

Psychological Contributions to Achieving an Ecologically Sustainable Future for Humanity

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The most serious long-term threat facing the world is the danger that human actions are producing irreversible, harmful changes to the environmental conditions that support life on Earth. If this problem is not overcome, there may be no viable world for our descendants to inhabit. Because this threat is caused by human population growth, overconsumption, and lack of resource conservation, social scientists have a vital role in helping our world escape ecological disaster and approach a sustainable level of impact on the environment—one that can be maintained indefinitely. Enormous changes to human lifestyles and cultural practices may be required to reach this goal. This article discusses major obstacles to this goal, describes a variety of motivational approaches toward reaching it, and proposes that we should view the achievement of sustainable living patterns as a superordinate goal—a war against the common enemy of an uninhabitable world.

A central topic of this *Journal* issue is *sustainability*, that is, the urgent need for us to use the Earth's resources in ways that will allow human beings and other species to continue to exist acceptably on Earth in the future. In 1987, the Brundtland Report of the World Commission on Environment and Development (WCED) defined sustainable development as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (p. 363). Starkly stated, the issue is whether there will be a livable world for our descendants and other creatures to inhabit.

* Parts of this article are quoted or paraphrased from more extensive material in "A Sustainable Future for Humanity? How Can Psychology Help?" by S. Oskamp, 2000, *American Psychologist*, 55, 496–508 (copyright 2000 by the American Psychological Association; reprinted by permission). Later parts of the article add a psychological analysis of motivational issues relevant to sustainable living. Correspondence concerning this article should be addressed to Stuart Oskamp, Department of Psychology, Claremont Graduate University, Claremont, CA 91711 [e-mail: stuart.oskamp@cgu.edu].

Dangers to Earth's Environment

As a prelude to the articles that follow, I will briefly summarize some of the current drastic dangers to the Earth's environment (see Oskamp, 2000, for details). Most literate citizens are at least somewhat informed about them, and media coverage and popular awareness are increasing, but people typically are not aware of their potentially cataclysmic nature. It is important for all people to become environmentalists and to work toward reducing the damaging impacts of humans on the natural environment. Among the most serious dangers to the environment are

- Global warming due to the greenhouse effect. When oil, gas, coal, or wood are burned, the carbon dioxide (CO₂) that is produced mixes into the atmosphere. This CO₂ and other greenhouse gases absorb infrared radiation from Earth and thus reduce the amount of Earth's heat that is radiated into space, much as the glass roof in a greenhouse lets in warming sunlight but prevents warm air from escaping. According to the Intergovernmental Panel on Climate Change (IPCC), the amount of CO₂ in the atmosphere has been increasing very steadily and has reached levels unprecedented in geological history (IPCC, 1996). If this continues, the IPCC estimates that it will result in an average warming of the Earth's surface air temperature by about 3½ degrees Fahrenheit by the year 2100. This extra heat—even an average increase of 1 or 2 degrees—can change regional climates and disrupt agriculture worldwide. The polar regions are warming particularly fast, and a continuation of this trend will cause extensive melting of the polar icecaps, resulting in raised ocean levels and consequent flooding of huge low-lying coastal areas in many countries (Hileman, 1999; Schneider, 1997).
- Loss of much of the Earth's protective ozone layer due to release of chloroflourocarbons (CFCs). The extra ultraviolet radiation that penetrates the ozone layer causes damage to crops and skin cancer in humans (French, 1997; IPCC, 1996).
- Global climate change and great loss of biodiversity due to destruction of tropical and temperate rain forests (Bryant, Nielsen, & Tanglely, 1997).
- Overfishing and exhaustion of all the world's oceanic fisheries and decreasing agricultural productivity due to many unsustainable practices. The world's grain production per person peaked in 1984, and the world's fish production per person peaked in 1989, and both have subsequently fallen by 7–8% (Brown, 1995, 1999). A likely future scenario is that increasing demand for food combined with a single

summer's crop failure in one of the world's major agricultural nations will cause a dramatic escalation of world food prices and major famines in some nations.

