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Psychological Correlates of Pro-environmental attitudes.

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Abstract

Endorsement of sustainable policies and programs is measured in two different questionnaires. Correlations between these measures and several other psychological measures are presented, demonstrating positive relationships between sustainability endorsement and several pro-social traits, e.g. kindly religious beliefs, human rights endorsement, endorsement of kindly religious beliefs, and endorsement of government serving citizens as members of the community overall. Negative correlations are found with several anti-social traits, including warmongering endorsement, endorsement of religious fundamentalism, social disenfranchisement, and endorsement of military dictatorship. Implications for possible evolutionary origins of these clusters of traits as aspects of liberal and conservative political orientations are discussed.

Psychological correlates of pro-environment attitudes.

There is a substantial history in psychology of research on issues related to the environment generally and, more specifically, to issues of sustainability, global warming and climate change. This literature has been reviewed periodically (Fransson and Garling 1999; American Psychologist 2000; Bechtel and Churchman 2002; and Swim et al 2009). The references for the 2009 article, an APA task force report, extend for 63 pages totaling approximately 630 citations, most of which date back to about 1978 covering a thirty-year span.

Fransson and Garling point out that many psychologists have thought that educational efforts must precede necessary changes in citizen behavior to preserve the environment. However, they cite evidence that efforts to permanently change behavior by such interventions have rarely been effective.

They also point out that environmental concern has been related theoretically to attitudes and beliefs in general and religious beliefs in particular, citing references. They also mention "concern for the environment" as a relevant human trait or attitude as measured in three scales in particular, the Ecologial Attitude Scale (EAS), the Environmental Paradigm Scale (EPS), and the New Environment Paradigm Scale (NEPS). The EAS in a 45-item version measures verbal commitment, actual commitment, affect and knowledge dimensions. The NEPS in 12 items measures a pro-ecological worldview with a Cronbach alpha reliability of .80.

Fransson and Garling also refer to work by Van Liere and Dunlap (1981) who measured environmental concern in six different ways including attitudes toward governmental actions, population, and overuse of natural resources. All of their measures had reasonable internal consistency. Correlations with other variables were not strong but tended to be positive with income, living in a single-family dwelling, urban living, having a sense of control over one's life, and holding liberal rather than conservative political views.

To explain environmentally relevant human behavior Fransson and Garling present a rather complex theory of the relationship between various values, attitudes, habits, intentions, and situational constraints but include no reference to politics or government as elements in spite of the fact that fossil fuel use, population control, military activity, and natural resource use are major drivers of human effects on the environment and subject primarily to government policy.

The May 2000 issue of the American Psychologist was devoted to articles about the environment. Stuart and Osterkamp (2000), suggest that psychologists should promote laws and regulations of pro-governmental nature, such as ones requiring reduction of smog, use of fuel-efficient cars, reducing pollution, and increasing media messages to redirect consumerism. They also suggest an international effort, a "war against an uninhabitable earth." However they do not offer specifics as to how psychologists might promote such efforts.

In the next article of this issue of the American Psychologist Howard (2000) cites several books by psychologists espousing awareness of environmental issues to change public attitudes and lifestyles. However he then cites research data that shows that such

efforts are relatively ineffective. He offers nine beliefs ("Killer Thoughts") that tend to sabotage such efforts, such as citizen preference for present consumption over conservation for the future. He believes that "more self-change by each person is required to produce the enormous changes necessary to chart a sustainable course for the world." This belief is difficult to comprehend given the evidence he cites that informational approaches aren't effective in causing behavior change.

In the next article Winter (2000) calls for a great many psychologists to effect needed citizen behavior change, recommending efforts to influence government policies, such as taxes, and policy makers themselves. However she too advocates the individual approach, asserting that citizens must be changed to cause changes in the politicians that represent them in government.

On a broader focus she acknowledges that economic systems may have to be revised to control excessive use of resources and proposes that egalitarian, more than hierarchical, worldviews might foster this sort of change. By these opinions she implies that perceptions, thoughts, worldviews and governments will have to change. She cites the U.S. military as a major environmental polluter and urges psychologists to pressure policymakers in big institutions, presumably to include the military and governments, to demonstrate more environmental responsibility. While she does not cite work by political psychologists, she does encourage a diversity of theoretical and research approaches and urges haste.

In the next article Stern (2000) also encourages an interdisciplinary approach. He opines that individual behaviors are constrained by community designs. He wonders how wealthier nations can urge poorer ones to consume less than they consume themselves.

He cites international polls and cultural traditions that indicate that environmental concern is high among most citizens. He notes that psychological efforts via informational approaches have not been very effective in causing behavior changes; situations may be more important determinants of behavior than individual citizen attitudes. In light of this he implies that government policy changes may be the most effective way to instigate citizen behavioral changes needed for sustainable communities. Specifically he suggests that policies, technologies, laws and regulations may have to be changed at the national level.

In this context he wonders how individuals in organizations make decisions that are pro-environment and how citizens in communities do or don't support environmental government policies. He refers to global issues affecting sustainability, including population growth, migration, economic growth, cultural values and beliefs, and social and political organizations. He sees all of these as relevant topics of investigation and intervention.

He urges open-mindedness and courage saying "to build knowledge for solving environmental problems psychologists need to question some disciplinary presumptions. Doing this may lead researchers into unfamiliar intellectual territory but such exploration is important to scientific progress... in sustainability...."

In the last article in this series McKenzie-Mohr asserts that may community-based social marketing programs have been more effective in promoting sustainable behavior than have many information-intensive campaigns. He urges preceding such programs with research to identify behavioral barriers to change but notes that the U.S.

government, in the voice of the Environmental Protection Agency (EPA), has been reluctant to fund this aspect of research. Again government policy plays a central role.

In 2002 Bechtel and Churchman served as editors for the Handbook of Environmental Psychology. Their articles cite several studies of particular interest. For example, Hine and Gifford (1991) developed a verbal commitment questionnaire of 10 items such as “Telephone the local government to register a complaint regarding current sewage dumping procedures.” Raw sewage was being pumped into the ocean locally. 104 students served as subjects who, after education about the sewage practices, completed the questionnaire and were invited to sign a petition to the local government. Persons politically left were more likely (.36) to verbally commit to taking constructive action on this matter.

