Empirical Taxonomy of Environmental Ethical Archetypes

By

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Abstract

Economists usually assume that the private ethical system of individuals is Utilitarian. However, one finds a much broader range of ethical positions in the environmental ethics literature. Moreover, environmental policy debates seem to elicit alternative ethical systems. It would therefore seem prudent to increase our understanding of the role played by alternative environmental ethical systems. In this study we follow some descriptive ethical studies in examining the empirical ethical positions of people based on a broad cross section of the American public. We review some taxonomic literature in environmental ethics and develop a conceptual model of the formation of environmental values. We then use canonical correlation to investigate the existence of environmental values and their relationship to childhood experience. We find four ethical systems linked to four different "types" of people. One of the ethical systems is decidedly spiritual and one seems rather ill-defined or indifferent towards nature. The other two systems show anthropocentric values, one more conservation minded, one more use minded.

Introduction

Neoclassical environmental economists usually assume that individuals are self-absorbed and utility-maximizing -- making decisions based on stable, preexisting preferences with full knowledge of the choices available (Bromley and Paavola, 2002). In most standard economic analysis, the positive rational actor (hedonic-utilitarian psychological) model of micro-economics assumes that each agent's private ethical system is Utilitarian. This is usually complimented with a Utilitarian social ethics – as manifested in Benefit-Cost Analysis and related applied welfare economics.

In contrast, the environmental ethics literature suggests that there is a broader ethical basis for human behaviour and policy-making regarding natural resources. Although these ethical positions are not commonly found in neoclassical economic analysis, widespread and multiple ethical positions appear in the political arena. This pluralism of environmental ethical positions may well be one of the root causes of the

diversity of public land management schemes found in the United States (Stenmark, 2002). Consider the uses to which U.S. public lands have been dedicated, including: forestry, grazing, outdoor recreation, and wilderness. Among these, forestry may be seen as a manifestation of an ethical view that puts present human well-being in the center, whereas setting aside designated wilderness areas may be a manifestation of ethical positions that put future generations or a community of all living things at the center (Minteer and Manning, 1999). In this view, collective action generally, and environmental policy specifically, cannot always be explained using traditional Utilitarian economic approaches (Bromley and Paavola, 2002). Some choices could be seen as non-economic (i.e., non-efficiency) moral issues. All the same, one must not be too quick to dismiss the Utilitarian-efficiency view. By extending Utilitarian concerns to succeeding generations and to "existence" and "bequest" values, the economic (Utilitarian-efficiency) realm can be expanded. Tools such as contingent valuation can operationalize this extended view. Finally, one should not ignore the possibility that some moral choices may be both uninformed and ill founded. Individual agents, and consequently society in aggregate, may make moral-policy decisions with insufficient understanding of the real world processes and with inconsistent and ad hoc moral principles.

In this article we will investigate some aspects of the empirical ethical positions found in the public. This paper is a study in descriptive as opposed to formal, normative ethics. The purpose is to help understand what ethical systems actually exist among the public as opposed to a formal development of an ideal ethical system or an application of such a formal system to environmental problems. However, we will spend some time

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clarifying ethical and related terms. Also, we will present a model of value formation

with the intent of contributing to an understanding of how environmental value systems

are generated in agents. In the empirical portion of the paper, we will use evidence from

a survey and employ a multivariate statistical analysis to address the kinds of

environmental ethical positions found in elements of the public. We will also present

some evidence regarding the factors that may lead to different ethical positions regarding

nature and the environment.

Ethical systems

The environmental ethics literature contains a variety of contending ethical

systems (see, for example, Wenz or Schmidtz and Willot). Much of the environmental

ethics literature comprises advocacy for a particular, monistic ethical system. Other parts

of the literature comprise analysis of policy issues from some monistic ethical point of

view (Minteer and Manning, 1999). Minteer and Manning observe that, in the real world,

people express a great diversity of opinions regarding the management of natural

resources and that this diversity is, in part, founded on diversity in ethical beliefs. While

some authors argue that a consensus environmental policy can emerge even from a

diversity of ethical beliefs, others argue that a fundamental diversity of environmental

ethical systems must lead to disagreements about proper policy (Stenmark, 2002). The

premise of this article is that an understanding of the empirical plurality of ethical

systems is an important prerequisite to clarifying and advancing discussions of

environmental policy.

A perusal of the table of contents of some texts and readers in environmental

ethics reveals a bewildering array of terms and categories: Utilitarianism, Contracts,

Natural Rights, Animal Rights, Anthropocentrism, Biocentrism, Ecocentrism, Land Ethic, Stewardship, Speciesism, Moral Obligations, and so on. We begin with some taxonomic and concept clarification to help organize this material and assist us in the interpretation of our empirical studies. Before we propose an explicit taxonomy, it will be useful to attempt a clarification of several key concepts, including the concept of intrinsic values and the concept of anthropocentrism.

The term *intrinsic value* appears frequently in the environmental ethics literature and in environmental policy debates. An initial, obvious and simple definition would be that an intrinsic value is a value that inheres in the object (target) of the discussion. An intrinsic value is therefore distinct for a value that is derived from or created by the observer. However, the term is more complex than this straightforward definition. The problem is that a value attribute is non-material. One cannot empirically measure the value of item X, independent of the observations of a valuing entity (or entities) as one can do with attributes like mass, volume and color (reflected spectrum). Therefore, if one is a strict materialist, the concept of an intrinsic value is a non-starter, an oxymoron. We shall call this definition of intrinsic value, that is, a value that inheres in an object independent of any observer, the strong intrinsic value concept. It can be supported only if one believes that value attributes are part of a deeper non-material reality. In other words, if one is a spiritual or platonic idealist or a dualist, one can believe in objective, intrinsic values independent of any observer.