- Acid rain, which damages forests and crops and also kills fish, plants, and other organisms in lakes and rivers (French, 1990; National Acid Precipitation Assessment Program, 1991).
- Toxic pollution of air and drinking water supplies. This is a worldwide problem (World Health Organization, 1992) resulting from humans overtaxing Earth's life-giving resources of air and water and its capacity for absorbing waste products.
- Genetic and hormonal damage and cancer due to exposure to dioxin and other toxic chemicals. A new and little-known example is research showing a nearly 50% decrease in average sperm count observed in men worldwide during the last 50 years, apparently due to the widespread use of chlorinated chemicals all over the world in those years (Colborn, Dumanoski, & Myers, 1996; Wright, 1996). Similarly, the dangerous carcinogen dioxin is now building up to alarming levels in the body tissues of most Americans (Schechter, 1994).

The Centrality of the Social Sciences

In thinking about environmental problems such as these, it is essential for us to realize that they are *not* solely technical problems, requiring simply engineering, physics, and chemistry for their solution. There is a crucial role for the social sciences in these problems because *they are all caused by human behavior, and they can all be reversed by human behavior.* Another key point is that *most of these problems are getting more serious each year*, so it is urgent that we do much more to reverse them (cf. Oskamp, 1995a). In fact, *United Nations estimates predict that 20% of the world's population (nearly 2 billion people) will become "environmental refugees" by the year 2020 because of environmental damage in their areas, destruction of cropland, lack of water, and so on (George, 1993).*

The United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil, in 1992, focused world attention on these problems and agreed on a plan of action for addressing them, called Agenda 21. Progress on these goals is being monitored by the UN Commission on Sustainable Development and by national agencies and citizen watchdog groups in many nations (Bartelmus, 1994). Progress has been sporadic, however, and slow at best, and the U.S. government has frequently played an obstructive role. For example, the 1997 international summit meeting in Kyoto, Japan, which was held to establish enforceable goals for nations to reduce the greenhouse gas emissions that are producing global warming, was impeded by U.S. government proposals that advocated minimal goals. As a

result, it set only very weak and distant targets and established no enforcement mechanisms (Fishel, 1998; Lemonick, 1997).

Fortunately, opinion polls from many nations show that most people have high levels of concern for environmental problems. In the United States, pro-environmental attitudes hit an all-time high in the 1990s, and a large majority of people now call themselves “environmentalists” (Dunlap, Gallup, & Gallup, 1993; Kempton, Boster, & Hartley, 1995). Yet surprisingly, at this time of high public support for environmental preservation, many legislators in Congress and in some state legislatures are bent on reversing the environmentally protective legislation of the last 30 years. This attack is being supported by much of big business, such as oil and mining companies, cigarette manufacturers, and drug companies, with the claim that they are merely opposing unnecessary and wasteful government regulations. Unless voters are vigilant in registering their views, there are likely to be even more cutbacks in U.S. environmentally protective laws, regulations, and budgets.

There are three main sources of Earth’s environmental problems: human overpopulation, overconsumption, and underconservation.

The Threat of Population Growth

The central source of the Earth’s environmental problems is human population growth. Figure 1 shows the fantastic recent growth of the world’s human population. For millions of years of human existence, the number of people on Earth remained small, eventually reaching 1 billion about 1800; then it took over 100

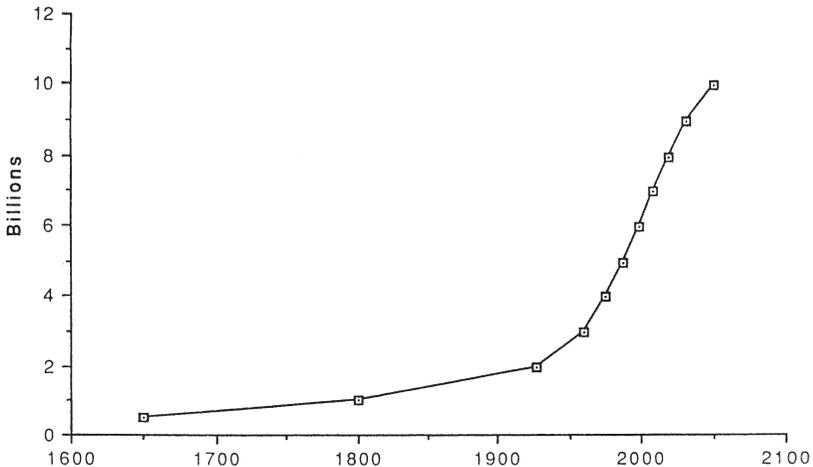


Fig. 1. World population growth since 1650
Source: The Population Reference Bureau, Inc.

