.8
Television	0.346	8.7
Supersonic jet travel	0.400	10.0
Perfume and aftershave	0.406	10.2
Air travel (conventional)	0.411	10.3
Clothes dryer	0.464	11.6
Deodorants	0.481	12.0
Home freezer	0.492	12.3
Jewelry	0.539	13.5
Home air conditioning	0.555	13.9
Current fashion	0.567	14.2
Canned soft drinks	0.606	15.2
Formal dress	0.880	22.0
Total	8.225	

^aArranged from least to greatest difference.

TABLE 7.—Belief Among 1971, 1981, and 1990 Cornell Students That U.S. Material and Energy Resources Are Seriously Limited

	1971	1981	1990
Mean belief ^a	4.1	3.9	3.6
95% confidence interval	4.1–4.2	3.9–4.0	3.6–3.7
<i>F(2) = 70.82, p < .001</i>			

^aOn a 5-point scale ranging from *strongly disagree* (1) to *neither agree nor disagree* (3) to *strongly agree* (5).

TABLE 8.—Political Orientation of 1971, 1981, and 1990 Cornell Students

	1971	1981	1990
Political orientation ^a	3.27	3.87	3.91
95% confidence interval	3.22-3.33	3.81-3.93	3.83-3.99
<i>F(2, 4344) = 130.70, p < .001</i>			

^aOn a 7-point scale ranging from 1 = *very radical* (far left) to 7 = *very conservative* (far right).

TABLE 9.—Reliability of Items in the New Environmental Paradigm Growth and Technology Scale

Growth and technology item	Alpha if item deleted
Science and technology often do as much harm as good	.76
When humans interfere with nature, it often produces disastrous consequences	.76
More emphasis should be placed on teaching children about nature than on teaching them about science and technology	.76
We cannot keep counting on science and technology to solve our problems	.76
Humans must live in harmony with nature in order to survive	.78
Rapid economic growth often produces more problems than benefits	.76
Humans are severely abusing the environment	.77
U.S. citizens are going to have to reduce their consumption of material goods over the next few years	.76
In general, U.S. citizens would be better off if the nation's economy stopped growing	.77
The positive benefits of economic growth far outweigh any consequences	.78
Most problems can be solved by applying more and better technology	.77

Note. Cronbach's alpha = 0.78; number of cases = 967.

Discussion and Implications

Measuring Environmental Attitudes

This research began with the premise that solving today's environmental problems will require changes in personal lifestyles as part of the solution. However, if students today are more materialistic (as measured by willingness-to-give-up items) than students 20 years ago, the implication for environmental education is that the environmental message must change to stress the link between today's lifestyles and environmental problems.

A number of researchers have provided evidence that a social transformation is occurring in the direction of a New Environmental Paradigm (Catton & Dunlap, 1978; Dunlap, 1980; Dunlap & Van Liere, 1978; Geller & Las-

ley, 1985; Shetzer, Stackman, & Moore, 1991; Yankelovich & Lefkowitz, 1980). Whereas Thompson and Gasteiger (1985) have suggested that a move away from environmental concerns in favor of materialism had occurred in the 1970s, Shetzer, Stackman, and Moore (1991) have proposed that a strong proenvironmental sentiment is currently emerging among business students. However, this study, which extends Thompson and Gasteiger's work by another 10 years, suggests little change in environmental concern during the 1980s. This apparent contradiction might be explained by examining the focus of the studies and how "environmental concern" was measured. Many of the studies suggesting an increase in environmental concern used some measure of the importance of environmental issues without involving tradeoffs,

TABLE 10.—Frequency Distribution of Cornell Undergraduate Students on the New Environmental Paradigm Growth and Technology Scale (NEP), 1991

NEP score	Number	Percentage
<i>Low NEP level; n = 247 (25.5%)</i>		
11	2	0.2
12	0	0.0
13	0	0.0
14	0	0.0
15	4	0.4
16	1	0.1
17	2	0.2
18	1	0.1
19	5	0.5
20	7	0.7
21	8	0.8
22	15	1.6
23	19	2.0
24	35	3.6
25	41	4.2
26	52	5.4
27	55	5.6
<i>Medium NEP level; n = 497 (51.4%)</i>		
28	64	6.6
29	62	6.4
30	66	6.8
31	80	8.3
32	73	7.5
33	94	9.7
34	58	6.0
<i>High NEP level; n = 223 (23.1%)</i>		
35	51	5.3
36	44	4.6
37	32	3.3
38	34	3.5
39	26	2.7
40	15	1.6
41	12	1.2
42	5	0.5
43	2	0.2
44	2	0.2
Total (Mean = 30.8)	967	100.0

whereas Thompson and Gasteiger (1985) and this study measured willingness to make personal sacrifices to help solve environmental problems.