Often, however, in environmental policy and ethical discussions intrinsic value is taken to mean a subtler concept (see, e.g., Schmidtz and Willot, Introduction, 2002). In this view, an intrinsic value is one that is not contingent on, or derived from, it's utility to

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the valuing entity.   We shall call this weak (or pragmatic) intrinsic value (the pragmatists

-- Pierce, Dewey -- believed that value attribution was a relationship among a community

of observers and the object observed). Here value requires an observer to be made

manifest, but the value of the item inheres in the attributes of the item -- the logic of

value is not dependent on the state of the observer relative to the item. In economic

terms, the observer is weakly complementary to the value of the object: existence of

some observer is necessary to existence of value, but the quality of the value is a function

of the attributes of the object, not the observer. This subtler concept of *weak intrinsic

value* is compatible with a materialist metaphysics.

A related issue concerns the term anthropocentric. Many environmentalists

complain that the policy and moral positions of others are anthropocentric -- that they are

concerned only with human preferences, not with the *intrinsic* value of nature. It follows

from use of the term, intrinsic, in this definition that the term, anthropocentrism, can be

defined several ways. If one believed that value attributes are subjective, depending on

the values of the observer, and you believe that only humans are capable of making moral

judgments, then, in a trivial way, all ethical values are anthropocentric. Again the issue is

more complicated. We will just make a few quick notes. One definition would make

anthropocentric the inverse of a weak intrinsic value. Moral values related to a human

observer's "utility" for an object are anthropocentric, whereas moral values which inhere

in the character of the object, though they may only be manifest when an observer is

present, are "intrinsic."

However, often, the term anthropocentric is used in connection with a discussion

about which entities have moral standing. Thus, if only beings with moral sense have

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moral standing, and only humans have moral sense, than all values are anthropocentric – by definition. However, one might argue that other, non-human entities have moral sense or more directly, that they have moral standing. For instance, one might argue that any conscious creature has moral sense and that there exist some non-human conscious creatures (e.g., chimpanzees). Another line of argument is that some entities possess moral standing even if they do not have moral sense. Thus, beings with moral sense may have moral obligations to other entities. Such entities might include other species or they might include such communities or networks of beings such as an ecosystem. Perhaps even non-living objects such as significant art objects or unique geological formations have moral standing. There are many gradations and complexities to the topic of moral standing and it leads us way beyond the scope of the present paper. However, the topic of moral standing and anthropocentricism also leads us directly to a discussion of taxonomy of environmental ethical positions.

Several taxonomies of ethical positions regarding the environment are formulated (explicitly or implicitly) in the environmental ethics literature and we shall briefly discuss two. The categories of environmentally ethical positions described by Stenmark (2002) and Minteer and Manning (1999) will be useful when we attempt to answer whether ethical categories actually exist in public view of nature and if so, what the categories might be.

Stenmark (2002) defined and described four general ethical positions regarding the environment that differ in their emphasis on the importance of human versus environmental existence. '*Traditional anthropocentrism*' is defined as the view that "people's behavior toward nature should be evaluated on the basis of how they affect

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now living human beings." The view Stenmark (2002) calls '*intergenerational anthropocentrism*' extends traditional anthropocentrism to include future generations of humans. Both these views put human well-being in the center, only humans have moral standing. According to Stenmark, '*Biocentrism*' is the view that "people's behavior toward nature should be evaluated on the basis of how they affect living beings," where 'living beings' include humans and animals. In this view, individual non-human organisms can have moral standing. This view does not specifically consider species (as a whole) and ecosystems. However, the view that Stenmark (2002) calls, '*Ecocentrism*' (or the land ethic[3]) does. Some scholars make a similar distinction, but use different terminology -- like individualistic versus holistic biocentrism.

Minteer and Manning (1999) (M&M) define a different taxonomy. What is especially interesting for our case is that the M&M taxonomy is explicitly linked to a descriptive ethics project similar to that of the current paper. Minteer and Manning (1999) M&M use five main categories for environmental ethical sentiment, and they define a total of 17 subcategories (names of subgroups are presented in brackets below). The main categories and subgroups are all part of what they call a pluralistic typology of environmental ethics. M&M's taxonomy is interesting in that it incorporates a continuum from anthropocentric to eco-centric (to use Stenmark's terminology) as well as an overlay of additional metaphysical, emotional and factual assumptions. Thus, fear of nature and beliefs about natural abundance are part of the taxonomy. Table 1 reproduces the M&M table with some alterations by the current authors, partly informed by Stenmark's typology.

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[3] Term first introduced by Aldo Leopold in 1949 in his essay "The Land Ethic"

According to Minteer and Manning, the '*Anti-Environment*' position may manifest itself in views that "nature can be dangerous to human survival" (Physical Threat) or "nature can be spiritually evil" (Spiritually Evil). The '*Benign Indifference*' positions put humans in centre, because humans are considered superior to nature either through creation (Religious Dualism) or by their intelligence (Intellectual Dualism). In this view, nature is a cornucopia of raw materials needed for humans (Storehouse of Raw Materials). We will term this the '*Human Dominion*' position. The views that Minteer and Manning describe as '*Utilitarian Conservation*' includes a variety of anthropocentric positions that are concerned mainly with the wise use of nature to meet human needs. Sub-categories include: Efficiency, Ecological Survival, Quality of Life, and Old (human dignity) Humanitarianism. On the whole, these first three M&M categories are anthropocentric in Stenmark's taxonomy. In the M&M taxonomy, the '*Stewardship*' views expand the notion of which entities have moral standing; they are non-anthropocentric in this sense. In the stewardship views humans have a duty to take care of nature. This duty to nature can be justified by supernatural obligations (Religious/Spiritual Duty, God's Creation, Life-Based/Mysticism sub-categories). With the exception of the Future Generations sub-category, these are biocentric or ecocentric views in Stenmark's terminology. The 'Future Generations' sub-group might have been better placed in the *Utilitarian-Conservation* category. M&M's fifth category '*Radical Environmentalism*' includes holistic views – what Stenmark would call ecocentrism – although the line between biocentrism and ecocentrism is not clear in M&M. Sub-categories include: Organicism/Animism, Pantheism, (non-human) Natural Rights and (Moral Rights) Humanitarianism. Moral Rights Humanitarianism is distinguished from