years to reach 2 billion in 1930. It took only 30 years to reach 3 billion in 1960, and only 15 years to reach 4 billion in 1975. In 12 years the total reached 5 billion in 1987, and in another 12 years it hit 6 billion in 1999 (Brown & Flavin, 1999; David, 1994).

This geometric increase in human population is extremely dangerous for the Earth, and obviously this trend cannot continue much longer. The huge population increases have already brought miserable living conditions, malnutrition, and illness to about half of the people of the world. If we don't control human population growth voluntarily, it will eventually be controlled coercively. The death rate *will* catch up with the birth rate—either through starvation and famines, through diseases (e.g., AIDS, which is already ravaging Africa), or by wars and genocide (Hardin, 1993).

No one knows exactly how many people the Earth can support, but some environmental scientists have concluded that we may already have overshoot Earth's long-term carrying capacity (Cohen, 1995; Hardin, 1993; Meadows, Meadows, & Randers, 1992). For instance, a study by Pimentel, Harman, Pacenza, Pacarsky, and Pimentel (1994) estimated that the Earth may be able to support only 3 billion people in perpetuity (about half the number of people alive today) and only 1–2 billion people if they are to live in "relative prosperity." That conclusion means that we are literally stealing vital life resources from our descendants.

The Trap of Overconsumption

The second main source of the Earth's environmental problems is overconsumption of natural resources, a widespread pattern that is like an addiction to unsustainable consumerism (cf. Clinebell, 1998). In particular, the affluent, industrialized nations are exhausting the natural resources of the poorer, developing nations by their overuse of energy and raw materials. The most extreme example is the United States. With only 5% of the Earth's population, the United States uses about 25% of the Earth's commercial energy, and uses it only about half as efficiently as Japan (Flavin & Dunn, 1999). Together, the industrial nations of the world have about 20% of the world's population, but they consume about 85% of the world's paper and automobiles (United Nations Development Programme, 1998). The level of use of the world's resources by a particular nation has been termed its "ecological footprint." Estimates indicate that increasing the rest of the world to the resource-use level of the United States and Canada would require the land and other natural resources of three Earths—an obviously impossible ambition (Wackernagel & Rees, 1996).

The result of worldwide overconsumption of the Earth's resources is that traditional supplies of many materials are being used up rapidly. A key example is petroleum: Its production has expanded greatly in the last 25 years, but known reserves have increased only slightly, with the result that world oil production will

probably peak and begin to decline about 2010 (Campbell & Laherrere, 1998; Flavin & Dunn, 1999). Since much of the industrialized world runs on oil, this will have a dramatic impact on many aspects of life. It is true that modern nations have pioneered in developing synthetic materials such as plastics and chemicals to substitute for natural materials that are becoming scarce or costly. These synthetics, however, are mostly made from petroleum, further decreasing its reserves. Moreover, synthetic products made from organic chlorine compounds have been shown to have many dangerous ecological and health effects (e.g., Colborn & Clement, 1992; Misch, 1994), and plastics persist for centuries in trash and landfills without disintegrating.

The Tragedy of Underconservation

Paralleling the problem of overconsumption is the third main source of the Earth's environmental problems: underconservation of natural resources. The solution to worldwide overconsumption is twofold: reducing overall consumption and shifting to universal reuse of products (e.g., resale, remanufacturing, or sharing) and recycling of their constituent materials when the product's life is ended (G. Gardner & Sampat, 1999). These changes toward full conservation of raw materials would constitute a revolution in modern Western production and consumption practices, but there are already many successful examples of these needed conservation practices that can point the way for producers and consumers alike (cf. G. Gardner & Sampat, 1999).