Hines, Hungerford and Tomera (1987) conducted a meta-analysis of ten years of environmental studies, finding trait correlates of responsible environmental behavior: Verbal commitment .49, locus of control .37, attitude .35, personal responsibility .33, knowledge of the environmental issue .30, educational level .19, income, .16, economic orientation .16, age -.15, and gender .08.

Jones and Dunlap (1992) found that education, liberal political opinions and urban residence were positively related to pro-environmental attitudes, while age and employment in extractive industries, such as mining, were negatively related.

In addition to these earlier studies, Garling, Fujii, Garling and Jakobsson (2003) measured attitudes about the environment and found two types, “pro-social” persons and "pro-self" persons. Pro-social types were defined as those endorsing environmental concern measured by three statements in 9-option Likert format, including “I feel a moral

obligation to protect the environment." The alpha reliability of this scale was .84. In a game exercise, pro-social subjects chose cooperative options rather than individual and competitive ones. The pro-social (pro-environment) persons outnumbered the pro-self subjects 231 to 145, constituting 61% of the group.

Kaiser, Doka, Hofstetter and Nanney (2003) developed a 65-item scale of ecological behavior, consisting of items such as "I use energy-efficient light bulbs" and "The heater in my house is shut off late at night." For this scale some researchers have documented relatively good correspondence between scores and actual behavior, suggesting the measure has some validity. The scale alpha reliability has ranged from .71 to .88.

Corral-Verdugo, Carrus, Bonnes, Moser and Sinha (2008) have developed a "New Human Interdependence Paradigm" scale (NHIP) for measuring attitudes about the environment, finding it slightly better than prior scales, the Human Exception Paradigm (HEP) and New Environmental Paradigm (NEP) scales, for predicting water conservation behavior (e.g. washing a car with water in a bucket rather than a hose, and watering plants at night) in several different nations. They consider their work to be based on the concept of "Sustainable Development", which addresses the conflict between human demands on world natural resources and the fact that many of those resources are limited.

The NEP-HEP scale (above) consists of 12 items measuring the environmentally protective NEP orientation, which emphasizes human protection of resources, and the HEP orientation, which emphasizes the human exploitation of resources. Their NHIP scale consists of just 5 items in Likert scale format that purport to blend these prior worldviews, e.g. "Human beings can progress only by conserving nature's resources" and

“Human beings can enjoy nature only if they make wise use of its resources”. The alpha reliabilities for the NHIP scale ranged from .36 to .83 across four nations. The correlations between this scale and the water conservation measure were reported variously as .13 and .36.

Political psychologists Krosnick, Visser and Holbrook reported U.S. public opinion poll data gathered before and after an intense media coverage of global warming (Krosnick et al, 1998). Before the blitz most Americans believed that global warming was bad and should be combated. 77 percent said the world's temperature had been rising and would have bad consequences (more storms, 69%, reduced food, 57%). 59% said government and businesses should do a great deal or quite a bit to combat global warming, while a lesser portion, 44%, said ordinary people should, apparently reflecting a sense that government leadership would be necessary to have significant impacts. Specifically, 88% thought the U.S. Government should limit the amount of air pollution that U.S. businesses can produce and 71 percent thought government should require countries receiving foreign aid to reduce their pollution. These percentages were essentially as high after the media blitz, which was inspired by President Clinton and Vice President Gore, suggesting that the underlying attitudes were deep-seated, well-formed attitudes, not just a reflection of media information.

Closer examination of this poll data further revealed a widening gap between Democrats and Republicans, apparently reflecting political belief underpinnings of environmental attitudes. For example, before the blitz, 75 percent of strong Democrats thought global warming would occur in the future versus 67 percent of strong

Republicans. After the campaign, strong Republicans had dropped to only 55 percent, as if in protest, while strong Democrats remained convinced at 76 percent.

Ten years later, a widening gap in Republican and Democratic attitudes about climate change was reported (Dunlap & McCright, 2008). The authors note that polarization of environmental attitudes is stronger among political leaders than among the public. The Kyoto conference, calling for reductions in greenhouse gasses in particular, is cited as a turning point in an escalation of conservative opposition to efforts to address threats to the environment. The public seems to have taken their cues from leaders. For example, regarding the belief that "global warming has already begun" Democrats rose from 52 to 76 percent between 1997 and 2008 while Republicans dropped from 48 to 42 percent.

These gaps are were also present in related beliefs, with Democrats less likely than Republicans to believe that news about threats of global warming have been exaggerated (17% versus 59%), and *more* likely to believe that scientists agree on global warming threats (75% versus 54%), and that increase in Earth's temperature is human-caused (72% versus 40%). The authors cite scholarly opinions that such differences between Democrats and Republicans are driven primarily by party leaders. They also cite statistical data that confirm that the differences are due to party orientation and not due to gender, age, race, income or education.

The authors cite many organizations' condemnations of the G.W. Bush administration's opposition to constructively dealing with climate change threats as further support for political partisanship on this issue. They also cite "LCV scorecard"

data, which is a Congressperson's lifetime pro-environment voting percentage, with McCain at only 26% and Obama at 86%.

Regarding expectations from governments, a study employing focus groups in Lancashire county in England documented strong public concern for the environment but feelings of powerlessness as individual citizens and skepticism that government could be relied upon to take constructive action, being confined by bureaucratic self-interest (Macnaghten et al, 1995).

Gallup polling has documented international citizen concern over the threat of global warming, with the exception of Russia and China (Ray, 2009). The percentages of citizens who are very or somewhat concerned ranged from 63% in the European Union to 94% in Brazil. Russia was 47% and China only 33%. In the U.S., one of the world's largest contributors to greenhouse gases, the percentage was 64%.

A recent Pew poll finds political orientation underlying differences in which issues the President should deal with as "high priority". Many more Democrats and Independents than Republicans give high priority to protecting the environment in general (54% and 41% versus 20%), and dealing with global warming in particular (45 and 25% versus 16%).