Old (human dignity) Humanitarianism in that it assumes that all living beings have some moral rights whereas Old Humanitarianism is based on the idea that animal cruelty diminishes the human perpetrator's humanity and is therefore more anthropocentric.
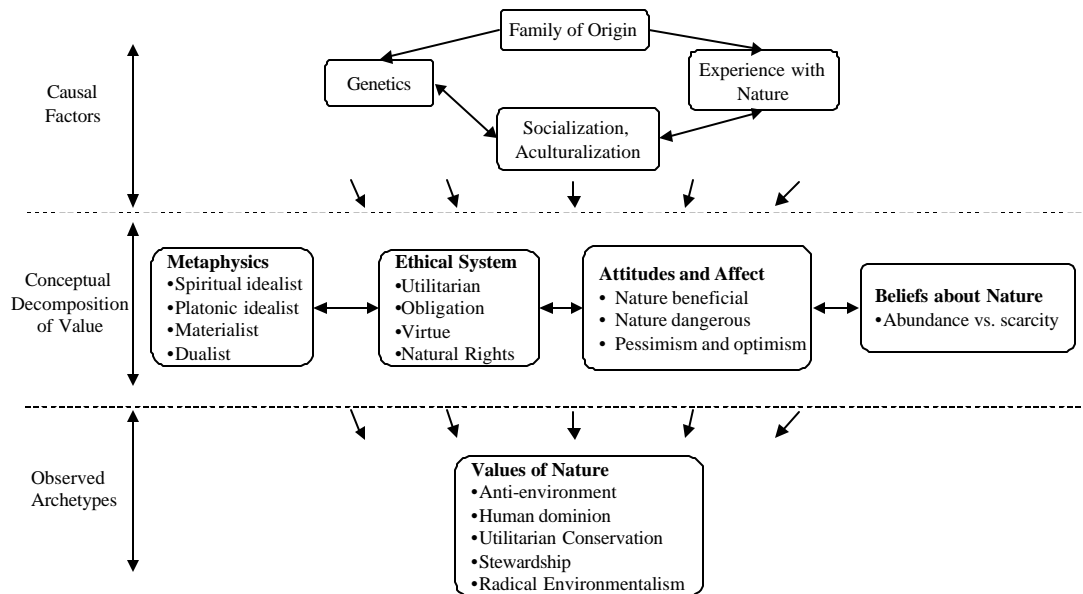
Minteer and Manning use survey data to show that a variety of these ethical positions have strong support in society. In this paper we also investigate the empirical existence of ethical positions, though our categories will not exactly coincide with those of M&M. Also, we extend the analysis by Minteer and Manning (1999) by focusing on some additional questions. More specifically, we attempt to determine how these empirical ethical categories relate to earlier life experiences and background.

On the Generation and Structure of Environmental Values

M&M provide a useful starting point for categorizing empirical environmental ethical systems. That is one of the chief goals of this paper. However, another goal is to investigate factors that can explain these ethical views. In this section we shall introduce a simple conceptual framework concerning the relationship between life circumstances and the empirical manifestation of environmental ethics.

Figure one shows our conceptual framework. The framework links life factors (causes) to environmental ethical systems. The links between causal factors and environmental ethics are not so much a social/behavioral theory as a decomposition of key features of the human valuation system; really representing a whole set of social and philosophical theories.

Figure 1: Generating Environmental Values

Causal Factors	Family of Origin → Genetics / Experience with Nature / Socialization, Aculturalization
Conceptual Decomposition of Value	**Metaphysics** • Spiritual idealist • Platonic idealist • Materialist • Dualist ↔ **Ethical System** • Utilitarian • Obligation • Virtue • Natural Rights ↔ **Attitudes and Affect** • Nature beneficial • Nature dangerous • Pessimism and optimism ↔ **Beliefs about Nature** • Abundance vs. scarcity
Observed Archetypes	**Values of Nature** • Anti-environment • Human dominion • Utilitarian Conservation • Stewardship • Radical Environmentalism

The conceptual framework has a number of components separated into three

parts. The first part comprises the causal factors. These include the genetic heritage of

the individual, her social experience, and her life experience with nature. Our survey

data provides information about some of the social and life experiences of our

respondents, but not the genetics.

The second part of the framework is the decomposition of the value system. We

assume that empirical value systems are embedded in the agents overall belief system.

Scholars isolate components of human nature according to their interests and

convenience. Thus, philosophy and, particularly ethics, inquires systematically into

human understanding, whereas sociology and other behavioral sciences seek to explain

and predict attitudes, beliefs and behaviors. It is convenient for us to think about how values are generated using the normal categories of human scholarly discourse, but in real human communication and behavior everything interacts with everything else. We identify four important sub-components of the value-generation system. The first is the agent's belief about the true nature of reality (ontology). These beliefs are metaphysical; they can neither be proven nor disproved through either logic or experience. Nonetheless, they are real in the sense that they frame an agent's belief system. Philosophers general distinguish between idealism and materialism and also admit dualism – a belief in both realities. These are, respectively, the beliefs that "true" reality is a deeper, non-material essence, or that reality is material, or that some of both exists. Idealism comes in a spiritual (souls, gods, spirits) and platonic (pure forms) variety. An example of ontological dualism is the Cartesian dualism of brain and mind.

Pure ethics concerns the study of the proper way for moral agents to behave. Normative ethics attempts to identify and analyze the nature of right action and of the "good." Traditional ethical positions include Utilitarianism, deontological (obligation) ethics, virtue ethics, and contractarian-natural rights ethics. Generally, these systems come in humanistic (secular) and spiritual flavors. Our point here is that, while it is useful for scholars to examine the logical properties and the theoretical application of pure, usually monastic systems, real agents have complex, usually pluralistic ethics into which other metaphysical, psychological, and emotional factors are woven.

Psychological, emotional factors result from the interplay of genetics, socialization and life experience and result in an agent's particular set of attitudes and beliefs. We define *attitude* as an (emotional) predisposition towards things, actions, or

other agents. Here we are most concerned about an agent's attitude towards nature; are they pre-disposed to see nature as dangerous, negative, or as positive, beneficial. Are they pessimistic or optimistic about the possibilities of technical solutions to environmental crises? We define empirical *belief* as an agent's subjective understanding of factual reality. Here we are most concerned with an agent's belief about the natural world, particularly whether the agent sees an abundance or a scarcity of natural resources.