The U.S. Environmental Protection Agency (1992) has popularized the slogan "reduce, reuse, recycle" to describe three key ways to decrease our overuse of natural resources. "Reduce" means attacking the problem of overconsumption by using less natural resources in the first place. "Reuse" and "recycle" refer to two ways of conserving raw materials by using them again. "Reuse" means using them again in the same form, whereas "recycling" means collecting manufactured products and changing their form (e.g., by crushing, shredding, or melting them down) for use in making new products.

Reuse

Many older Americans can remember when soft drink bottles (such as glass Coke bottles with their famous voluptuous shape) were returned to the bottler, sterilized, refilled with soft drinks, and resold. This reuse process saves the raw materials and the energy involved in making new containers for every batch of soft drink that is sold, and it also provides employment for individuals who collect and process the returned bottles (Shireman, 1993). It is still used in some places: for example, for refilling milk bottles in some European countries and soft drink bottles in many developing countries. Though this reuse process has been abandoned for most liquid

consumable products in most developed nations, returning to it would save huge amounts of raw materials and avoid the environmental problems involved in recycling used materials or disposing of them in landfills or by incineration.

Recycling

Recycling has been adopted in the United States and many other developed countries as an easier way of ensuring that large amounts of natural resources are used again in productive ways rather than being dumped in landfills, where they often contribute to pollution problems. For instance, aluminum cans are melted down and used in making new aluminum products, many sorts of glass are collected and melted to make new glass containers, old tires are shredded and used as one ingredient in making new pavement, and recycled paper and rags are made into new paper products. In the case of some materials like aluminum, recycling can save enormous amounts of energy and pollution that are entailed in the original smelting of ore. However, there is always considerable waste resulting from original products that are not collected and recycled (around 10% in the case of aluminum cans—even in states where “bottle bills” provide cash payments for their return—and much higher percentages for most other products; Shireman, 1993). Also, the recycling process is less efficient than reuse because the raw material typically becomes degraded in recycling, and consequently the recycled products have lower quality than originally (e.g., recycled paper products have shorter fibers and therefore are less useful for some purposes).

The conclusion is clear that we have to stop destroying our environment (e.g., by polluting the air and water, dumping toxic and nuclear wastes, overdrawing water supplies, and overconsuming other natural resources). We have to transform the current destructive patterns of human behavior into ones that are sustainable over the centuries ahead.

Research Contributions to Sustainability

How are we going to meet this challenge and achieve sustainable patterns of living? As stated above, the social sciences are central to resolving problems that stem from patterns of human behavior, and they can make many contributions to the goal of sustainable lifestyles. As a reminder of their potential, consider these environmentally relevant areas that have been productively studied by social scientists (cf. Oskamp, 1995a).

- Population control and family planning programs have been disseminated widely (cf. Severy, 1993). A notable finding in this area is that increased economic opportunities for women constitute an important incentive to limiting family size (Abernethy, 1993).

- Energy conservation methods have been extensively studied (e.g., Katzev & Johnson, 1987). Research has shown that one-time investments, such as buying more efficient cars or installing home insulation, can save dramatically more energy than repeated minor actions like turning down thermostats or turning off lights (G. T. Gardner & Stern, 1996).
- Resource conservation and recycling are more recent areas of study. In the Los Angeles suburbs, my research group has found dramatically high rates of participation in local recycling programs (as high as 90%) but also a potential for recycling much greater amounts of materials (cf. Oskamp, 1995b).
- Avoiding global environmental changes is a crucial goal that is beginning to be studied (cf. Stern, Young, & Druckman, 1992). For long-term climate control, much more research is needed on ways of decreasing use of fossil fuels and of preserving both tropical and temperate rainforests.
- In accomplishing changes in environmental behavior, research has shown that the greatest success is likely to come from using a combination of different types of interventions (e.g., using educational interventions together with incentives, normative pressures, and/or removing barriers to change; Stern, this issue).

How Can We Communicate the Need for Living Sustainably?

