

EVERYDAY ENVIRONMENTALISM IN CLARKE COUNTY, GEORGIA: AN
ANALYSIS OF PERCEPTION, CONCERN, AND BEHAVIOR

by

HARI BHAGAT GURUNG

(Under the direction of Robert E. Rhoades)

ABSTRACT

Anthropology has little studied everyday environmentalism in post-industrial societies. This dissertation research investigates variation in environmentalism as influenced by level of activism (laypersons, activist environmentalists, and non-activist environmentalists and science/environmental professionals), ethnicity, gender, age, and education in Clarke County, Georgia. Data were collected on seventy-nine individuals using slip-sorting, modified thematic apperceptions test, and semi-structured ethnographic interview methods.

Level of activism and gender differences are observed in ecosystem, environmental state, and environmental protection orientations in the sample. Research participants volunteered twelve types of values. Consumptive, aesthetic, and ecological are the primary values. Level of activism, ethnicity, gender, age, and education are important in explaining environmental value orientations in the sample.

Although environmental concerns vary significantly by level of activism in the study sample, a general environmental concern is expressed. The concerns expressed and behaviors reported are invariant in the layperson sample as defined by ethnicity, age, and education. This finding is interesting in light of other findings in the social sciences, e.g., blacks rated lower than whites, inverse relationship between age and environmentalism, and positive relationship between education and environmentalism. Gender differences are observed. Males showed significantly higher levels of environmental concern than females, but they did not differ in pro-environmental behaviors. This indifference is due to pragmatic and home-oriented nature of females which predispose them to take pro-environmental behaviors.

The environmental ethics held by the sample is ecological-anthropocentrism or utilitarian-conservationism. Contrary to the much publicized anti-ecological Christian ethics research participants invoked their Christian belief positively to express environmental beliefs, values, and concerns. These findings suggest positive attitude towards the environment. But, environmental concerns expressed are inadequately translated into action, especially in the layperson sample.

Data suggest low level of ecological/environmental knowledge in the layperson sample. Public policies/programs to enhance public environmental knowledge are important to reduce discrepancy between concern and action. Future research into the discrepancy in a social

dilemma and cognitive dissonance theoretical frameworks is suggested. Religion as a potential influence on public environmentalism has received insignificant attention in environmental research. Future research should study religion as an institution and a medium to achieve environmental sustainability and human survivability.

INDEX WORDS: American environmentalism, Cluster analysis, Cultural consensus analysis, Ecosystem, Environment, Environmental concern, Environmental behavior, Environmental degradation, Environmental perception, Environmental protection, Environmental value, Everyday environmentalism, Environmentalism

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DEDICATION

To my beloved wife Subhadra Gurung for her untiring support and perseverance which made this dissertation possible. I owe this doctoral dissertation to her.

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LIST OF ACRONYMS

A	Activist
ACC	Athens-Clarke County
ACTV	Activist environmentalist
AGGC	Athens Grow Green Coalition
ANOVA	Analysis of Variance
BF	Black female
BM	Black male
CEQ	Council on Environmental Quality
DCPF	Distributive cultural psychological framework
DDT	Dichloro-diphenyl-trichloroethane
Env	Environmentalist
FNA	Federation of Neighborhood Association
HB	High pro-environmental behavior
HC	High environmental concern
L	Layperson
LAYP	Layperson
LB	Low pro-environmental behavior
LC	Low environmental concern
LSD	Least significant difference
MB	Moderate pro-environmental behavior
MC	Moderate environmental concern
MTAT	Modified thematic apperceptions test
NM/PF	Non-activist members of environmental organizations, and science and environmental professionals
P	Non-activist members of environmental organizations, and science and environmental professionals
PCB	Polychlorinated Biphenyls
UG	Undergraduate
UOWN	Upper Oconee Watershed Network
US	United States
WF	White female
WM	White male

CHAPTER 1: INTRODUCTION

1.1 Statement of the Problem

Since environmental alteration and degradation are primarily anthropogenic, anthropology has an important place in environmental research, discourses, and engagements. *Culture*, the key concept of anthropology, interposes between humans and their environment and mediates between them (Carneiro 1968; Milton 1996). However, the recognition of culture's role in mainstream environmentalism in the United States (US) has been largely peripheral in praxis and policy. Environmentalism has been more influenced by the ethical conviction that environmental problems can be solved through science, technology, and legislation. Thus the physical and biological sciences have received greater attention among policy makers and active environmentalists, while social science in general—and anthropology in particular—has been given little recognition as a priority in environmental management and policy research (Benton and Redclift 1994; Milton 1996).