Democrats and Independents are *less* likely than Republicans to give high priority to strengthening the military (38 and 41% versus 64%), dealing with illegal immigration (34 and 42% versus 46%), and dealing with “moral breakdown” (46 and 40% versus 50%).

Democrats and Independents seem more concerned with the common good, the welfare of all citizens, giving higher priority than do Republicans to improving education

(71 and 59% versus 46%), reducing health care costs (71 and 52% versus 45%), and dealing with the problems of the poor (62 and 48% versus 34%).

Thus, this polling data presents politically liberal citizens as more concerned with the welfare of the whole community by promoting kind and generous programs that benefit all citizens, while conservative citizens are characterized as more in-group protective, defending against threats from outsiders with military might and keeping wealth in the hands of those who have it. The kindness and generosity of liberals seems to extend beyond human interests of the present to concern for the environment itself, and, by implication, to concern for future generations.

This concern for the common good also seems reflected in data cited by Lorenzoni and Pidgeon (2006). In one study citizens did not feel they could effect climate change themselves. A study of British citizens found that many did not feel that their personal efforts could have much effect on climate change but 85% of them expressed willingness to change their lifestyles to help (Kirby, 2004). 68% were willing to use cars less. 62% would take fewer flights. 37% would pay more for gasoline. 60% thought the problems should be addressed at a global level, 13% at a national level, and only 9% at a household level. Thus, citizens seem to realize that climate problems are international in scope and require action at national and international levels.

In other studies cited by Lorenzoni and Pidgeon, citizens indicated that they think government, businesses and scientists should lead efforts to protect the world environment, though they tended to see these groups as avoiding such responsibility. Indeed, citizens trusted environmental organizations and scientists much more than governments and oil and car companies to take responsibility.

Evidence suggesting inaction by governments is reflected in CO^2 emission data. While some nations have achieved reductions in CO^2 emissions (Pielke, 2007), others have been increasing. For example, the largest emitter, the United States, has had an average increase of .8% per year since 1990 (Energy Information Administration, 2009). At this rate, rather than *falling*, U.S. emissions will *double* in the next 90 years.

While U.S. carbon emissions have dropped 9 percent in the past two years, some of this is due to the recession. Congress is considering legislation to reduce emissions by 15 or 20 percent by 2020, but Lester Brown, president of the Earth Policy Institute, recommends 80 percent (Brown, 2009).

Pielke presents opinions that there are significant impediments to progress on this issue internationally, including political resistance. In a 2006 National Journal Poll, he reports that 98% of Democrats in Congress believed it has been proven that global warming is human-caused, whereas only 23% of Republicans did. He suggests five specific government policies that could be enacted: mandatory limits on carbon dioxide emissions, increased investment in alternative fuels, greater reliance on nuclear energy, higher fuel-efficiency standards for cars, and a higher gasoline tax.

However, he predicts that “die hard partisans” (those from both parties who accept special interest group money via lobbyists?), will resist enacting such policies. Activists on the left may see both Democrat and Republican members of Congress as defenders of big business and the U.S. Military, which rely heavily on cheap energy, currently available only via fossil fuels. For example, New York Times columnist Paul Krugman opines: "...climate change is a problem that can only be addressed through

government action...hurting some powerful vested interests...and the industries of the past have armies of lobbyists in place...." (Krugman, 2009).

In a study by Greeley (1993) low levels of environmental concern were associated with religious beliefs characterized by “biblical literalism”, defining oneself as “Christian” and with confidence in the existence of God. In contrast, high concern for the environment, which was measured as willingness to spend money on the environment, was characterized by a “gracious image of God” and being Catholic. More specifically, biblical literalism was interpreted by the researcher as reflecting a rigid political and religious worldview.

In a study by Dunlap (1975) Democratic and Liberal-Left university students were more pro-environment in felt concern, attitudes and behavior than were Republicans and Conservatives.

Research has shown relationships between many psychological dimensions and sustainability attitudes, including political attitudes, religious beliefs, attitudes toward disadvantaged citizens, and military attitudes. Therefore, it behooves psychologists doing research to embrace a collaborative perspective, working with experts from other such disciplines. For example consider the opinions of experts from several different fields as expressed in their chapters in the 2006 book Global Survival (Laslo & Seidel, 2006).

Architect Peter Seidel (p. 3), advocate of a new discipline of “survival research” that was introduced by political scientist John Herz in 1988, says “We must understand the effect of our lifestyle on the world around us and learn how our minds, government, business, religion, and our evolutionary development interact.” Relevant fields suggested

include general systems theory, evolutionary psychology, sociobiology and ecological economics. He calls for interdisciplinary study and “superdisciplinary” study, inviting all social sciences to participate and urging all scientists to look beyond their traditional national, economic and religious interests.

John Herz himself refers to the G.W. Bush administration as waging war in Iraq as an expression of right wing fundamentalist religious doctrine based on “social Darwinist values and the related ideological claim to have the right to wage war wherever and whenever it serves the interest of the superpower to preserve its military and political power."

Engineer Walter Lowen offers the theoretical opinion that humans are motivated simply by self-interest and must be convinced to appreciate the dangers to the environment and species survival of an unchecked preoccupation in this direction. Jerome Barkow in chapter 5 of this volume, a cultural anthropologist, conceptualizes humans as driven by evolved ethnocentrism, a preoccupation with promoting the interests of the “in-group”, at times killing members of out-groups. In times of war, leaders capitalize on this trait. He hopes that humans can somehow counteract this disposition by understanding its evolutionary origins, referring to them as “Pleistocene” and ill-suited for survival of the species in today's world.

In chapter 6, James Alcock opines that we must change citizen beliefs to motivate them to take effective action. In this he seems unaware of the extensive psychological research data that shows very little permanent change in environmentally protective behaviors by educational attempts to change beliefs and attitudes. He thinks

governments must manage the problems with regulations, which may be more to the point.

In chapter 7, psychologist David Myers also puts the burden on the individual citizen, thinking that if we inform citizens that money and material things don't guarantee happiness they will be more willing to abstain from bearing as many children or acquiring as many material things and be more open to appreciating efforts to teach them the importance of more sustainable behaviors. He too seems unaware of the research that shows poor results of educational efforts to change behavior.