Now let us consider how we can put across the message that we have to change to a sustainable lifestyle. Unfortunately, major lifestyle changes are often resisted, and this message is especially apt to be unpopular. The theme of using less resources suggests that we'll have to cut back on the comforts of life and "make do" with less. When someone brings an unwelcome message like this, the messenger is apt to be shot—or at best ignored! Consequently, political leaders are afraid to tell us; they promise growth and improvement rather than cutbacks or reductions. Similarly, many economists and business leaders believe in perpetual growth and try to persuade us that expansion can continue indefinitely. But remember the geometric curve of population growth: It can't continue!

Economists are so focused on growth that they count *losses*, such as resource destruction, as part of a nation's gross national product (GNP). For example, the GNP includes expenditures involved in using up all our oil reserves, cleaning up toxic dumps, and building nuclear missiles that we hope will never be used. These expenditures aren't productive of human welfare. Also, advocates of growth often don't consider what are called "externalities" when they compute the costs of products. For instance, the price of nuclear energy doesn't yet include the huge but

inevitable “external” costs of eventually cleaning up nuclear wastes and decommissioning expired nuclear plants. In fact, we have not even figured out how to do these things.

Hence, the GNP is a misleading indicator of a society’s welfare (Daly, 1996). A much better measure of a nation’s genuine progress and productivity would be an “index of sustainable economic welfare” (ISEW). Such a measure should add the value of unpaid, voluntary work (e.g., housework, child care, volunteer programs) but subtract the costs of nonproductive expenditures such as pollution control, crime control, and depletion of nonrenewable resources (Cobb & Cobb, 1994). Developing such improved measures of sustainability is an important task for social scientists (e.g., Bartelmus, 1994).

How Much Behavioral Change Is Needed?

In the long run, our society will have to get by with using far less resources per person and will also have to reduce the number of people. In particular, because of the greenhouse effect, we must quickly and sharply reduce our use of fossil fuels and use them much more efficiently. The Environmental Protection Agency has estimated that avoiding global climate changes will require a 75% decrease in CO₂ emissions, and thus of fossil fuel use, continuing over many decades (Lashof & Tirpak, 1989). Because the United States is not only the largest user of energy, but also the most wasteful, our nation’s behavior change is critical to the world.

The prophets of growth often propose that technology will solve this problem by using our resources much more efficiently (e.g., Ausubel, 1996). Indeed, technology *can* fill part of the gap—but only part. The widely publicized Brundtland Commission proposal for supposed “sustainable development,” entitled *Our Common Future* (WCED, 1987), made the following forecast for the year 2050: a technology twice as efficient, for a world population twice as large as in 1987 (10 billion people), and a world economy 5–10 times greater than in 1987. The economics of this scenario sound attractive, but its environmental impact would be terrible!

A good way to analyze such scenarios for their environmental impact is the formula $I = PAT$ (Ehrlich & Ehrlich, 1991). It considers I (impact) to be a function of P (population size), A (affluence per person, which increases natural resource consumption), and reasonable estimates of T (technological improvements, which can decrease resource use per capita, if channeled wisely). Applying this formula to the Brundtland Report shows that its scenario is not a sustainable one: It would produce an environmental impact on the Earth two-and-a-half to five times the current level (Olson, 1995).

Achieving a sustainable society will require basic changes in everybody’s behavior and in our basic values. As shown in several of the articles in this issue, environmental psychologists are engaged in debates about how best to achieve

these changes and what kinds of variables are most important to emphasize (e.g., behaviors, values, attitudes, beliefs, incentives, norms, or barriers to behavior change).

In the realm of values, our nation has a particularly strong value of *human mastery over nature* (Kluckhohn & Strodtbeck, 1961), which is well illustrated by the injunction in the book of Genesis (I, 28): “be fruitful and multiply, and replenish the earth, and subdue it: and have dominion over . . . every living thing that moveth upon the earth.” We need to change that value to one of *harmony with nature*, focusing on what will benefit all people and the whole world in the long run.