In our view, empirical environmental ethics are a synthesis of these components. Real agents are not pure Utilitarians or pure virtue-ethic stewards. Their environmental ethics are a combination of their view of reality (e.g., idealist or materialist), one or more major ethical tendencies (e.g., Natural rights), fundamental attitudes (e.g., optimism, goodness of nature), and beliefs (e.g., abundant nature). One reason we are attracted to M&M's taxonomy is that it recognizes and incorporates this existential messiness.

Data

The survey data used in our analysis were collected in the United States in1998 using computer assisted telephone interviews (CATI) in 112 major metropolitan areas. The data set includes 2004 completed interviews. The data contain information about respondents view of nature in general, information of the respondents' childhood experiences, as well as demographic variables. The survey data were collected as part of the project "Multicultural Survey of Childhood Environmental Experiences on Adult Sensitivities to Urban and Community Forests" [4] (Lohr and Pearson-Mims, 1999) with the goal of investigating how ethical and childhood experiences contribute to the

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[4] The project was sponsored by the U.S. Forest Service, the National Urban and Community Advisory Council, and Washington State University.

formation of adult attitudes towards forests and trees in urban areas. We selectively include parts of the data relevant to our research questions.

We use information from the U.S. Census Bureau and results Census 2000 to investigate sample representativeness. The sample has 56.4 percent females and this is a slightly higher percentage than the national average of 50.9 percent. This may be a consequence of the survey being at least partially being conducted during day-time, since, on average, more women than men are full-time home-makers. The percentage of high school graduates in the sample was 28.4 % which is somewhat lower than but comparable than the year 2000 national average of 32.8% (National Center for Educational Statistics, 2000). The average household size of 2.8 is close to the average U.S. household size of 2.59. The fact that the average sample household size is a bit larger than the U.S. average may be because families with no children may spend less time at home and, hence, be under-represented. The average age of the sample is 44.6 years, which is higher than the median age of the U.S. population of 35.3 years. This is certainly partly because only people over 18 were included in the survey. The most frequent level of income was in the interval $30,000-$50,000, and according to U.S. Census 2000, the average income level was 27,194 for full-time working-women and 37,057 for full-time working men. Based on comparisons with national statistics, it seems that the data set over-represents home-makers. However, the bias does not seem to be substantial. Other sources of bias are that the survey was only carried-out in metropolitan areas. Nonetheless, the results of this study will provide useful input to the environmental ethics debate, in identifying empirically ethical positions that so far only exists as theoretic constructs.

Existence of environmental ethics positions

The first question we seek to answer is whether a taxonomy of environmental ethics is purely theoretic or if these categories will show up empirically in people or groups of people. There were nine survey questions that reflect the existing ethical view on nature in the data set (Table 2). The respondent was asked whether she\he is active recycling household waste or actively participated programs to enhance the environment such as clean-up on earth day. Recycling and/or participation in programs to enhance the environment (*earthday*) are likely motivated by certain ethical views, such as a position that we need to manage the environment for future generations, i.e., a 'stewardship' position. Since the survey was focused on urban forests, several questions related to the respondent's relationship to trees were included. Respondents were asked whether they thought trees have a right to be in cities, and a confirming reply was taken to indicate that the respondent leaned toward an ethical position where trees have moral rights (ecocentrism) and not only instrumental value. Agreeing that 'trees should be planted in cities to attract wildlife' may indicate several positions. It could be ecocentric in that wild animals are considered moral beings; it could be more of a stewardship position in that wildlife in cities are important for future generations or it could be an indication of an utilitarian position for the pure enjoyment of seeing wild birds in trees in the city. Agreeing that 'it is your right to do whatever you want to your trees, regardless of what others think' may indicate a more utilitarian ethical position. If a respondent agreed that 'trees have a particular personal, symbolic of spiritual meaning' this points in the direction of a more biocentric (stewardship) or ecocentric view on nature.

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In addition to the questions regarding trees, there were three questions in the survey that related to respondents' views about nature in general. Respondents were asked whether nature exists to provide natural resources for human use – a clear anthropocentric view. Respondents that agreed that natural areas that are untouched by humans should exist are more likely to have biocentric (stewardship) or ecocentric views, though some Utilitarian-conservation views would support wilderness (if it gave pleasure to humans, or increased the quality of life). Finally, agreeing that humans have a responsibility to protect nature and the environment indicates a stewardship or ecocentric view. It is interesting to note that this particular question had many item non-responses (refusals).

Assuming that ethical positions can be detected, we are also interested in explaining why certain people may subscribe to certain ethical positions. The survey includes several questions that may explain adult attitudes toward nature and the environment (Table 3). The first subset of these variables relates to the respondent's childhood experiences. One set of important factors may be the degree to which the child becomes attached to the physical surroundings in their childhood community as indicated by the number of years the respondent lived in the childhood community. Additional questions ask the respondents about the specific qualities of the physical surroundings in their childhood neighborhood. In particular, respondents were asked if their childhood neighborhood areas with water, forests, trees, flowers, grass and also if it had parking lots, a busy street and/or large buildings. Major nature alterations of childhood areas may be distressing, and respondents were also asked if such nature alterations had occurred in their childhood area. A bond with other living beings may be established by

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spending time around animals and plants, and respondents were, therefore, asked whether they played outside with trees or plants and if they had the responsibility to care for plants for pets. Who a child is outside together with may affect how they perceive their nature experiences. In particular, the respondents were asked whether they were mostly outside alone, together with parent(s), their school, siblings, a friend and/or friends. Respondents were also asked if they felt their attitudes about nature had been affected by family, friends, teachers, participation in activity programs or groups, newspapers and books, and/or radio and TV.

Presumably participation in outside activities will affect a child's view of nature. It is likely that outside activities as a child may lead to a greater appreciation of nature as an adult though it is also probable that those who have negative outdoor experiences as children will have a negative view of nature. Respondents were asked what types of activities they participated in as a child; in particular they were asked if they had been camping, hunting and fishing, birdwatching, gardening, planting, at the beach or active outside alone. Finally, the respondents were asked questions regarding their current demographics: their age, education and income.