During the 1960s and 70s, anthropology showed little interest in studying contemporary ecological movements. In fact, anthropology in general wanted to dissociate from its applied wing and ecological anthropologists specifically wanted to distance themselves from the popular ecology movement of that time period (Rhoades 1992). The cognitive revolution of the sixties, the interpretive turn of the seventies, and the poststructuralist and postmodernist bent of the eighties, marked the demise of *ecosystem ecological anthropology* and the emergence of a *new ecological anthropology*, also called *environmental anthropology*. As opposed to ecological anthropology, environmental anthropology has been significantly influenced by post-structuralist

and post-modernist social and cultural theory orientations (Biersack 1999; Brosius 1999a; Kottak 1999). In the past two decades, trends in anthropological engagements with environmentalism have been a sustained critique of romantic essentialized images, emphasis on contestation, and interest in globalization, and transnationality of environmental movements and discourses (Brosius 1999a). Recent anthropology has mostly analyzed environmentalism as a socially constructed phenomenon with an emphasis on issues of power and inequality, and a focus on discourse, development, social movements, and protected areas (Brosius 1997; Brosius 1999a; Brosius 1999b; Freeman and Kreuter 1994; Kalland 1993; Zerner 1994). With the exception of a few studies—for example, Kempton et al. (1995) on American environmental values, and Paolisso & Maloney (2000) on farmer environmentalism in the Chesapeake Bay area—anthropology has given little scientific empirical attention to the study of *non-activist everyday environmentalism* in contemporary post-industrial societies, such as the United States.

A review of social science literature on American environmentalism argues that the *American dominant social paradigm*—a belief in abundance, progress, growth and prosperity, science and technology, laissez-faire economy—is anti-ecological, rooted in the colonial and frontier time periods and experiences, and, more importantly, the western European socio-cultural and religious worldviews and science traditions (Allin 1982; Dunlap and Van Liere 1978a; Dunlap and Van Liere 1984; Pirages 1977). However, as opposed to nineteenth century environmentalism, which emphasized preservation and/or conservation of wilderness, the 1960s saw a surge of “new environmentalism” where conservation was but one aspect. The new environmentalism included air and water pollutions, solid waste disposal, energy, pesticides, and nuclear hazards, among others (Carmin 1999; Papadakis 1998; Stern, et al. 1995b; Wells and Schwartz 1997). Since the 1960s, Americans have become significantly pro-environmental

leading a *New Environmental Paradigm* among Americans (Dunlap and Van Liere 1978a; Stern and Dietz 1994). Opinion polls and research show high rates (~90%) of environmental concern, 75-80% of the population claim to be environmentalists, and an incredible 97% of the American population opined that the country should do more about environmental protection (Albrecht, et al. 1982; Axelrod and Lehman 1993; Bardes and Oldendick 2000; Dunlap 1991; Erikson and Tedin 2001; Mohai and Bryant 1992; Noe and Snow 1989/90; Steel, et al. 1994; Stern and Dietz 1994; Thompson and Barton 1994). Research show that environmental protection has become a societal consensual issue and basic value with little change in the social bases for environmental concern (Dunlap 1991; Jones and Dunlap 1992). Fundamental cultural change in terms of conceptual shifts in language, e.g. the use of terms like “rainforest” and “wetlands” has also emerged (Kempton, et al. 1995). These opinion polls and studies lead one to conclude that similar values and beliefs pervade American environmentalism. However, from an anthropological and a social sciences viewpoint the following questions and opportunities arise in terms of how environmentalism varies in the US population:

First, study of environmental perception allows understanding the environmental awareness, values, and beliefs, which guide people’s action/s. Therefore research into variations in the perceptions of environment in the population becomes an important research question.

Second, although a rich body of research on environmental concerns and attitudes is available, there is a general paucity of systematic social science research on environmental behaviors, except for recycling (Hallin 1995; Olli, et al. 2001). Also, research linking environmental concerns and behaviors are limited. The few available studies point to a weak consonance between concerns and behaviors (Axelrod and Lehman 1993; Dunlap 1991; Kempton, et al. 1995; O’Riordan 1976). Therefore, research designed to study environmental

concerns and behaviors simultaneously and their correlation addresses an important gap in the literature.

Third, very little is known about environmentalism of Afro-American and other ethnic minorities as compared to Euro-Americans (Arp III and Kenny 1996; Jones and Carter 1994; Mohai 1990; Noe and Snow 1989/90; Parker and McDonough 1999). Similarly, very little is known about the differences in environmentalism of laypersons, activist environmentalists, and non-activist environmentalists and science/environmental professionals. Therefore, research into studying these intra-population variations will contribute to a better understanding of how environmentalism is expressed.

Given these research questions and opportunities, this dissertation will systematically address and test hypothesis on the following two broad questions (see pages 8, 9 for hypotheses):

- How does perception of environment vary in the study population, and what explains the variance?
- What is the variability of environmental concerns and the different types of reported pro-environmental behaviors in the study population, and the correlation between environmental concerns and reported behaviors?

1.2 Definition of Terms

Everyday environmentalism in this dissertation is operationalized by studying environmental *perception*, *concern*, and *reported behaviors* in the sample population as influenced by socio-cultural factors, for example, ethnicity, sex, age, education, and levels of activism. At the outset, given that these and other terms used here have popular and scientific formulations, it is necessary to define them precisely.