Obstacles to the Needed Changes

There are two major sources of opposition to the great changes needed for a sustainable world. The first source is national governments in many countries and multinational corporations, both of which profit hugely from consumption of resources, such as timber, oil, and minerals, and from processes that pollute the Earth, such as production of chemicals, plastics, and pesticides. In fact, multinational companies have become so powerful that they are laws unto themselves, often able to resist or overrule the edicts of national governments that have passed laws or regulations to safeguard or preserve natural resources. In these preservation efforts, local governments and community groups are often most actively involved because they are closer to the scene and they experience the dangers more directly. Excellent examples of grassroots environmental activism are presented in the article by Bullard and Johnson (this issue). Such local activists need as much help as possible from people everywhere in the world to fight against environmental destruction wherever it is occurring.

The second source of opposition to changes toward sustainability is individual people themselves, who very often resist major changes in their lifestyles. This resistance has many potential sources, including (a) inertia, which may postpone action until the environmental damage is irreversible, (b) the danger that appeals to fear will backfire and lead people to deny the environmental threats, (c) the belief that technological improvements alone can save the environment, and (d) opposition to the necessary lifestyle changes because they are perceived as requiring sacrifice and poverty.

The Issue of Motivation

This brings us to a central issue, the problem of motivation. How can we motivate ourselves and other people to make these vitally needed changes? De Young (this issue) has stressed that we should aim to appeal to motives that are both reliable and durable in their effects on behavior. Here I will briefly address each of the above sources of individual motivational resistance.

Inertia

Unfortunately, major lifestyle changes typically occur only in response to major crises (for instance, even the great behavioral changes produced by the AIDS epidemic have still not been enough to make most people's sexual behavior safe). Will we have to wait for a huge catastrophe that kills hundreds of millions of human beings before people everywhere become convinced of the need for drastic changes? Despite the drag of inertia, the motive of self-interest is a powerful one that we can appeal to in trying to create a healthier, less-polluted, sustainable world (cf. De Young, this issue).

In efforts to overcome inertia, publicity through the mass media is a crucial influence. Every available media avenue needs to be enlisted in the campaign to inform people, motivate them, and accomplish behavior change that will help save the environment. Yet at the same time, we need to reject the media's constant appeals for consumption, and that is a difficult combination to achieve.

Appeals to Fear

A basic difficulty in promoting behavioral change with respect to environmental issues is that the environmental problems we have been discussing stimulate fear, and social psychological research has clearly demonstrated the complications involved in using fear stimuli. Essentially, people don't like to think about fearful topics, and they frequently repress or deny such information. Clear examples can be seen in inattention to and denial of the dangers of global warming and the ozone hole. Despite the overwhelming scientific evidence to the contrary, there are state legislators and congressional representatives who are claiming that CFCs do not pose any environmental danger and are trying to get the United States to return to making and using them, thus violating the Montreal Protocol treaty, which banned production of CFCs. Similarly, many politicians have been objecting to even the weak and distant goals of the 1997 Kyoto climate conference as being damaging to U.S. industry and "progress," ignoring the drastic danger that global warming poses to living conditions on the entire planet (Broder, 1997).

Research studies on appeals to fear have shown that they are most likely to change people's behavior under two conditions: (1) if people are aware of clear steps they can take to protect themselves, and (2) if these steps are conveniently available (e.g., Leventhal, Meyer, & Nerenz, 1980). Unfortunately, because of the nature of environmental problems, neither of these conditions is easily met:

- Environmental problems are large, so people feel they can do little on their own.
- Environmental problems are long-term, so there are no immediate solutions.

Belief in Technology

As mentioned above, it is often proposed that technology will solve this problem by enabling us to use our resources much more efficiently (e.g., Ausubel, 1996; Simon, 1995), and most Americans have a great faith in progress stemming from technology. Though the Brundtland Commission proposal for supposed “sustainable development” does not actually represent a sustainable scenario, it would be wise to harness and use people’s beliefs in technological progress, rather than trying to dispute them (see next section).

Dislike of Sacrifice and Poverty

It is apparently a universal human tendency to avoid losses and poverty and to dislike making sacrifices. Therefore it is apt to be counterproductive to describe sustainable living in terms of making sacrifices (cf. Kaplan, this issue).