Method of Analysis

With this large number of variables, relationships among the variable may be detected using simple and probing multivariate statistical techniques (Johnson and Wichern, 1998). As a means of exploratory analysis of the data we use canonical correlation analysis to seek a structure of "natural" groupings of ethical views and of their explanation.

Canonical correlation analysis can be used in order to quantify and characterize associations between two data sets that each contains several variables. The method concentrates a high-dimensional relationship between two data sets into a relationship described by fewer variables. In canonical correlation analysis, linear combinations of variables from each data-set called canonical variables are formed, such that the correlation between the two canonical variables is maximized. The correlation between the two canonical variables is the first canonical correlation. The next step in canonical correlation analysis is to find a second set of canonical variables, uncorrelated with the first pair that generates the second highest canonical correlation. The total number of pairs of canonical variable pairs equals the number of variables in the set with the fewest variables (Johnson and Wichern, 1998; SAS/STAT User's Guide, 1990).

Canonical variables are constructed as linear combinations of variables and thus have no necessary a priori meaning. However, they can often be associated with subject-matter variables. The coefficients of the canonical variables are called canonical coefficients and are important when giving such a subject-matter interpretation of the canonical variables. The identification can also be aided by looking at the correlations between the canonical variates and the original variables (Johnson and Wichern, 1998). It is useful to standardize the variables if the variables in the data sets have different units, otherwise the size of the canonical coefficients may be affected by the relative size of the value of variables.

In our notation, variables that indicate ethical views on nature are dependent variables (Table 1). Canonical variables constructed from the dependent variables are in our analysis denoted as $\mathbf{U}_i$, and the structure of this variable is

(1)　　$\mathbf{U}_i = u_{i1}Y_1 + u_{i2}Y_2 + ... + u_{ik}Y_k$

where u_{ij}'s are canonical coefficients; Y_j is dependent variable j, and k is the number of variables in the sub data-set that includes all dependent variables. Variables that may explain these attitudes are explanatory variables (Table2). The canonical variable that corresponds to the canonical variable $\mathbf{U}_i$ is denoted by $\mathbf{V}_i$ where

(2)　　$\mathbf{V}_i = v_{i1}X_1 + v_{i2}X_2 + ... + v_{il}X_l$

where v_{ir}'s are canonical coefficients; X_r is explanatory variable r, and s is the number of variables in the sub data-set that includes all explanatory variables. Furthermore, the i'th canonical pair, $(\mathbf{U}_i, \mathbf{V}_i)$ is correlated by r_i, and the value of r_i indicates how much an ethical view (U$_i$) correlates with the explanatory variables embodied in the corresponding V$_i$-vector.

Results of Analysis

　　　　The canonical pairs in the analysis relate ethical positions to childhood experiences. Four canonical pairs were significantly correlated with a Type I error cut-off point of $a = 0.05$, and will therefore be the focus of our discussion. We will start with interpreting the canonical variables that describe ethical positions; we will then discuss how and to what extent these ethical positions can be explained by childhood experiences. The coefficients of the canonical variables for the ethical positions are presented in Table 4. There are distinct patterns in the data that indicates that some of the ethical positions that were discussed earlier are not just conceptual abstractions but actually exist in the population.

The first listed canonical variable for ethical view on nature, $\mathbf{U}_1$, seems to represent some type of stewardship (biocentric) or radical environmentalist (ecocentric) view. This canonical variable is highly and positively correlated to the variables '*Spiritual*', '*Earthday*', '*Wildlife*', and '*Untouched*' (Table 5). Of these, the strongest correlation is with '*Spiritual*'. The variable *Spiritual* represents the thought that trees have a particular personal, symbolic or spiritual meaning and most uniquely in this study may be thought of as a view leaning toward some type of biocentrism or ecocentrism. This ecocentrism does not conflict with, but rather explains, the high correlation with participation in clean-up on earth-day or other programs to enhance the environment, and the thoughts that and that natural areas that are untouched by humans should exist and that trees should be planted in cities to attract wildlife. We also note that this variable was negatively correlated with "ownright" – the variable indicating that people have the right to do whatever they want with trees that they own. Therefore in the following discussion we will denote the canonical variable $\mathbf{U}_1$ 'Spiritual-ecocentric.'

The second canonical variable for ethical view on nature, $\mathbf{U}_2$, (Table 4, 5) certainly represents an anthropocentric point of view. This canonical variable is highly and positively correlated to the variables '*Resourceforhuman*', '*Ownright*', and '*Treeright*', but negatively correlated to '*Recycle*'. The strongest correlation is with '*Resourceforhuman*' which represents the thought that nature exists to provide natural resources for human use. This is a strongly anthropocentric attitude, as is the thought that it is your right to do whatever you want to your trees regardless of what others think. While there are some grounds for placing this view in either the human dominion or the conservation-utilitarian category, we will assign it to the conservation-utilitarian

category. The fact the U_2 canonical variable is positively correlated to 'Treeright' (i.e., trees have a right to exist in cities) argues more for the conservation than the human dominion category. Not recycling may or may not be a utilitarian view but seems more likely to simply indicate lack of enthusiasm.

The canonical variable U_3 also presents some ambiguity. On the one hand this variable is negatively correlated to '*Recycle*' and positively correlated to '*Ownright*' implying a human dominion view; on the other hand this variable is highly negatively correlated to '*Resourceforhuman*', and positively correlated to '*Untouched*' and '*Wildlife*' indicating more ecocentric values. This variable represents the view of an individual who does not invest time in recycling and who would like to retain the right to do whatever he/she wants to trees on own property, but at the same time disagrees that nature exists to provide natural resources for human use, and thinks natural areas untouched by humans should exist and who thinks that trees should be planted in cities to attract wildlife. It seems that this is the view of a person who wants nature to be protected but who is rather detached on a personal level. This may indicate that the person does not find any sense of urgency to protect the environment. We will denote this view as 'environmental indifference or detachment'. An alternative interpretation is that this group may simply reflect that many people do not have well-formulated views about how they are, or should be, related to nature.