The word *environment*, which has become a part of everyday language since the 1960s (Eblen and Eblen 1994), is technically speaking anything that exists outside of the self (Heberlin

1981). It can signify something internal (such as building), or external (natural, biophysical). In this dissertation, I am concerned with external bio-physical environment, inclusive of natural.

Environmentalism, for purposes of this study, is defined as a concern to protect the environment/nature, particularly from the harmful effects of human activities, through human responsibility and effort. Thus, both, *activist environmentalism* and *non-activist everyday environmentalism* fall within its scope.

The environmentalisms of research participants in this dissertation are classified into three groups, which I call *level of activism*. The basis of classification is a combination of levels of activism (activist and non-activist), and levels of scientific ecological knowledge acquired from academic training, job, and environmental organizations (layperson and non-layperson knowledge). The derived groups are: a) activist environmentalism of members of environmental organizations, b) non-activist environmentalism of passive members of environmental organizations, and scientific and environmental professionals, and c) non-activist everyday environmentalism of laypersons.

Activist environmentalism, pursued by members of environmental organizations, is guided by the science of ecology, and is largely preservationist and/or conservationist with tints of ecocentric and/or biocentric value orientation. It includes public sphere environmental activism like demonstration, lobbying, and active membership in environmental organizations (Stern 2000). However, environmentalisms of passive members of environmental organizations, scientific and environmental professionals, and laypersons are non-activist. Non-activist everyday environmentalism of passive members of environmental organizations, and scientific and environmental professionals are largely informed by ecological science, although they may be partly informed by socio-cultural worldviews, values, and beliefs. Non-activist everyday

environmentalism of laypersons deal with knowledge and behavior of common people who perceive and act upon values and convictions related to their environment and livelihoods. This level of environmentalism is concerned with the informal, oral, traditional, or popular knowledge, meaning of ordinary people, in contrast with school or book-based, expert, or scientific knowledge. Non-activist everyday environmentalism of laypersons may be, in parts, informed by science, and cultural world-view, values and beliefs about environment, which act as cultural filters. It includes non-activist public sphere and private sphere environmental behaviors; for example, environmental citizenship, donating monies, recycling, and adopting pro-environmental practices based on ecocentric and/or economic (livelihood) values.

Perception is the process of immediate sensory experience in an organism, or a judgment on or inference from what an organism senses with its sensory organs. It is a process of apprehending the immediate environment through sensory input, and organizing the various sensations into meaningful patterns by integrating prior knowledge (cognition) and experience with current sensation. Perception of the environment is studied by: a) examination of what constitutes environment, b) perceived ecosystem orientation, c) perceived environmental state orientation, or awareness, d) perceived environmental protection orientation, or attitude, e) perceived environmental value orientation, and f) perceived socio-economic-political ramifications of environment use.

As experience become less immediate, and the amount of inference by an organism increases, the process of cognition becomes involved (French 1963). *Cognition* is apprehending without the necessity of an external stimulus. It is a process by which individual acquires and applies knowledge; it includes recognition, categorization, thinking, creating and memory (Segall, et al. 1990; Shiraev and Levy 2000). Taken together, perception and cognition describes

how people perceive and experience their world and think about it. Perception and cognition are two terms, but in practice, they cannot be separated; thus the use of the term *cognitive perception* seems appropriate.

Ecosystem orientation refers to participants' knowledge (shallow or deep) of linkages between biotic and abiotic elements in an ecosystem. *Environmental state orientation (awareness)* refers to the participants' knowledge of state of environmental quality as good, polluted, or degraded. *Attitude* is defined as organization of belief/s focused on a specific object or situation (physical or social, concrete or abstract), predisposing one, i.e. the attitude holder, to respond in some preferential manner (Rokeach 1968), which can be either 'pro' or 'anti' towards the object or situation. *Belief* refers to what people think about an object or situation to be true or false, good or bad, and desirable or undesirable (Rokeach 1968). *Environmental protection orientation (attitude)* in this dissertation refers to participant's verbal expression of the need to protect environment (pro-environment attitude) based upon their environmental state awareness, i.e. belief. *Environmental values* refer to the values carried by environment in the eyes of the beholder. In broad terms, values may be *utilitarian/instrumental* and *non-utilitarian/intrinsic*. Utilitarian value is anthropocentric: judged by humans for its usefulness to humans. While, intrinsic value is non-anthropocentric and non-utilitarian. An environmental asset carries intrinsic value by its mere presence or existence. Value not only informs about the worth carried by an environmental asset, whether utilitarian or intrinsic, but also informs about some moral guidelines on how to treat nature and/or environmental asset. *Socio-economic-political ramification* refers to participants' knowledge or ability to see the socio-cultural, economic, and political linkages and consequences of environment use.

Environmental concern is a state of uneasiness, or anxiety over environment, a product of perceived environment or environmental quality degradation. Finally, *environmental behavior* is the pro-environmental action taken by research participants in response to the concern stimulated by the state of awareness of environmental quality.