In chapter 8, philosopher Ervin Laszlo argues for a planetary ethic, a universally accepted moral code or principle to unite citizens in some sort of self-regulatory mechanism. He believes it has traditionally fallen upon religions to instill human ethics and bemoans the lack of a scientifically based universal ethic to inspire sustainable human behaviors. He cites the 1990 “Universal Declaration of Human Responsibility” created by 24 former heads of state. He also cites agreement with this code in 1993 by the Union of Concerned Scientists.

He considers this to be support for his belief that the key starting point to successful attention to sustainability issues is forming such an ethic, which will take effect by somehow inspiring or guiding “a great movement, convincing reluctant leaders and reluctant governments and reluctant peoples themselves to effect the needed changes.” He does not explain how he thinks this could actually happen and concedes at the end of his argument that in the final analysis these issues will be resolved not by teachers of philosophy or individual citizens but by political and government procedures, though perhaps exclusively within democratic societies.

In chapter 10 Richard Norgaard, an economist specializing in agriculture, urges an attempt to unite the insights of all sciences to guide formation of sustainable behaviors. He focuses on the conflicts between fossil fuel industries and the concerns of scientists and blames the greed and short-sightedness of human nature for the dilemma. He calls for building understanding across scientific disciplines to "see the whole picture."

In chapter 11, zoology professor Kenneth Watt urges scientists to be open to surprising and new ways of looking at things. Rather than the traditional research method of starting with theory to create experiments in a linear fashion, he suggests "concrete random thinking", emphasizing observing data and letting the data inspire new theories. He thinks this can be more creative than using our imaginations. Furthermore, and in a practical vein, he urges scientists to be surprising, present new ways of looking at things to catch the attention of mass publics. He also urges scientists to present arguments and data in such a way that the findings are irrefutable. We must also become more proficient at explaining our findings to citizens and to business and political leaders, and become very active in the political arena and with the media, he urges.

John Gowdy and a student of his, Andy Bohn, in chapter 12 explain that traditional economic theory is seriously deficient, as it fails to appreciate the limited resources in the environment and the threats of unchecked population growth and demand for energy and physical resources. They appeal to science to inspire economic theory more in tune with these sustainability issues and promoting conservation, decreased consumption and stable population levels. They assert that world leaders hold the environment in low priority, siding with pursuit of production, consumption and

economic wealth. In this context, one wonders how Gowdy and Bohn would view the effective lobbying in September of 2009 of President Obama, blocking his efforts at increasing regulation of the financial industry.

In chapter 13 professor of history J.R. McNeill opines that, paradoxically, environmental policy is made not by government departments of the environment (e.g. U.S. EPA), but by ministries of finance, industry, defense and agriculture, pursuing traditional courses that are contrary to environmental protection.

In chapter 14 Richard Lamm, Co-director of the Institute for Public Policy Studies, quotesThomas Sowell, who opines that a human ethic of economic growth may be genetic, a fundamental human urge to exploit the environment. Lamm faults the U.S. for blindly following four questionable preconceptions, including the religious belief that the U.S. has a divine destiny and that our political system and form of government are themselves sustainable and therefore beyond criticism. Our pursuit of economic and population growth as civic goods, are also beliefs in conflict with environmentally sustainable realities.

In this context, political scientists Levergood and Breybogle are quoted as explaining that our "political institutions ... are no longer able to restrain the worse within us." Success in U.S. politics depends on special interest group money received to fund campaigns. "Only a new party unencumbered by the past, can take the money out of politics or reduce its caustic influence", these authors assert. They predict that the necessary transition from growth to sustainability, if it is successful, will be "one of the great transitions of history", requiring adjustments in economic, religious, social and political systems, as they see them all as based on the "growth model".

In chapter 15, retired U.S. foreign service officer Lindsey Grant points out that U.S. presidents since Teddy Roosevelt a hundred years ago have called for commission reports on how to manage natural resources and plan population levels, but that all of these reports have been ignored by government.

In spite of this dismal history of political indifference to informed reports, in chapter 15 we read opinions by Christopher Williams at the British Centre for International Education and Research that what is needed are means for educating leaders. However, he despairs, quoting for example the self-serving religious and political ideology of one of the most prominent U.S. leaders, Joseph Nye, Jr., Harvard professor and a leading international relations scholar and American foreign policy spokesman, who unashamedly has maintained that the total destruction of the human race is preferable to an existence that does not preserve positive survival in the form of the American way of life.

The United Nations has been concerned about the environment for many decades as reflected in its initial Universal Declaration of Human Rights and subsequent more specific publications. The United States government has also been concerned as reflected in the establishment of the Environmental Protection Agency and in legislation directing cleanup of nuclear waste at places like the Hanford nuclear production facility and cleanup of underground fuel tanks at public gas stations and of asbestos from buildings. However the U. S. Congress has refused to ratify the Kyoto conference and cooperate with other similar international treaties mandating reduction of fossil fuel use.

In September of 2009 as this article was being written, a task force for the American Psychological Association published a report on how psychologists have and

should take up the challenges of global climate change (Swim, et al, 2009). The authors review the history of psychology as it relates to sustainable concerns, mentioning many of the psychological studies summarized above. They also review topics that are less directly related, such as studies on risk perception in decision-making and group affiliation differences in environmental attitudes (e.g. rancher versus environmental group attitudes).

While they document the enormity of the threats to the environment and the extremely high consumption of resources, and emission of greenhouse gasses by the U.S. relative to developing nations, they tend to focus on psychological research on individual citizen perceptions and habits driving consumption and population growth.

While they acknowledge that human population and consumption drive threats to sustainability, they tend not to ask questions about why government itself does not lead with regulations that would force reduction of fossil fuel burning and discourage population growth. They do not invite psychologists to address these more political dimensions of the issue, as do some members of the budding field of political psychology. They *do* reference one article by prominent political psychologist Jon Krosnik, head of the Stanford Summer Institute of Political Psychology, among other projects.

To their credit, the task force authors also call for study of values that underlie consumption and population decisions and they acknowledge that citizen "behavior options are shaped by ...various laws and regulations", clearly implicating governments. They cite data documenting widespread citizen concern for the environment, but report that if people don't thing they can control a problem, they usually don't act on it.