The final canonical variable for ethical views of nature listed in Table 4, U_4, is negatively correlated with '*Spiritual*', '*Treeright*', and '*Untouched*', all variables that indicate that natural beings have value beyond their instrumental value. So the view represented by the fourth canonical variable seems to be somewhat the inverse of the

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ecocentric view found in the first canonical variable. However, the fourth canonical variable has high positive canonical correlations with '*Earthday*', '*Wildlife*' and '*Ownright*'. The positive correlation with '*Earthday*' indicates that this view allows for environmental concern and personal contribution, and enjoyment of nature is indicated through the positive correlation with '*Wildlife*'. Finally, the positive correlation with '*Ownright*' indicates some sense of anthropocentrism. We choose to denote this view as an anthropocentric view and suggest that it may represent the 'human dominion' point of view due to the negative correlation with the ecocentric variables and the positive correlation with human use and management of nature.

In summary, we have detected four ethical positions toward nature in the data: the 'Spiritual-Steward', the 'Conservation-Utilitarian', the 'Environmental Indifference', and the 'Human Dominion' view of nature. We will now continue with interpreting canonical variables that may explain the view on nature and relate these variables to ethical view on nature. The coefficients of the canonical variables for the ethical positions are presented in Table 5.

The stereotypical respondent for V_1 has the following characteristics. The respondent is more likely a woman than a man, is above average age, has higher than the average level of education and grew up in a neighborhood with natural areas such as lakes, woods, and large areas of grass. The person experienced major efforts to alter natural areas or remove trees near her/his home. The person often played often outside and often by her/himself. The person often took care of plants and animals, and attitudes about nature were influenced by the opinions of family, friends, school teachers, programs or groups she/he participated in and books, newspapers or magazines. In

summary, V_1 seems to represent a highly educated female who grew up in more rural areas. The canonical variable V_1 has a correlation of 0.4233 to U_1, the canonical variable found to possible represent a more 'Spiritual-Steward' (ecocentric) view on nature.

The stereotypical respondent representing canonical variable V_2 is again more likely a woman than a man. She/he has lower than average education and income. The typical respondent lived longer than average in the childhood community; and the community was an area that had trees in the neighborhood but otherwise not much nature. There were no major efforts to alter natural areas in the childhood neighborhood. The respondent typically took care of plants but did not have responsibility to take care of animals. The person played outside with siblings and was active hunting, fishing and bird watching. As a child, the person's opinion about nature was influenced by teachers, as well as by radio, TV, book, newspapers and magazines. In summary, V_2 represent a female who grew up in a suburb or urban areas, and who belongs to a lower socio-economic class than the typical respondent for V_1. The canonical variable U_2 represented a more 'conservation-utilitarian' view of nature. This variable has a correlation of 0.3079 with V_2.

The typical respondent for the canonical variable V_3 is a young male that did not live many years in the childhood community. The childhood neighborhood was rich in natural areas, and the typical respondent did not experience major efforts to alter natural areas or remove trees near your home. The person typically took care of pets and/or animals, played and was active outside alone. The typical respondent reports that attitudes about nature were influenced early on by family, and media -- such as radio, TV,

newspapers, magazines and books. In summary, the typical respondent for variable $\mathbf{V}_3$ is a young male who for some part of his childhood lived in rural areas. The canonical variable $\mathbf{U}_3$ representing an 'Environmental Indifference or detachment' type of view of nature has a correlation of 0.2526 with $\mathbf{V}_3$. This individual has an ill-formed or mixed ethical stance towards nature.

The stereotypical respondent representing the canonical variable $\mathbf{V}_4$ is a male, of above average age and with higher income. The person grew up in an urban area and did not play outside much. The person was given the responsibility to care for pets and plants and was often outside alone or with parents, friends and siblings. She/he was somewhat active outside with other people. The typical respondent in this group reports that the programs or groups that she/he participated in particularly influenced attitudes to nature in an early age. In summary, $\mathbf{V}_4$ is a male above average age, with above average income and who grew up in an urban area. The canonical variable $\mathbf{V}_4$ has a correlation of 0.2072 with $\mathbf{U}_4$, the canonical variable found to possible represent a 'Human Dominion' view of nature.

Discussion and Conclusion

We have suggested that this paper is, in some sense, an extension of the work by M&M. Certainly it is an extension in that it continues their work in empirical or descriptive environmental ethics. Also, our results are generally consistent with their results that different "flavors" or types of environmental ethics can be found empirically.

Moreover, our results find several types of environmental ethics that are similar to types included in the M&M (modified) taxonomy.

However, this paper uses different data, different methods, and produces different, though, compatible findings, compared to the M&M study. First, the data used in this study are from a survey instrument not expressly designed to systematically investigate descriptive environmental ethics. The questions had more of an environmental attitudes flavor than an environmental ethics flavor. This reduces our ability to investigate the full range of environmental ethical systems developed by M&M. We find only four ethical systems, compared to the 5 major and 19 sub-categories identified by M&M. On the other hand, this data set allows us to do some things that M&M could not. We are able to explicitly investigate some "messy" existential linkages among attitudes, beliefs, and values. Also, we are able to investigate some of the life experience factors that may generate particular ethical positions. (Discussion below)

We use the multivariate method of canonical correlation to analyze this data. Our use of canonical analysis allowed us to investigate the relationship between environmental ethical positions and the early life experiences of the respondents. We found four "significant" groups.

1.   An older, well-educated woman who grew up near trees, lakes, and grass typifies our most well defined group. As a child she took care of plants and pets and experienced an environmental disruption. She was socially influenced by networks of family and friends and by print media. She grew up to adopt a ***spiritual-ecocentric*** viewpoint. Trees have a spiritual meaning to her. She believes in most of the other "green" values in the survey, and she

specifically doesn't think that tree owners should be entitled to do whatever they want with their trees.

2.   A less educated and poorer women who grew up in urban or suburban locations, and took care of plants but not animals typifies our second group. She had an active outdoor life but was usually alone or on school trips. Both print and electronic media influenced her. She grew up to be a weak *'conservation-utilitarian.'* She is indifferent to the spiritual quality of trees and she is not active in recycling or "green" activities. She is also indifferent about wilderness or attraction of animal life to urban areas with trees. She thinks that nature exists for human use and owners have the right to use trees as they see fit.