1.3 Research Objectives and Alternative Hypotheses

1.3.1 Perceptions of the environment

The first research question on cognitive perception of environment in the study population is answered by the following research objectives and its alternative hypotheses.

- To study cultural consensus in the full sample on what constitutes or makes up environment.

H_{A1}: A lack of consensus is found in the study population as to what is meant by environment or what constitutes environment.

- To study the differences in the perception of the environment as defined by levels of activism/environmentalism in the full sample.

H_{A2}: A differential exists in the perception of the environment between the levels of activism in the study sample as defined by environmental orientation (ecosystem orientation, environmental state orientation/awareness, and environmental protection orientation/attitude); environmental value orientation; and socio-economic-political ramifications of environment use.

- To study the ethnic differences in the perception of the environment in the layperson sample.

H_{A3}: There are ethnic differences in the perception of the environment as defined by environmental orientation (ecosystem orientation, environmental state orientation/awareness, and environmental protection orientation/attitude), and environmental value orientation in the layperson sample.

- To study the gender differences in the perception of the environment in the layperson sample.

H_{A4}: There are gender differences in the perception of the environment as defined by environmental orientation (ecosystem orientation, environmental state orientation/awareness, and environmental protection orientation/attitude), and environmental value orientation in the layperson sample.

- To study the age differences in the perception of the environment in the layperson sample.

H_{A5}: There are age differences in the perception of the environment as defined by environmental orientation (ecosystem orientation, environmental state orientation/awareness, and environmental protection orientation/attitude), and environmental value orientation in the layperson sample.

- To study the education differences in the perception of the environment in the layperson sample.

H_{A6}: There are education differences in the perception of the environment as defined by environmental orientation (ecosystem orientation, environmental state orientation/awareness, and environmental protection orientation/attitude), and environmental value orientation in the layperson sample.

1.3.2 Environmental concerns and reported behaviors

The second research question on environmental concerns and environmental behaviors in the study population is answered by the following research objectives and alternative hypotheses:

- To study the levels of environmental concern in the study population and identify the socio-cultural correlates that explain the variance.

H_{A7}: Variability in environmental concern is a function of the following socio-cultural correlates, viz., ethnicity, sex, age, education, and levels of environmentalism.

- To study the different types of reported environmental behaviors in the study population and identify the correlates that explain the variance.

H_{A8}: Variability in the reported environmental behavior is a function of the following correlates, viz., ethnicity, sex, age, education, levels of environmentalism, and environmental concern.

1.4 Theoretical Framework

My research framework, which I call *distributive cultural psychological framework* (see Figure 1.1) is derived from theories and sub-fields in the discipline of anthropology and psychology. The anthropological borrowings include distributive model of culture (Pelto and Pelto 1975; Sapir 1938; Schwartz 1978; Schwartz 1992t), cultural consensus theory (Romney

1994; Romney 1999; Romney, et al. 1987), cognitive anthropology (D'Andrade 1995; Strauss and Quinn 1997), ethnoecology (Nazarea 1999; Nazarea, et al. 1998), and cultural psychology (Shweder 1991). The psychological borrowings include social psychology, value theory, cultural psychology, and cross-cultural psychology (Adamopoulos and Kashima 1999; Ajzen 1991; Ajzen and Fishbein 1980; Cole 1996; Rokeach 1968; Rokeach 1973; Schwartz 1970; Schwartz 1973; Schwartz 1992; Schwartz 1994; Segall, et al. 1990; Shiraev and Levy 2000; Stern 2000; Stern, et al. 1995a; Stern, et al. 1993; Taylor, et al. 2000; Triandis 1994).

In this framework “The true locus of culture is in the interactions of specific individuals, and on the subjective side, in the worlds of meanings which each of these individuals abstract [from] participation in these interactions.” (Sapir 1956 quoted in Piker 1994). Culture in this framework is both social and individual, and behavioral and psychological. Culture is perceived as consisting of characteristics assumed to be observable, such as actions, techniques and institutionalized modes of behavior (patterns of action) or, as in more recent anthropological thoughts, it is restricted to what people know, think and feel (Milton 1996).

In the distributive cultural psychological framework (DCPF), culture is viewed as embodied in a set of constructs or representations about behavioral events and classes of events. The set of constructs in the DCPF is formed or internalized by the members of a society, externalized in the structuring of events, or stored externally as artifacts or messages that are readable (that is capable of being internalized). Unlike the *fax model* of internalization in which extra-personal messages are simply reproduced in people’s psyches (Strauss and Quinn 1997), the process of internalization of culture in the DCPF is continuous in which individuals form, modify and store derivatives or representations of events (Schwartz 1978). DCPF is based on the distribution of a culture among the members of society, which takes into account both diversity