Thus, to date, environmental education seems to have succeeded largely in increasing concern about the environment and about pollution problems caused by industry, while the message of the individual's role in environmental problems is just beginning to be sounded. It is not surprising, then, that today's students are not necessarily ready to make personal sacrifices.

The concept that resources are limited has long been an important message of environmental educators. However, fewer of today's students believe that resources are limited compared to students of 20 years ago. It seems that when economies slow down, fingers point in every direction (particularly at government)—except at the possibility that people and their desires for the "good life" are beginning to run up against the biological limits of the environment to meet their demands.

Thus, environmental education messages seem to have failed to emphasize the connection between limited resources and what that fact will mean to the individual. What evidence should people be looking for that would demonstrate that limited resources are beginning to affect personal lifestyles? As an example, Catton and Dunlap (1980, p. 29) have pointed out that "the rate of increase in food production and the discovery of natural resources (especially fossil fuels) has declined significantly in recent years" and that "economic growth has begun to slow, not only among the industrial nations but throughout most of the world" as evidence that limited resources are already affecting lifestyles.

The need for environmental education appears to be greater today than ever before, particularly considering the need to address personal behaviors. Milbrath, Hausbeck, and Enright (1990, p. 9) concluded from their 1990 study of New York State 11th graders that, "students are fairly highly aware of and concerned about environmental problems, but have weak substantive knowledge about how environments work, how societal and personal actions impact the environment, and how environmental problems impact society." According to Barry (1990, p. 62), "the great majority of adverse actions come not from malice toward the environment, but from a lack of knowledge of proper methods to prevent non-point source and point source pollution." Perhaps educators should do away with the point/nonpoint source terminology and consider that, because of each individual's needs, desires, and actions, resource use and its resulting pollution occur whether it originates directly from the individual or from a factory that supplies the individual's needs and desires.

An important message that must first be believed, then, is that resources are limited. In this study, a belief that material and energy resources are limited was related to a willingness to make personal sacrifices. For people to truly understand this message, the connection must be made between limited resources and the effect these limitations will have on people and their lifestyles. Thus, the new environmental message must stress the connection between lifestyle and many of today's environmental problems before people will be ready to make personal changes. To achieve results, educators will need as vigorous an effort as was used during the antilittering campaign of the 1970s and the recycling campaign of the 1980s.

TABLE 11.—Pearson Product-Moment Correlations for Willingness-To-Give-Up Scores With New Environmental Paradigm Growth and Technology Scores (NEP) and Mean Willingness-To-Give-Up Scores Related to NEP Level