The task force also reports that citizens tend to do as their peers do. This implies that techniques such as serial public television programs inspired by Alfred Bandura's theory might effect constructive behavior changes, such as support for government policies, e.g. rationing of fossil fuel.

They cite studies documenting religious and spiritual beliefs that underlie citizen inaction, e.g. that God will not flood the earth again because the Bible says he won't, or that Mother Nature will do as She pleases. They also report that a small segment of Americans simply deny that global warming is occurring, and invite psychologists to study this. They bemoan citizen distrust of science and government. However, they do not directly invite psychologists to address bigger questions such as why governments themselves deny the issues and fail to take effective action to reduce fossil fuel consumption and the growth ideology underlying consumerism and population increase.

The task force *does* touch on government as a possible focus for study, reporting that "policy makers are increasingly...turning to behavioral scientists for better conceptual models and for advice on how to implement them...." (p. 138). Direct focus on the psychology of government itself would seem worthwhile, and indeed the task force authors end by encouraging acceptance of big challenges, stating that: "...in developing and describing psychological contributions to efforts to mitigate climate change, emphasis should be placed on changes that have large potential effects on emissions...in preference to changes that have smaller potential effects."

Thus, improving *government* resolve to deal with environmental threats would seem more important for psychologists than continuing efforts to change the behavior of individual citizens, which has proven to be very difficult.

Finally, the task force makes various recommendations to psychologists, including collaboration with other disciplines. They refer to ethical principles of psychologists, for example, using them as grounds for encouraging psychologists to address sustainable issues as an expression of their professional and scientific responsibility for society.

In summary of this background literature, it is clear that the majority of citizens is concerned about the environment and seems willing to cooperate with efforts to protect it. Political and religious beliefs seem related to environmental attitudes, with Conservatives and Religious fundamentalists more opposed to protecting the environment than Liberals and Democrats. Opinions from other disciplines emphasize the dangers to the environment of economic and governmental ideologies based on endless growth in consumption and population and point to special interests benefiting from the wealth and power of fossil fuel use. Citizens tend to look to political leadership and government to lead efforts to deal constructively with global environmental issues. Citizen attitudes tend to follow those of political party leaders.

Therefore, it seems clear that attempts to change individual citizens without working through social and governmental mechanisms are unlikely to bring rapid enough change to significantly address the enormous challenges of creating a sustainable planet.

Method.

The studies reported by the author below may offer some new perspectives for psychologists to address the threats to our environment. These studies explore sustainability endorsement primarily with the research method espoused above by

zoologist Kenneth Watt, emphasizing observation of data. The studies were inspired not by prior theory so much as by curiosity about many related psychological traits, beginning in 2003 with an effort to measure the Eidelson worldviews (Eidelson & Eidelson, 2003).

This initial effort included measures of several other traits for validity purposes, initially to test the Eidelson hypothesis that their worldviews may underlie international conflict.

The researcher created questionnaire measures of traits and let the observed findings of each study inspire additional studies. Some of these studies included traits from prior researchers, such as the Religious Fundamentalism and Right Wing Authoritarianism of Bob Altemeyer (Hunsberger, 1996), Social Dominance Orientation of Jim Sidaneus and Felicity Pratto (Pratto, 1994), and measures of "isms" by Gerard Saucier (2000). The most frequently replicated studies included numerous traits defined by measurements developed by the author ("Author", 2006), including measures of religious fundamentalism, kindly religious beliefs, human rights endorsement, endorsement of authoritarianism, violence-proneness, warmongering endorsement and endorsement of terrorism.

Early in this process, measures of sustainability endorsement and endorsement of human rights were drafted by the author. The second of these included 16 items, based on the Earth Charter.

Procedure and Participants

These studies were initially conducted using paper and pencil questionnaires administered to church groups, college and university students, business executives and others, but in recent years have been done electronically, via questionnaires offered over the Internet at the author's non-profit corporation web site, Politicalpsychologyresearch.com. Recent studies have been completed by community college students. Data is saved to file, downloaded, and analyzed by an SPSS statistical program. The college student participants immediately receive a printout of their scores on the traits measured in the study and also receive a written summary of the overall study findings before the end of the current college course term, so they can learn from the experience. They receive credit in their courses for participating in the studies. The courses are psychology classes taught by a colleague of the author. The typical study questionnaire has well over 100 items measuring several traits reliably. The items are presented in Likert scale format, usually with five options: strongly disagree to strongly agree.

Two different scales of traits or attitudes related to ecology, broadly defined, have been included in various clusters of studies. The first scale measures desires for national government policies and programs protecting the environment. The second is phrased in terms of desired general citizen behavior and is modeled after the Earth Charter, an international charter about protecting the environment.

The series of studies yielded data that is reviewed in the present article from the perspective of the relationship between endorsement of sustainable policies and programs and the many other traits.

Results.

The first of the environment concern measures, phrased in terms of desired government policy, was the Sustainablility Endorsement Scale, which measures concern for the social as well as physical environment. It is presented in Figure 1.

(Insert Figure 1 about here.)

On a sample of 383 adults from many studies the minimum score was 45, maximum 60, mean 45.0 and standard deviation 7.5. The Cronbach Alpha reliability coefficient was .76, which is rather modest, but proved to be high enough to reveal substantial correlations between this measure and other traits. The subjects were from college and university classes, churches, a business executive association and other groups, ranging in age mainly from 18 to 86, mean 29.7, standard deviation 15. 45% were males. The sample had a mean education of 14.3 years, and standard deviation of. 2.9 years. The subjects included many from outside the United States, including Nigerians in Nigeria and many foreign university students at the University of Oregon.

The relationships between the traits were virtually the same in all of these studies, so the results from all of the studies combined are representative. Validity data for this first scale on the sample of 383 is presented in Table 1. All of the scales listed in this table are presented in detail in a manual on the author's web site ("Author", 2009).

(Insert Table 1 about here.)