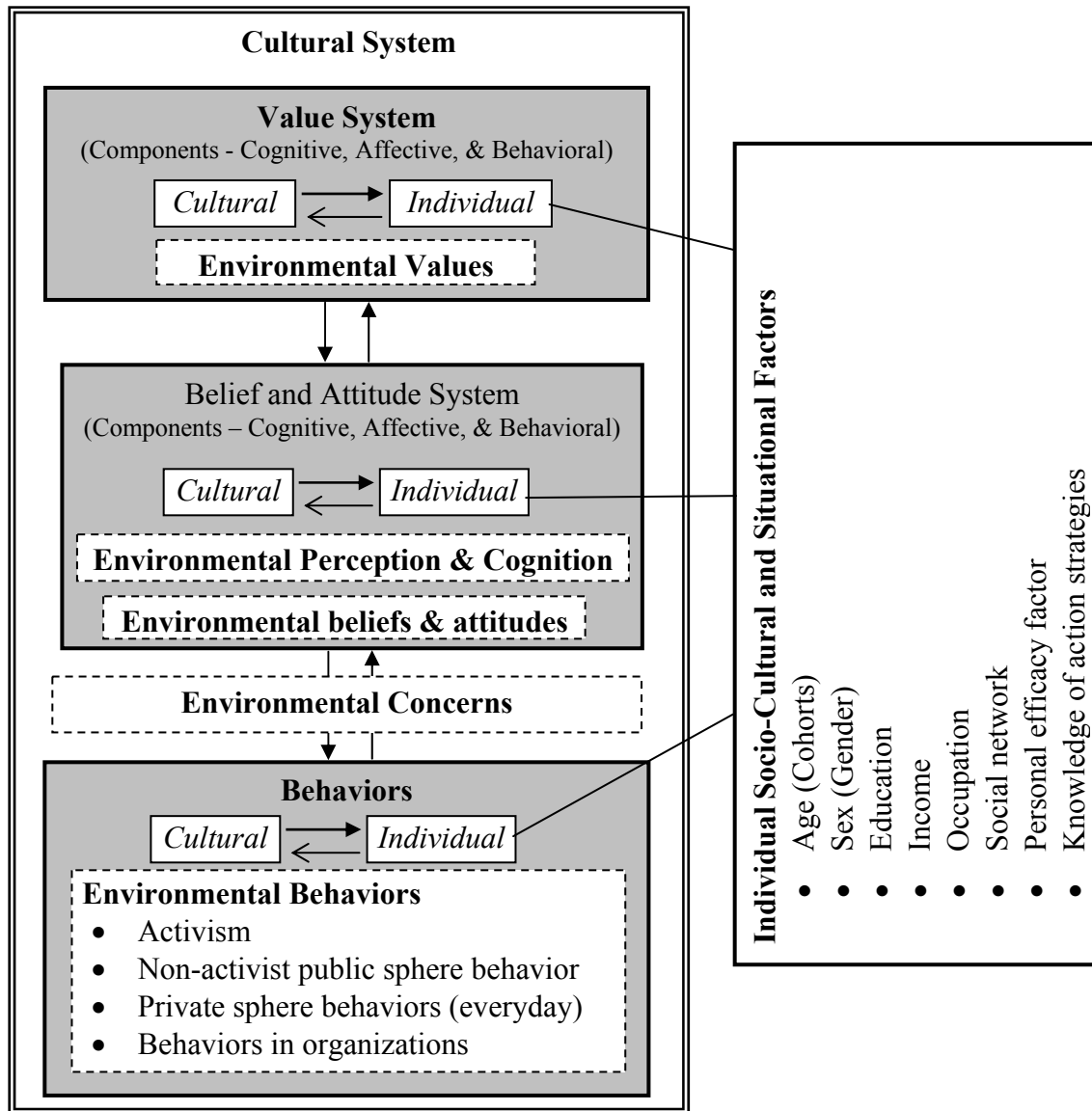


Figure 1.1: A Distributive Cultural Psychological Framework to Studying Behavior

and commonality. It is diversity that increases the cultural inventory, but it is commonality that assures a degree of communicability and coordination. Given that the relations among the members of the society are socially structured, a DCPF of culture seeks to indicate the mapping of a cultural system upon a social system, where the social structure itself is a cultural artifact, having a distributive and variable cultural base (Schwartz 1978; Schwartz 1992t). DCPF is also

sensitive to the individual socio-cultural factors, which Pelto and Pelto (1975) calls situational factors. It is *heterodox* vis-à-vis the canon of *psychic unity* (Shweder 1991), for cultural bearers cognize and behave variably, however remaining within the bounds of their culture. In DCPF a *sociocultural environment* is an *intentional or constituted world*, which are human artifactual worlds, populated with our own design, and might contain events, processes, practices, visible entities, invisible entities and crafted objects (Shweder 1991). In his cultural psychology, Shweder on intentional world writes:

The principle of intentional or constituted worlds asserts that subjects and objects, practitioners and practices, human beings and sociocultural environments, interpenetrate each other's identity... Their identity are interdependent; neither side of the supposed contrast can be defined without borrowing from the specifications of the other.... Such intentional things exist only in intentional worlds. What makes such their existence intentional is that such things would not exist independently of our involvement with and reactions to them; and they exercise their influence in our lives because of our conceptions of them (1991:74).