3.   A young male who lived for some time in rural areas but moved around represents a third group. He played outside by himself and was influenced by family, electronic media, and print media. This person grew up with conflicting, ill-formed views towards nature. He believes that owners should have the right to do what they wish with their trees, but he doesn't see nature as a storehouse of resources for human use. He doesn't recycle and he's a weak participant in environmental events. He mildly favors wilderness and the attraction of animals with trees.

4.   An older male with higher income who grew up in an urban area and did not play outside much as a child typifies our third group. He was active in hunting and birdwatching, but not in gardening or camping. This person grew up to adopt a human dominion perspective – being active in environmental

activities and favoring wildlife and the rights of humans to use there trees

without regard to others, but with negative associations towards spirituality,

wilderness, and responsibility to protect nature.

The chief disadvantage of use of canonical correlation may be that the canonical

variates are forced to be orthogonal by the procedure. However, we believe that true

empirical ethical positions are not orthogonal. They overlap in at least two ways. First,

the positions themselves are defined along several dimensions and they are likely to

overlap in some dimensions while they are divergent on others. Thus, most of the sub-

categories within M&Ms major five categories have something in common with the other

members of their major category (compare religious dualism versus intellectual dualism,

or Animism and Pantheism). The other way the positions overlap is that we imagine that

real people often have pluralistic value systems. We feel the imposition of orthogonality

on the data may have forced some results. In fact, in future research we intend to analyze

the results with cluster analysis which will allow us to segment groups, even should the

groups differ by degree of adherence rather than qualitatively.

In conclusion, we found four ethical systems linked to four different "types" of

people. One of the ethical systems is decidedly spiritual and one seems rather ill-defined

or indifferent towards nature. The other two systems show anthropocentric values. An

economist would probably classify both of these as Utilitarian, but one is more

conservation minded, one more use minded.

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Table 1: Environmental Ethics: A Pluralistic Typology

Environmental Ethics	Representative Statement
Anti-Environment	
1.　Physical Threat	1.　Nature can be dangerous to human survival.
2.　Spiritual Evil	2.　Nature can be spiritually evil.
Benign Indifference	
3.　Storehouse of Raw Materials	3.　Nature is a storehouse of raw materials that should be used by humans as needed.
4.　Religious Dualism	4.　Humans were created as more important than the rest of nature.
5.　Intellectual Dualism	5.　Because humans can think, they are more important than the rest of nature.
Utilitarian Conservation	
6.　Old Humanitarianism	6.　Cruelty toward animals makes people less human.
7.　Efficiency	7.　The supply of goods and services provided by nature is limited.
8.　Quality of Life	8.　Nature adds to the quality of our lives (for example, outdoor recreation, natural beauty.)
9.　Ecological Survival	9.　Human survival depends on nature and natural processes.
Stewardship	
10.　Religious/Spiritual Duty	10.　It is our religious responsibility to take care of nature.
11.　Future Generations	11.　Nature will be important to future generations.
12.　God's Creation	12.　Nature is God's creation.
13.　Life-Based/Mysticism	13.　All living things are sacred.
Radical Environmentalism	
14.　Humanitarianism	14.　Animals should be free from needless pain and suffering.
15.　Organicism/Animism	15.　All living things are interconnected.
16.　Pantheism	16.　All living things have a spirit.
17.　Natural Rights	17.　All living things have a moral right to exist.

Table 2. Dependent Variables

Variable Description	*Variable Name*	*Coding in Analysis*
During the past year, how often have you recycled materials, such as newspaper, glass, or aluminum cans, in your home?	*recycle*	1 often 0 sometimes 0 never
During the past year, have you participated in any activity or program to enhance the environment such as clean-up on earth-day?	*earthday*	1 yes 0 no
Trees have a right to be in cities.	*treeright*	1 strongly agree 0 agree 0 disagree 0 strongly disagree
Trees should be planted in cities to attract wildlife.	*wildlife*	1 strongly agree 0 agree 0 disagree 0 strongly disagree
It is your right to do whatever you want to do with your trees, regardless of what others think	*ownright*	1 strongly agree 0 agree 0 disagree 0 strongly disagree
Do trees have a particular personal, symbolic or spiritual meaning to you?	*spiritual*	1 yes 0 no
Nature exists to provide natural resources for human use.	*resourceforhuman*	1 strongly agree 0 agree 0 disagree 0 strongly disagree
Natural areas that are untouched by humans should exist.	*untouched*	1 strongly agree 0 agree 0 disagree 0 strongly disagree
Humans have a responsibility to protect nature and the environment.	*responsibility*	1 strongly agree 0 agree 0 disagree 0 strongly disagree

Table 3. Independent Variables

Variable Description	Variable Name	Coding in Analysis
About how many years did you live in your childhood community?	*yearscommunity*	# of years
Regarding the area right around your home or residence like when you were 5 years old. Was your home or residence next to…		
-water?	*waterarea*	
-forest?	*forestarea*	
-trees?	*treesarea*	
-flowers?	*flowersarea*	
-grass?	*grassarea*	
-parking lot?	*parkinglotarea*	1 yes
-busy street?	*busystreetarea*	0 no
-large buildings?	*largebuildingsarea*	
Before age 11, were you aware of major efforts to alter natural areas or remove trees near your home?	*alter*	1 yes 0 no
Play outside with trees or plants?	*playoutside*	1 often 0 somewhat 0 not at all
How often did you participate in this activity before age 11?		1 often 0 occasionally
-taking care of indoor or outdoor plants	*careplants*	0 rarely
-taking care of pets or animals	*carepets*	0 never
Before age 11, when you spent time in outdoor places with trees or plants were you often…:		1 yes
-alone?	*outalone*	0 no
-with a parent or other significant adult?	*outwparent*	
-with a teacher or school group?	*outwshcool*	
-with an older or younger sibling?	*outwsibling*	
-with a friend?	*outwfriend*	
-with a group of friends?	*outwfriends*	