An often-cited example of this tendency to avoid personal sacrifices is the so-called *tragedy of the commons* (Hardin, 1968). This term refers to people’s typical pattern of using community-owned resources (like the environment) profligately, because they pursue their own short-term individual benefit and ignore the long-term negative consequences to their whole society. This outcome is even more likely when the long-term consequences can’t easily be seen, such as the risk of cancer from chemical pollutants or of climate change from cutting down rainforests. However, offsetting this selfish human tendency, there is widespread research evidence showing that the condition of common natural resources (e.g., pastureland or crab fisheries) has prospered for long periods when managed by small community groups that developed and enforced a system of mutual norms and rules (e.g., Gardner & Stern, 1996, p. 30).

People have adaptation levels to their customary environmental conditions, and they generally display reactance against changes that they perceive as detrimental to them. Thus, the idea of sacrificing personal advantages or comforts in order to advance the general welfare is apt to be unpopular. The concept of “sacrifice” is a perceptual one, however, and people often make great sacrifices in order to attain goals that they believe are vital: For instance, think of the privations that people willingly undergo in human warfare, religious movements, or voluntary immigration to a new country. I believe we need to harness this overarching motivation in our efforts to preserve the environment (see next section).

Possible Motivational Approaches

So what positive motivations can we appeal to? Many possibilities are discussed in the following articles in this issue. To begin the dialogue, here are six

motivational approaches that cover a wide gamut and may be differentially effective with various types of people.

1. *Voluntary simplicity* as an overall, committed lifestyle has been advocated by Elgin (1993). This means “living lightly on the Earth”: a way of life that is outwardly simple and uses the minimum necessary amount of natural resources and technology. In global perspective, it requires all nations to share the Earth’s resources efficiently, peacefully, and equitably (Elgin, 1993, p. 42). According to its proponents, this way of life is also inwardly rich: alive, immediate, and poignant in its appreciation of simple experiences and pleasures rather than unneeded material luxuries (pp. 145–146). “It is to live with balance—taking no more than we require and, at the same time, giving fully of ourselves” (p. 157). Currently, it seems that only a few people are willing to make this broad a commitment in all areas of their lives, but the environmental problems facing the world demand that everyone move in that direction. Among the major changes that are necessary for a sustainable world are

- value changes toward harmony with nature
- emphasizing long-term goals of environmental protection
- changing many specific behaviors in a proenvironmental direction
- publicizing and avoiding short-term environmental damage

De Young (this issue) has advanced a similar motivational concept, stressing that four types of intrinsic satisfactions are important supports for environmentally responsible behavior: satisfaction from striving for behavioral competence, from frugal, thoughtful consumption, and from participation in valuable community activities, but also from enjoying some of our society’s conveniences and luxuries. This viewpoint avoids the implications of self-sacrifice that are often present when altruistic motivations for environmentally responsible behavior are emphasized.

2. Encouraging *specific, concrete actions that are effective* in reducing resource use. This is a promising initial approach because everyone can take some actions easily. For instance, people might install energy-efficient lights, recycle bottles and newspapers, buy recycled products, and carpool or use mass transit. In getting people to do these things, we need to do much more than just *inform* them about desirable actions. We also need to *motivate* them to make behavioral changes, for research shows that simply providing information without strengthening motivation has very little effect (G. T. Gardner & Stern, 1996).

Many useful guides are available to help people find convenient and practical steps toward reducing their resource use (e.g., EarthWorks Group, 1989). In this issue, excellent examples of effective approaches are presented

by Bator and Cialdini and by McKenzie-Mohr. In addition, an organization called Renew America has published an extensive collection of “success stories” about effective community participatory activities that have positive environmental impacts (see Kaplan, this issue).

3. A third motivational approach is *providing clear behavioral norms*, one of the most important ways to create motivation. Norms can come from many sources, but in our society laws and regulations are often crucial in establishing norms. In the environmental area, a few examples are

- For decades, open burning has not been allowed in Los Angeles County, in order to reduce smog.
- American cars have to pass increasingly stringent smog checks.
- Federal fuel-efficiency standards for autos were a great factor in reducing petroleum consumption. Unfortunately, Congress scaled back that objective in the 1980s and also allowed pickup trucks and sport utility vehicles (which are much less fuel-efficient) not to be counted in computing the fleet average.
- The United States and most other nations of the world have agreed to the Montreal Protocol, phasing out the production of CFCs.