DCPF construes culture not merely as an integrated system, text or as a mere aggregation of behaviors, but also as a semantic population—a population of meanings—which like biological populations consists of unique and changeable entities (Rodseth 1998). Even a given word, which might seem to be a normatively identical unit, is more of a semantic bundle with a living multiplicity of meaning and accent (Volosinov 1986 in Rodseth 1998). Rodseth on distributive models of culture writes:

Words and their meanings... form a unique lexicon in every human mind. No two speakers are likely to have precisely the same lexicon, and if they did... would carry different meanings and accents for the two speakers. What is true of words and lexicons clearly applies to other components of culture as well. Such components are variably distributed within any human group, and every human being carries but a *varying fragment* of the meanings in the larger collectivity... A distributive model, then, allows anthropologists to reconceptualize cultures as variable and interactive populations of meanings, historically particular and internally diverse... a radical departure from traditional anthropological concepts that stress sharing within cultures and boundary between cultures (1998:56, emphasis mine).

Rodseth's concept of culture and boundary implies cultural identity and permeability of cultural boundary or not-so-rigid boundedness. This notion corresponds well with Milton's (1996) notion of culture and cultural perspectives. On the one hand, a culture or a cultural group is identified by its shared values, norms, beliefs, behaviors, attitudes, simultaneously. Conversely, a culture has many cultural perspectives (alternatively may be called cultural values), some of which can be cross-cultural, for e.g. environmentalism, democratic perspectives, egalitarianism/equality, self-transcendence, and altruism. This notion of cultural perspectives and permeability of cultural boundary or not-so-rigid boundary is very akin to the concept of cross-cultural validity of many value items, and basic or terminal values discussed in social psychology (Ajzen 1991; Ajzen and Fishbein 1980; Rokeach 1968; Rokeach 1973; Schwartz 1970; Schwartz 1973; Schwartz 1992; Schwartz 1994; Stern 2000; Stern and Dietz 1994; Stern, et al. 1993; Stern, et al. 1995b).

The notion of cultural perspectives rightly transits to the concept of value and value theory in social psychology. Similar to indispensability of anthropology and psychology in studying humanity/human nature, value, and value system is indispensable to a socio-cultural system. There is no society or a culture without a value system. Therefore, value is a cross-disciplinary concept and of relevance to all social sciences, namely, anthropology, sociology, psychology, philosophy, political science, ethics, and economics, among others.

Rokeach (1973, 1968) considers value to be a type of belief, centrally located within one's total belief system, about how one ought or ought not to behave, or about some end-state of existence worth or not worth attaining. Schwartz (1994, 1992) defines values as belief structures about trans-institutional goal states, varying in importance, that serve as guiding principles in the life of a person, and/or social entities.

Values, beliefs and attitudes are all organized together to form a functionally integrated cognitive system, so that a change in any part of the system will affect other parts, and will culminate in behavioral change (Rokeach 1968; Rokeach 1973). In socio-psychological environmental literature value, belief and attitude are organized hierarchically (Ajzen 1991; Ajzen and Fishbein 1980; Stern 2000; Stern and Dietz 1994; Vaske and Donnelly 1999). The generalized linkage flow in environmental social psychology is one way, which is given below:

Value → belief → attitude → concerns/behaviors

But, Rokeach's formulation, though hierarchical, is two-way, and interpenetrating. For example, an attitude is constituted of beliefs, and a belief system is constituted of values, therefore, it is a two-way or interpenetrating system. However, Rokeach (1968) places the value concept ahead of attitude concept, because: a) value is a more dynamic concept and has a strong motivational component; b) value is a determinant of both attitude and behavior, and a person possesses considerably fewer values than attitudes; and c) the value concept provides with a more economical analytical tool for describing and explaining similarities and differences between persons, groups, nations, and cultures. The DCPF also uses similar hierarchy and order of value, belief, attitude, concerns, and behavior; however, the framework is interpenetrating (as shown in Figure 1.1) and interdependent, they make up each other.

Value, belief (Rokeach 1968; Rokeach 1973), and attitude (Taylor, et al. 2000) organization is conceived to have three components, namely, cognitive, affective and behavioral. The cognitive component represents a person's knowledge and thoughts held with varying degrees of certitude, about what is true or false, good or bad, desirable or undesirable. The affective component consists of the person's emotions and affects toward the object or object of belief, around other objects (individuals or groups) taking a positive or negative position with

respect to the object of belief, or around the belief itself, when its validity is seriously questioned. The behavioral component consists of some response action when it is suitably activated. The kind of action it leads to is dictated by the content of the value and belief (see Rokeach 1973, 1968, Taylor et al. 2000). Thus values, beliefs, cognition, and behaviors are integrated and become an important aspect in the study of human nature.