Item	Pearson correlation	Significance	Mean willingness to give up ^a by NEP			<i>F</i>	Significance
			Low	Medium	High		
Television	.323	≤ .05	2.6	3.2	3.8	47.17	< .001
Automobile	.303	≤ .05	1.5	1.8	2.5	47.69	< .001
Beef steaks	.296	≤ .05	2.7	3.4	3.7	31.13	< .001
Country club	.291	≤ .05	3.8	4.3	4.6	32.55	< .001
Perfumes and aftershave	.259	≤ .05	3.4	3.8	4.2	27.74	< .001
Canned soft drinks	.257	≤ .05	3.2	3.7	4.0	21.97	< .001
Supersonic jet travel	.250	≤ .05	3.7	4.1	4.4	22.39	< .001
Clothes dryer	.246	≤ .05	2.5	2.9	3.4	32.39	< .001
Prewrapping of fresh foods	.246	≤ .05	3.1	3.5	3.8	20.72	< .001
Home air conditioning	.233	≤ .05	2.9	3.2	3.8	27.07	< .001
Current fashion	.230	≤ .05	3.2	3.5	3.9	21.68	< .001
Formal dress	.227	≤ .05	3.0	3.4	3.8	21.13	< .001
Frozen foods	.225	≤ .05	2.8	3.4	3.5	27.80	< .001
Deodorants	.201	≤ .05	1.9	2.3	2.7	21.30	< .001
Instant foods	.197	≤ .05	3.3	3.7	3.9	15.98	< .001
Hiking	-.195	≤ .05	2.9	2.8	2.2	18.06	< .001
Home freezer	.190	≤ .05	1.6	1.8	2.1	12.68	< .001
Air travel (conventional)	.187	≤ .05	2.1	2.2	2.7	16.04	< .001
Bicycle	-.168	≤ .05	2.8	2.7	2.1	16.28	< .001
Motorcycle	.161	≤ .05	4.2	4.5	4.6	9.79	< .001
Telephone	.158	≤ .05	1.3	1.4	1.7	16.55	< .001
Skiing	.141	≤ .05	2.9	3.2	3.3	7.30	.001
Movies	.126	≤ .05	2.3	2.5	2.7	6.11	.002
Home garbage disposal	.118	≤ .05	4.0	4.2	4.4	6.67	.001
Jewelry	.114	≤ .05	3.5	3.7	3.9	5.45	.004
Soap	.110	≤ .05	1.3	1.3	1.5	7.69	.001
Stereo sound system	.104	≤ .05	1.9	2.1	2.2	5.82	.003
Watches	.096	≤ .05	2.0	2.2	2.4	6.11	.002
Oven in home	.066	≤ .01	1.6	1.8	1.7	1.51	.220
City transit system	-.048		2.6	2.5	2.4	1.24	.289
Milk	.036		1.7	1.7	1.8	0.12	.887
Live musical performance	.034		2.6	2.8	2.7	1.92	.147
Long distance buses	.011		3.2	3.3	3.3	0.60	.550
Railroad travel (passenger)	-.002		3.1	3.4	3.1	5.75	.003
Coffee and tea	-.001		3.4	3.3	3.4	0.47	.626

^aOn a scale ranging from *least willing* (1) to *most willing* (5).

A general trend toward making personal sacrifices is not likely to develop. Instead, when specific lifestyle changes or personal sacrifices are needed, the educational message must be specific—explaining the nature of the problem, the relationship of individual actions to the problem, and the specific individual response needed. For example, prewrapping of fresh foods was one of the few items that the students of 1990 were more willing to give up than were those of 1971. This was one of the few items on the list that had been the target of an educational campaign (reduced packaging of foods) in recent years. Thus, when the message is heard and believed (i.e., logical connections are visible or made clear between people's actions and the effect on the environment) and de-

sired actions are described, it appears that behavior will be affected. Note that the largest difference between 1971 and 1990 was for the willingness to give up beef steaks. This dramatic change is more likely the result of health messages calling for reduced intake of fats and protein in the form of red meat (National Research Council, 1989). It certainly seems that change will likely result if a message is specific and clearly explains the consequences and benefits of individual actions for the individual.

Another major finding of this research was the high correlation of willingness-to-give-up items with the NEP growth and technology scale. Students who believe that technology and growth will solve environmental problems were less likely to make personal sacrifices. A num-

TABLE 12.—Pearson Product-Moment Correlations Between Willingness-To-Give-Up Score (GIVEUP), NEP Growth and Technology Score, Belief in Limited Resources (BELIEF), and Political Orientation (PO) for 1990 Cornell University Students

Variable	Correlation (significance)			
	GIVEUP	NEP	BELIEF	PO
GIVEUP	1.00	.36 (< .001)	.13 (< .001)	-.14 (< .001)
NEP	.36 (< .001)	1.00	.22 (< .001)	-.32 (< .001)
BELIEF	.13 (< .001)	.22 (< .001)	1.00	-.07 (=.028)
PO	-.14 (< .001)	-.32 (< .001)	-.07 (=.028)	1.00

ber of other researchers have pointed out the conflict between those desiring growth and technological solutions and environmentalists (Luten, 1980; Morrison, 1973; Yankelovich & Lefkowitz, 1980). This suggests that a belief in growth and technology may be an impediment for some people to accepting this new target of environmental effort, namely changing personal lifestyles. This must be addressed in environmental messages. Increased efficiency can only partially solve resource shortage problems; eventually people will have to learn to do with less (Daly, 1980).