We see in Table 1 substantial relationships between desired government policies promoting sustainability and attitudes about other important political issues. As validity data was similar across all groups in this study, including subjects from many nations, this may mean that what is being measured by the various scales are rather fundamental human dispositions. Endorsement of sustainable policies and programs seems to reflect a

"pro-social" disposition, as it correlates positively with preference for more democratic forms of government, especially government that serves the common good rather than special interest groups. Endorsement of sustainable policies correlates negatively with endorsement of warmongering and traditionally more dangerous forms of government, such as military dictatorship.

It also correlates positively with the Big Five personality traits of Agreeableness, Emotional Stability and Openness, all of which tend to reflect pro-social dispositions, as these three Big Five traits correlate negatively with measures of criminality and all of the Big Five correlate positively with enjoying various work behaviors.

Factor analysis of the data in this sample of 383 persons also documents this relationship between sustainability endorsement and the pro-social traits. When a single factor is extracted, the factor has positive loadings on the Eidelson Worldviews (Superiority .73, Injustice .61, Vulerability .64, Distrust .77, Helplessness .81), and Warmongering Endorsement (.81), and negative loadings on Sustainability Endorsement (-.75), endorsement of Public Democracy serving the common good (-.73), and Big Five Agreeableness (-.45) and Emotional Stability (-.38). Thus, Sustainability is positively associated psychologically with pro-social traits rather than anti-social, anti-culture traits.

The second measure of ecologically relevant attitudes was a 16-item scale measuring desired general citizen attitudes about the environment, which may be referred to as the Ecology Endorsement Scale. This scale was included in a series of studies focusing on religious beliefs and human rights. The scale is presented in Figure 2.

(Insert Figure 2 about here.)

In a sample of 115 adults, 68 parishioners from two mainstream protestant churches and 47 students from a local community, this scale has a Cronbach Alpha reliability of .92. All of the items in the scale correlate at the .01 or better significance level with the total score made up of all the items, indicating that they are all features of this trait as measured. Examination of the item content reveals attitudes of a comprehensive concern for both the physical and social environment. The items reflect desires for a stable, civil and sustainable social world, as well as a world protected from degradation of the physical environment. This scale also appears to be pro-social, as reflected in the validity data presented in Table 2.

(Insert Table 2 about here.)

As in the first study presented above, endorsement of a protected and constructive environment appears to be substantially related to other politically important traits: endorsement of a positive and helpful foreign policy, endorsement of human rights, and endorsement of increased direct citizen participation in government decisions.

Ecology attitudes are also substantially related to basic religious beliefs, with fundamentalists opposing concern for environmental protection and those of the kindly beliefs orientation supporting it.

Ecology concern does not appear to be strongly related to the Big Five personality traits in this study.

Endorsement of a positive ecology appears unrelated to either education or verbal intelligence in this study. This suggests that attitudes about the environment and about ecology in general may not be very malleable. Approaches other than education may have to lead successful efforts to protect the environment from catastrophic degradation.

This data may help explain the very limited success of psychologists' efforts to change ecologically protective behavior by educational means, as reviewed in the introduction to this article, above.

Factor analysis of a sample of 42 community college students who completed three questionnaires measuring sustainability endorsement and many other traits again showed sustainability associated with pro-social traits ("Author", 2007). When a single factor was extracted, the positive loadings were on Sustainability Endorsement (.72), Positive Foreign Policy Endorsement (.70), Human Rights Endorsement (.83), Endorsement of Public Democracy serving the common good (.54), Desire for Improved Government Services (.69) and Endorsement of Kindly Religious Beliefs (.71).

In contrast, the negative loadings for this factor were on Warmongering Endorsement (-.83), Violence Proneness (-.80), Terrorism Endorsement (-.72), Authoritarianism Endorsement (-.57), and Religious Fundamentalism (-.51). Thus, again, as in the first factor analysis summarized above, sustainability endorsement is clearly associated with a diverse cluster of pro-social, pro-cultural psychological attitudes.

Frequency Data.

How many people endorse sustainable policies and programs? One way to measure this is to calculate the percentage of questionnaire subjects who endorse five-option Likert scale items at the Agree or Strongly agree level.

In the studies above, the mean item score is computed for each scale. As the middle of this scale is Neutral and valued at 3, one can use a cutoff of 3.5 as the level above which persons can be assumed to be "for" the trait measured. For example, in a

government referendum issue put to voters, one must choose either "For" or "Against", there is no "Maybe" option on the ballot.

Frequency data for a sample of traits in the first two studies above is presented in Table 3.

(Insert Table 3 about here.)

This frequency data suggests that by far the majority of citizens support sustainable policies and programs and have deep respect for the environment. These findings are compatible with those of national polls summarized above and with one reported recently: "Nearly two out of three American adults see global warming as a very serious problem that threatens future generations…." (APA Monitor, 2008b).

Endorsing sustainable attitudes appears to be a pro-social disposition, as the majority of citizens also appear to endorse democracy serving the common good, direct participation of citizens in government decisions, human rights, a peaceful foreign policy and kindly religious beliefs. Small minorities of citizens feel socially disenfranchised and endorse fundamentalist religious beliefs and warmongering. In other studies by the author, typically 6% have endorsed religious fundamentalism, 6% warmongering, and 89% kindly religious beliefs.

This frequency data is encouraging in the sense that it seems to indicate that a strong majority of citizens desire sustainable policies and programs and have deep and comprehensive respect for the environment. As sustainable attitudes seem relatively unrelated to education and intelligence, the job for social activists need not be so much one of teaching people the importance of sustainability and protection of the environment. The majority of people already hold such attitudes.

Discussion

Citizen concern for the environment appears to be intimately interwoven with political attitudes, religious beliefs and attitudes about human rights and even with personality traits. Understanding these complex relationships can enlighten thinking about government activity and planning. The implications for government planning are important, especially in today's political climate of serious problems on many topics, such as religiously colored political campaigns, special interest group control of legislative decisions through lobbyists in the United States, and international problems with terrorism, militarism and warmongering.