1.5 Organization of the Dissertation

This dissertation is organized into seven chapters. The first chapter is an introduction to the research describing the problem statement, research questions, operationalization, and definition of terms, statement of research objectives and hypotheses, and theoretical framework.

Chapter 2 is literature review, which is divided into three sections. The first section is a review of social environmental history of new environmental movement in the US, which began in the 1960s. The section examines the genesis of the movement, the public support, the state of the movement, and role of government in support or against the movement since its beginning to present. The second section reviews social sciences research and theoretical development to explain the new American environmentalism, which is primarily found in sociology and social psychology literature. Finally, a review of anthropological involvement in the study of new environmentalism in the United States is included.

In Chapter 3, the methodologies used for data collection and its analyses are described. I begin by describing the field study area, and the institutions and communities involved in the study. I then describe the criteria used for sampling unit selection, determination of sample size, and the method of sampling. Following the sample design I outline the data collection methods, and the methods used to code and analyze the data to test the hypotheses.

I devote Chapter 4 to present the results of hypothesis testing and analyses on perceptions of the environment of the research participants by ethnicity, sex, age, education, and level of activism. I primarily use card-sort and modified thematic apperceptions test (photo-task) data sets to study the perceptions of the environment. Cultural consensus analysis is run on the card sort data to study what constitutes environment as perceived by participants. Cross-tabular analysis, analysis of variance, and least significant difference t-test are run on selected themes derived from the modified thematic apperceptions test to study the variations in the perceptions of environment in the sample. The selected themes relate to ecosystem, environmental state, environmental protection, environmental value, socio-ecological, socioeconomic, socio-cultural, and political.

In Chapter 5, I present the analyses results on environmental concerns of research participants by ethnicity, sex, age, education, and level of activism. I use data from photo-task, and semi-structured interviews to study environmental concerns in the sample and test hypothesis. Analytical methods like analysis of variance, least significant difference t-test, and cross-tabular analysis are used to study the differentials in environmental concern in the sample. Besides the levels of environmental concerns, I present the results of analysis of types of environmental degradation and the reasons for environmental concern as reported by the research participants.

Results of analysis of reported environmental behavior data are presented in chapter 6. The data for the environmental behavior analysis come from the semi-structured ethnographic interviews where I had asked the research participants to list pro-environmental behaviors practiced. The differentials in the reported environmental behavior in the sample are analyzed by ethnicity, sex, age, education, and levels of activism. Analysis of variance, least significant

difference t-test, and cross-tabular analysis are run to test the hypothesis and study the distribution of reported environmental behaviors by variables of interest. Since, little research aimed at studying correlation between environmental concern and behavior has been done, the final section of the chapter is devoted to studying the correlation between the two. I close the chapter by putting forward possible theoretical explanations for the current correlation between environmental concern and behavior in the sample.

Finally, Chapter 7 is a summary and a statement of relevance of research findings. Future research recommendations are formulated.

CHAPTER 2: AMERICAN SOCIAL ENVIRONMENTAL HISTORY AND THEORIES ON PUBLIC ENVIRONMENTALISM

2.1 Introduction

Understanding modern environmentalism in American society requires some appreciation of the historical and social context of the various manifestations of environmentalism. This chapter will first review American social environmental history, beginning with the roots and genesis of the new environmentalism which emerged during the 1960s and 1970s. The chapter then will review social science theories on American public environmentalism which grew out of the new environmentalism of the 1960s and 1970s. The review has forayed into the disciplines of social psychology, sociology, and anthropology. The third section is a review of anthropological contributions to public environmentalism, particularly in a United States context.

2.2 Social Environmental History of United States

2.2.1 Post-war America – rise of affluence, sprawl, and consumerism (1945-1960)

The United States emerged as a political, military, and economic superpower after World War II. Within a span of two decades the US underwent tremendous change at an unprecedented rate in all aspects: demographic, economic, social, cultural, infrastructural, and political. The postwar American society became an affluent, automobilized, urbanized, and sprawled consumer society. With a wartime forced savings of some \$150 billion, pent-up demands of the populace, access to easy credit, increased demand due to baby boom, and conversion of the wartime industrial production capacities to producing peacetime civilian consumer goods gave rise to the

biggest economy and the largest consumer society characterized by unrestrained production and conspicuous consumption (Clarke and Cortner 2001; Petulla 1988; Rothman 2000). In 1952, the President's Commission on Material Policy reported that the US, with 10 percent of the population and 8 percent of the land base, has become the largest raw material consumer in the non-communist world consuming nearly fifty percent of the total volume of raw material used (Clarke and Cortner 2001).

In the midst of this urbanization, there was a flight—for those who could afford the homes and travels—from urban centers to suburbs, which were safe and sanitary (Merchant 2002). America's suburban population more than doubled from 36 million in 1950 to 74 million in 1970 (Steinberg 2002). Suburban sprawl can be primarily accredited to mass production of cheap houses, growth of automobile industry, and the US government policy of road building, and federal credit/loan program for house purchase and tax breaks to allow homeowners to deduct both mortgage interest and property taxes (Merchant 2002; Petulla 1988; Steinberg 2002).