We need more and more-specific environmental regulations and norms to guide our actions. One very good one was a California requirement that ZEVs (zero-emission vehicles—currently these are electric cars and vehicles powered by fuel cells) had to make up 2% of cars sold in California by 1998. Unfortunately, the California Air Resources Board postponed that requirement in 1996, sending exactly the wrong normative signal.

4. A fourth motivational approach is *harnessing beliefs in technological progress*. Technology can be of great help in using natural resources more efficiently, and we should not reject that as a partial goal. Instead we should emphasize the extreme amount of increased efficiency that is necessary for sustainability. For instance, Olson (1995) proposed a “sustainable community” scenario that involved, not just a doubling of technological efficiency as envisioned by the Brundtland Report, but a 50-fold increase by the year 2050. Though it is not clear whether such massive increases are attainable, there is no doubt that setting them forth as a worldwide goal would be a major impetus to innovation and change. In a similar effort, Lovins (1977, 1980) has spent over 20 years advocating major increases in energy efficiency and demonstrating how they can be realistically achieved.
5. A fifth motivational approach is use of *carefully organized group activity*, which can help to build what Bandura (2000) has termed a sense of collective efficacy. Organized activism is frequently necessary in order to help reduce or

prevent environmental damage, because polluters are very often governments or powerful corporations that can ignore individual complaints. Grassroots political organization and advocacy is difficult, but sometimes it can be remarkably effective in changing public policies in the direction of greater environmental justice for socially disadvantaged groups (cf. Bullard & Johnson, this issue). As mentioned earlier, the mass media are very important influences in developing such group pressures, and every available media avenue needs to be enlisted in the campaign to promote sustainability.

6. A sixth motivational approach is emphasizing the achievement of sustainable living patterns as a superordinate goal that all nations and peoples can share (Sherif, Harvey, White, Hood, & Sherif, 1961)—*a war against the common enemy of an uninhabitable Earth*. This kind of a worldwide campaign can use William James's (1911) concept of a "moral equivalent of war" as the motivational force underlying steps toward the goal of sustainable lifestyles. We need nothing less than this level of fervor in order to accomplish the necessary changes in time to forestall environmental disaster.

Questions for Social Scientists

The points raised above lead me to seven questions about strategies that social scientists should employ in their efforts to achieve sustainable living. I will list them here as a stimulus to thought and discussion:

1. What is the best combination of interventions to use and motivations to appeal to in getting various types of people to adopt environmentally responsible patterns of behavior?
2. How can we best enlist the mass media to promote sustainability and at the same time reject their theme of consumerism and overuse of resources?
3. Should we play down the use of appeals to fear about environmental degradation because we can't offer clear, short-term, effective steps that individuals can take to protect themselves?
4. Should we approach the need for behavior changes by first emphasizing easy, small steps (cf. Weick, 1984) rather than major value changes or reversals in lifestyles?
5. Will it take a major crisis, such as hundreds of millions of deaths, before public opinion is mobilized to action on environmental preservation? And will that happen too late to reverse current trends such as global warming and ozone depletion?

6. How can we best motivate people to avoid the tragedy of the commons—that is, to avoid pursuing their own short-range self-interest at the expense of global, long-term environmental degradation?
7. How can we generate the fervor of a “moral equivalent of war” in our campaign to preserve the environment?

Conclusion

To create a sustainable world, we need everybody's participation. The goal must be to reach a level of environmental impact, as quickly as possible, that will be sustainable for our grandchildren and their grandchildren. Each of us can do many things. We can buy fuel-efficient cars, install extra home insulation instead of running our air conditioners or furnaces, recycle thoroughly, use mass transportation, and limit our families to one or two children. We can also support politicians and other leaders who work for these goals, and we can help to establish social norms by praising our family, friends, and neighbors for their steps toward adopting simple lifestyles. All of us are crucial in this effort. Everything that we can do will benefit our grandchildren—and the whole world.

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