Two different basic religious orientations tend to be pro-social (Kindly Religious Beliefs) and anti-social (Fundamentalist Beliefs) respectively. Thus, to the extent that religion is allowed to directly influence politics, a nation would seem to be at greater risk for war if fundamentalism predominates. If kindly religious beliefs predominate, peace would seem more likely. Authoritarianism is also directly associated with warmongering and related anti-social traits. To the extent that authoritarian leaders gain control of governments, nations will seem at greater risk for conflict. And, because sustainability attitudes are related to these other attitudes, the fates of sustainable and ecological concerns also hang in the balance.

The present data suggest that citizen concern for the environment is widespread, consistent with repeated national poll data. The majority of citizens are concerned for the environment. And the majority of citizens are pro-social, endorsing human rights, a positive foreign policy and eschewing warmongering. The majority also prefers

government that serves them as members of the community overall rather than as members of special interest groups.

Therefore, it would seem unnecessary to emphasize education of the public on the importance of environmental issues. Rather, the need seems to focus on transforming governments to a form that is not controlled by special interest groups bent on using fossil fuels and other resources for unlimited in-group power and profit.

In this context, the author has found recent theory by biologist Randy Thornhill of particular interest (Thornhill, Fincher & Aran, 2008). Thornhill and his colleagues have found higher frequencies of religions, languages, authoritarian governments and warring behavior the closer a territory is to the equator. Disease pathogens are also most frequent near the equator.

They theorize that the conservative worldview has evolved in the human species to serve an important species-promotion function. The function is based on fear and avoidance of out-groups to protect in-groups from neighboring disease pathogens against which the local group lacks immunity, just as Native Americans lacked immunity to European pathogens that were primarily responsible for their die-out with immigration of Europeans to the Americas.

It seems reasonable to extend this theory to explain the liberal worldview as also evolving in the human species to promote a complementary benefit to in-groups. The benefit liberals have provided comes from promoting trust of and gradual interaction with neighboring groups to garner advantageous genetic variation from them and eventually inheriting from them immunity to their territory's pathogens. This interaction also yields benefits by exchanging knowledge and technologies, and by trading foods, minerals and

other goods. Thus, early human groups that had representatives of both of these worldviews or political orientations had survival advantages over groups that did not.

The clusters of traits revealed by factor analyses presented above strike the present author as evidence for two fundamental, alternate human worldviews, one that underlies Thornhill's conservative, militaristic in-group *protection* function and the another that underlies a liberal, in-group *promotion* function characterized by trusting and cooperative trading with other groups and nations.

If these two orientations are confirmed, the challenge for modern civilization will be to find ways to channel human political orientations (conservative and liberal in particular) constructively, in ways that complement rather than oppose and frustrate each other. The challenges created by rapid population growth, pressure on resources and resulting threats to our environment require maximum cooperation between peoples of all political orientations.

To this end, the author has created a model, based on psychological research findings, for a new form of political party designed to promote a transition to a more advanced form of democracy, one promoting the common good ("Author", 2006). He has also developed ideas for institutes to help communities design sustainable systems, delineated in a grant proposal to the George Soros Open Society Fellowship foundation.

The present ecology attitude studies have been, in effect, pilot studies. While the samples of persons has been large enough to obtain reliable measures and diverse across several nationalities, data on large random samples of adults will permit more confident generalizations to larger populations.

The author is eager to collaborate with other researchers who want to replicate the author's studies and do new ones.

Further research and informed response to global climate threats deserve our continuing conscientious efforts. We will prevail as a species only if we find ways to empower and energize the better angels of our political natures.

Addendum: Examples of hypothetical additional measures.

The two scales presented above are phrased in terms of expectations of one's national government and of general ethical principles, respectively. There are other ways such scales can be focused, which might reveal additional insights. Scales could ask citizens what specific actions they would be willing to take to facilitate sustainable communities, or what actions they are taking at present. Items reflecting these two orientations are presented in Table 4 as food for thought for researchers who might be interested in pursuing further studies.

(Insert Table 4 about here.)

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Figure 1. Sustainability Endorsement Scale.

Please indicate how strongly you agree with each of the statements below using this code:

Strongly Disagree	Disagree	Neutral or between 2 and 4	Agree	Strongly agree
1	2	3	4	5

My national government should support...

1. ...international treaties and efforts to reduce greenhouse gasses and global warming.

2. ...international treaties and efforts to reduce nuclear weapons and missiles that deliver them.

3. ...the United Nations with money and cooperation.

4. ...replacement of gasoline and diesel fuels with non-polluting fuels.

5. ...replacement of gas and coal-fired generators with non-polluting nuclear and solar generators.

6. ...restriction of harvesting from forests and fisheries to levels that are sustainable for generations (forever).

7. ...use of prime agricultural land for agricultural use only (forever).

8. ...restriction of use of fresh water resources (rivers and wells) to sustainable levels (forever).

9. ...development of reasonable population limits and helping communities maintain them.

10. ...a national health care system that provides basic, affordable care.

11. ...local community rights to restrict the broadcasting or marketing of products that have been shown by research to promote violent thinking and behavior.

12. ...local community rights to restrict the marketing or broadcasting of products that have been shown by research to promote criminal sexual behavior.

Figure 2. Ecology Endorsement Scale.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

1. All beings are interdependent and every form of life has value regardless of its current worth to human beings.

2. Everyone has the duty to prevent environmental harm.

3. With increased freedom, knowledge and power comes increased responsibility to promote the common good.

4. We should adopt at all levels sustainable development plans and regulations that take into consideration environmental conservation and rehabilitation.

5. We should manage the use of renewable resources, such as water, soil, forests and marine life, in ways that do not exceed rates of regeneration and that protect the health of ecosystems.

6. We should carefully conserve and manage our extraction and use of non-renewable resources, such as fossil fuels and minerals.

7. We should prevent and minimize pollution in any part of the environment.

8. We should reduce, recycle and reuse materials used in production and consumption.

9. We should promote the active participation of women in all aspects of economic, political, civil, social and cultural life.

10. We should affirm the right of indigenous (native) peoples to their spirituality, knowledge, lands and resources and to their related practices of sustainable livelihoods.

11. We should promote local, regional and global civil society, and promote the meaningful participation of all interested individuals and organizations in decision making at the local, regional and global level.

12. We should encourage and support mutual understanding, solidarity and cooperation among all peoples and within and among nations.