Table 3. Independent Variables, Continued

Variable Description	Variable Name	Coding in Analysis
How often did you participate in this activity before age 11? -camping -hunting or fishing -going to the beach -birdwatching -spending time alone in the outdoors - picking flowers, fruits or vegetables from a garden -participate in planting trees or plants	*activcamping* *activehuntfish* *activbeach* *activbirdwatch* *activalone* *activgarden* *activplanting*	1 often 1 occasionally 0 rarely 0 never
Before age 11, how much were your attitudes about nature influenced by opinions of … -your family? -your friends? -your school teachers? -programs or groups you participated in? -book, newspapers or magazines? -television or radio?	*inflfamily* *inflfriends* *inflteachers* *inflgroups* *inflpapermedia* *inflbroadcasting*	1 very much 0 somewhat 0 not at all
Gender	*gender*	1 male 0 female
Age	*age*	# of years
Education	*edu*	levels 1-10, higher levels means more education
Income	*inc*	equally spaced levels

Table 4. Results from Canonical Correlation Analysis, Ethical Views (Dependent variables): Correlations Between the Ethical View on Nature and Their Canonical Variables.
(original:)

Variable	U_1	U_2	U_3	U_4
Recycle	0.2477	-0.5050	-0.5922	0.0539
Earthday	0.5777	-0.1240	0.1028	0.5720
Treeright	0.2730	0.3983	-0.0647	-0.2657
Wildlife	0.3866	-0.0697	0.2074	0.3737
Ownright	-0.1254	0.4719	0.3235	0.3216
Spiritual	0.7711	0.0230	0.1197	-0.4597
Resourceforhuman	0.2419	0.6649	-0.5578	0.1570
Untouched	0.3360	-0.0423	0.2085	-0.2628
Responsibility	0.2668	0.1397	0.1921	-0.0943

Table 5. Results from Canonical Correlation Analysis, Ethical Views (Dependent variables): Correlations Between the Ethical View on Nature and Their Canonical Variables Sorted in Descending Values

Variable	U$_1$	Variable	U$_2$	Variable	U$_3$	Variable	U$_4$
Spiritual	0.7711	Resourceforhuman	0.6649	Ownright	0.3235	Earthday	0.5720
Earthday	0.5777	Ownright	0.4719	Untouched	0.2085	Wildlife	0.3737
Wildlife	0.3866	Treeright	0.3983	Wildlife	0.2074	Ownright	0.3216
Untouched	0.3360	Responsibility	0.1397	Responsibility	0.1921	Resourceforhuman	0.1570
Treeright	0.2730	Spiritual	0.0230	Spiritual	0.1197	Recycle	0.0539
Responsibility	0.2668	Untouched	-0.0423	Earthday	0.1028	Responsibility	-0.0943
Recycle	0.2477	Wildlife	-0.0697	Treeright	-0.0647	Untouched	-0.2628
Resourceforhuman	0.2419	Earthday	-0.1240	Resourceforhuman	-0.5578	Treeright	-0.2657
Ownright	-0.1254	Recycle	-0.5050	Recycle	-0.5922	Spiritual	-0.4597

Table 6. Results from Canonical Correlation Analysis, Childhood Experiences and Demographics (Independent variables): Correlations Between the Explanatory Variables for View on Nature and Their Canonical Variables.

Variable Name	V_1	V_2	V_3	V_4
yearscommunity	-0.0394	0.1508	-0.2516	-0.0889
waterarea	0.1941	0.0941	0.1201	0.0912
forestarea	0.1470	-0.0414	0.2995	-0.0322
treesarea	0.2096	0.1340	0.2342	-0.1642
flowersarea	0.2521	-0.0631	0.1168	-0.0482
grassarea	0.1749	-0.0291	0.2171	0.1509
parkinglotarea	-0.0374	0.0731	-0.0631	-0.002
busystreetarea	-0.0796	0.0716	-0.2658	-0.0933
largebuildingsarea	-0.045	0.0224	-0.2821	0.2678
alter	0.2173	-0.1586	0.1573	0.0288
playoutside	0.3405	-0.0357	0.0777	-0.1919
careplants	0.5308	0.2525	-0.0128	0.1047
carepets	0.4026	0.0666	0.2123	0.1447
outalone	0.2391	-0.0377	0.1863	0.2663
outwparent	0.0633	0.0307	-0.1094	0.1566
outwschool	0.1374	0.1081	-0.3278	0.0539
outwsibling	0.0865	0.2695	-0.2341	0.1667
outwfriend	0.0256	-0.0403	0.0114	0.2091
outwfriends	0.0048	-0.0092	-0.1374	0.1023
activcamping	0.2370	-0.0185	0.4838	0.0486
activhuntfish	0.0746	0.1576	0.3644	0.2365
activbeach	0.1285	-0.1179	-0.133	-0.2354
activbirdwatch	0.5672	0.1585	0.0902	0.2611
activalone	0.3781	-0.0722	0.2177	-0.1170
activgarden	0.3803	0.0971	0.1261	0.0045
activplanting	0.4234	-0.0261	0.0656	0.1680
inflfamily	0.4430	0.0430	0.2747	-0.1645
inflfriends	0.2422	0.0982	-0.1551	0.0128
inflteachers	0.3516	0.2332	-0.0306	0.0757
inflgroups	0.4069	0.0378	0.0166	0.1837
inflpapermedia	0.3525	0.1692	0.1608	-0.0283
inflbroadcastmedia	0.0551	0.2229	0.2373	-0.1479
gender	0.3325	0.1574	-0.3128	-0.4671
age	0.3223	-0.0728	-0.3518	0.1378
edu	0.1599	-0.8249	0.0031	-0.0107
inc	0.0415	-0.4628	0.0054	0.2196

Table 6. Results from Canonical Correlation Analysis. Correlation coefficients between Ethical View on Nature and Childhood Experiences and Demographics: Test of H_0: The canonical correlations in the current row and all that follow are zero

Canonical pair	Canonical correlation r_i	Likelihood Ratio	Approximate F value	Numerator Degrees of Freedom	Denominator Degrees of Freedom	P-value
1	0.4233	0.5558	3.07	315	13917	0.0001
2	0.3079	0.6883	2.24	272	12440	0.0001
3	0.2526	0.7880	1.67	231	10944	0.0001
4	0.2072	0.8510	1.36	192	9430.4	0.0008