Also, the high correlation between willingness-to-give-up items with the NEP growth and technology scale suggests that this scale can be used as an indicator of willingness to make personal behavioral changes for environmental reasons. This would be useful for future trends studies, because an obvious problem with the use of willingness-to-give-up items for use in trends studies is the fact that items can quickly become outdated and new ones constantly come into common use. For example, the personal computer was not a common household item when the 1971 study was conducted at Cornell University. McGuire (1992) modernized Thompson and Gasteiger's (1985) willingness-to-give-up items scale by replacing some of the outdated items for his study of the environmental attitudes of Pennsylvania State University students. However, these changes preclude trends analysis and comparisons with other locations because the items are not identical.

Has Materialism Increased?

A number of researchers have suggested that concern for private materialism has increased among American youth at the expense of public concerns (Easterlin & Crimmins, 1991). Easterlin and Crimmins defined private materialism as the pursuit of one's own material well-being. Using a different approach, I also measured materialism and environmental concern as tradeoffs in

this study. As with Easterlin and Crimmins's findings, private materialism increased over roughly the same time period at the expense of environmental problems and issues.

Easterlin and Crimmins (1991, p. 500) hypothesized that this shift in values was caused by a "growing feeling of economic deprivation in the post-1973 period as real wage rates declined and material aspiration continued to rise." If this is a valid reason, then materialism has not necessarily increased but rather the concern for materialism has increased. Prior to 1973, citizens had experienced a period of continuous real wage increases that fueled a desire for material items. There was little need then to be concerned over materialism because people had become accustomed to increasing wealth and the ability to buy material items. In such a climate, as Maslow (1970) would predict, people could feel free to pursue other interests (e.g., self-fulfillment) or public issues, such as environmental problems.

Thus, materialism may have always been important but only when it is threatened does it become expressed as a concern and become more actively pursued. In other words, when it appears that expectations for materialism can be met, concern for material goods will be low, but when it appears that expectations will not be met, concern for material goods will be high. Accumulation of material goods may actually be higher during the periods of low concern for materialism. What does this say for the future of environmental issues? Will Americans have to experience a return of increasing economic well-being in the United States to have a return of increasing environmental activism? Not necessarily; Easterlin and Crimmins (1991) feel that the shift toward increasing materialism has just recently leveled off or has even begun to reverse. A decrease in expectation of increased material wealth may lead to a decrease in the pursuit of materialism and an increase in the importance of other values, such as family life, public interest concerns, or self-fulfillment. The environmental message that may assist

such a change should focus on how a clean environment can aid the attainment of these "other" values. However, a pessimistic viewpoint might suggest that the increasing gap between the rich and the poor (Krugman, 1992) may act to fuel materialism. More research is needed to determine the psychological, social, cultural, and economic influences on materialism.

Limitations of the Study

This study was conducted at Cornell University and may not reflect attitudes of students from other geographic regions or other socioeconomic mixes, nor is it likely to reflect the attitudes of people without college education. The purpose of this study was to conduct a trends analysis that roughly corresponded to the beginning of the environmental movement in North America (for which I only had data available for Cornell University students) and to identify an appropriate environmental attitude scale that would reflect willingness to make personal sacrifices.

Conclusions

This research began with the premise that solutions to today's environmental problems will require changes in personal lifestyle as part of the solution. The general conclusion was that today's students are less willing to make personal sacrifices than students of 20 years ago. The implication for environmental education is that, before people will be ready to make personal sacrifices for environmental reasons, the connections between today's lifestyles and environmental problems must be better understood. The second implication is that specific desired behaviors must be part of the message. Thus, not only must the connection between a personal behavior and an environmental problem be shown, but the new behavior that is desired must be specified. In addition, individual benefits from adoption of the new behavior will be necessary for all but the most environmentally concerned.

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