13. We should implement comprehensive strategies to prevent violent conflict and use collaborative problem solving to manage and resolve environmental conflicts and other disputes.

14. We should demilitarize national security systems to the level of a non-provocative defense posture and dedicate money saved to constructive uses, such as restoring damaged environments or national health care systems.

15. We should eliminate nuclear, biological and toxic weapons and other weapons of mass destruction.

16. We should strive for a sustainable global community, honoring the efforts of the United Nations and supporting appropriate international treaties.

Table 1. Pearson product moment correlations between Sustainability Endorsement Scale and other scale measures. Sample size 383.

Scale.	Sample item	r
1. Endorsement of public democracy government model	Public democracy. Elected officials run the government to serve the current and long-term best interests of the community overall, including sustainable programs such as conservation of resources and control of pollution and global warming. No one special interest group or groups are favored."	.43**
2. Endorsement of more democratic forms of government	Five item scale, including the item above and ones measuring endorsement of anarchy, monarchy, military dictatorships, and special interest group democracy.	.54**
3. Warmongering endorsement.	Measured with a scale of 20 items such as "War is a noble and glorious activity."	-.69**
4. Social disenfranchisement	This 80-item scale measures the 5 facets of the Eidelson worldviews: Injustice, Helplessness, Vulnerability, Distrust, and Superiority at both individual and group levels.	-.62**
5. Endorsement of anarchy	One of the five items in the second scale above.	-.37**
6. Endorsement of	One of the five items in the second scale above.	-.48**

military dictatorship		
7. Endorsement of tribal democracy.	One of the five items in the second scale above: "Tribal democracy. Elected officials run the government to serve the short-term economic interests of the special interest groups ("economic tribes") that helped them get elected.	-.29**
8. Big Five Extroversion	Measured by a single scale item in Likert format.	.09
9. Agreeableness	"	.35**
10. Conscientiousness	"	-.03
11. Emotional stability	"	.23**
12. Openness	"	.11*

Table 2. Pearson Product Moment Correlations between Ecology Endorsement and Other Attitudes. N = 115 except for the Big Five traits, which are based on an N of 34 college students from a separate study.

Trait	Trait description	r
Age		.24*
Gender		-.04
Years of education		.01
Warmongering endorsement	A 31-item scale with content such as "My national government should do whatever best serves our nation's interests, at the expense of other nations, enforced by military action if necessary."	-.60**
Positive foreign policy endorsement.	A 12-item scale with content such as "In foreign policy, our nation should help other nations with peaceful means rather than military ones."	.65**
Human Rights Endorsement (less 16 items from the Earth Charter)	28-item scale modeled after the U.N. Universal Charter of Human rights and the Universal Declaration of Human Rights by the World Religions (Christian), with items such as "Everyone is equal before the law and entitled to equal protection before the law."	.72**
Kindly Religious Beliefs	13-item scale with content measuring one of two religious beliefs factors. Items such as "Any	.54**

	specific personal religious beliefs are appropriate and acceptable as long as they respect human dignity and welfare."	
Religious Fundamentalism	18-item scale measuring the second of two basic factors. Content such as "There is only one true god (or God) that all people of the world should worship."	-.50**
Verbal Intelligence	12-item scale with items such as "Viruses are larger than bacteria" and "The Empire State Building is in the capital of New York."	-.03
Citizen participation in government.	5-item scale with content such as "The government should encourage citizens to be informed and participating in government decision-making...."	.46**
Big Five Agreeableness	Single item scale with five levels of endorsement.	.01
Extroversion	"	.10
Conscientiousness	"	-.01
Emotional stability	"	.01
Openness	"	.28

Table 3. Frequency data of persons endorsing traits.

Study	Sample size	Trait	Percentage with mean item score of 3.5 or higher (Agree or Strongly Agree)
#1	383	Sustainability endorsement	65%
		More democratic forms of government endorsement	67%
		Endorsement of public democratic government (serving the common good, not special interest groups)	82%
		Warmongering endorsement	5%
		Social disenfranchisement, individual level (Eidelson).	1%
		Social disenfranchisement, group level (Eidelson).	< 1%
#2	115	Ecology endorsement	98%
		Citizen direct participation in government decisions	81%
		Human rights endorsement	98%
		Peaceful, helpful foreign policy endorsement	88%
		Kindly religious beliefs	98%
		Religious fundamentalism	0%

		Warmongering endorsement	3%

Table 4. Sample questionnaire items assessing current and willing sustainable behaviors.

Current:

1. I recycle cans, bottles, newspapers and cardboard rather than throw them in the garbage.
2. I deliberately substitute florescent light bulbs for at least some of my prior incandescent bulbs.
3. I cluster my errands to reduce the number of trips I have to make per week.
4. I turn the heat down in my dwelling at night.
5. I turn the heat down in rooms I'm not using in my dwelling.
6. I use canvas bags for my groceries to avoid wasting paper or plastic bags.
7. I save and reuse empty cans, bags and other things.
8. I have limited, or plan to limit, the number of children I will bear to help limit world population growth.

Willing:

Assume that your national government was designing a program to promote more sustainable programs. Please indicate your attitudes about sustainable behaviors by indicating how strongly you agree or disagree with the statements below, using this code (5-option Likert scale):

1. I would be willing to reduce my use of private transportation by 10% to live within fuel rationing enacted by my national government.
2. I would be willing to reduce my consumption of beef to help reduce the amount of methane released into the environment.

3. I would be willing to pay $3.50 per gallon for hydrogen fuel instead of $3.00 per gallon for gasoline to help reduce the amount of carbon dioxide and other gases that increase global warming.

4. I would be willing to reduce by 10% my use of water for cooking, laundry, watering, etc. to help conserve it.

5. I would be willing to reduce my use of electricity by 10% to help save energy as part of a national program.

6. To help conserve energy as part of a national program, I would be willing to wear warmer clothes and turn the heat down to 70 degrees in my dwelling during winter months.

7. I would be willing to reduce the frequency with which I purchase a new vehicle or take long trips to help reduce my consumption of natural fossil fuels.

8. I would be willing to reduce my food consumption by 10 per cent to help save resources.