In the postwar US, one out of every six jobs was connected with the production or use of automobile, especially exploitation of resources like lead, zinc, steel, iron, aluminum, copper and oil (Petulla 1988). The automobile industry supported the nation's economy and gave its citizens jobs and freedom to where one traveled to and where one lived. With the increased auto ownership and mobility freedom millions of people moved to suburbs, went off on vacation and visited national parks (Clarke and Cortner 2001; Rothman 2000; Steinberg 2002). With increasing automobile production and low leaded gasoline prices, the nation's roads and streets became choked with traffic leading to undeniable consequences on the environment and human health (Petulla 1988; Steinberg 2002).

William Levitt, a builder, is accredited with initiating the method of factory-like methods of mass production of cheap houses (tract housing) to realize the post-war American Dream (Rome 2001; Steinberg 2002). For their mass production methods, Time magazine dubbed Levitt and Sons “the General motors” of housing; and labeled William Levitt a national hero (Rome 2001). Their method used the World War II bulldozer technology to remove whatever vegetation and level the landscape, then build house enmasse from concrete foundation to landscaped home in a 26-task factory-like process, each task performed by a different crew of workers (Rome 2001; Steinberg 2002). Since every tree was removed for mass production, the houses were exposed to more heat and cold demanding high energy consumption (Rome 2001; Steinberg 2002). With trees removed homogenous seas of green lawn were established. A smooth, closely shaven green lawn had become one of the most essential elements of beauty of a suburban house (Merchant 2002; Steinberg 2002). These manicured green lawns came at a cost of mowing, fertilizers, water, and chemicals, including DDT, impacting the environment and human health. These suburban houses were in essence constant *energy guzzlers*: energy to run automobile and power mowers, energy to keep-off cold and heat, energy to run electrical appliances, and energy to produce fertilizer and pesticides (Steinberg 2002).

During the 1950s, developers annually encroached on an area of one million acres, the size of Rhode Island, across the country using Levitt’s method of building houses (Rome 2001; Steinberg 2002). In need of fresh land, the developers entertained the idea of building on marshlands, floodplains and hillsides (Steinberg 2002). Besides automobile, the increase in suburban housing demand was because of: easy access to federal credit through the Federal Housing Administration and Veteran Administration loan programs after World War II, tax breaks to allow homeowners to deduct both mortgage interest and property taxes, and Federal

Highway Act of 1956, which provided \$50 billions over 10 years to build 41,000 miles worth of interstate (Clarke and Cortner 2001; Duany, et al. 2000; Merchant 2002; Petulla 1988; Rome 2001; Steinberg 2002). Noteworthy impact of suburban housing is the segregation of residential (low, medium, and high density, among others), shopping centers (strip malls and shopping malls), office parks and business parks, and civic institutions, liken to unmixed omelet: eggs, cheese, vegetables, a pinch of salt, but each consumed in turn, raw (Duany, et al. 2000).

Although urban sprawl, consumerism, and industrial pollution was beginning to take their toll on the populace, environment and forest, the vast majority of Americans did not perceive clean air and water as threatened (Petulla 1988). There were few governmental efforts directed to protection of environment on a national level (Petulla 1988). It is argued that the conservationist policies of the New Deal Era suffered under the Eisenhower administration. The administration is criticized for its attempt to revert to the 19th century tradition of turning over federal lands and resources to the highest bidder or those with right political connections, turn public projects to private companies and abolish a number of Federal Fish and Wildlife Service areas (Shabecoff 2003). Also, it is criticized for its attempt to veto the 10-year \$500 million grant program for states and cities under the Federal Water Pollution Control Act of 1956 (Petulla 1988).

A few clues of environmental damage were emerging that all was not well: industrial smog blanket over steel mill town of Donora, Pennsylvania in October 1947 had left 20 people dead and 6,000 ill; suds observed in sewage treatment plants and drinking water sources as early as 1947; thermal inversion on the Northeast and Midwest in 1948 trapping industrial byproducts and emissions; and by mid-1950s, smog became a symbol of Los Angeles (Long 2004; Petulla 1988; Rothman 2000). During the 1950s, more people began to notice water pollution from both

municipal and industrial sources, sickening odors and pollution slicks in rivers and streams, fish kills, and forced closures of beaches and recreation areas (Petulla 1988).

2.2.2 New environmentalism and the gospel of ecology (1961-1980)

The United States became a full-fledged automobilized suburban nation with an affluent consumer society with the highest per capita consumption rate during the 1960s. During the period 1950 and 1970 the agricultural population declined from 10 million to 4 million, while the suburban population increased from 36 million to 74 million within the same period: there were more suburbanites than rural folk (Petulla 1988; Steinberg 2002). To increase the production to feed the increasingly affluent and hungrier population and to keep the large industrial farms viable, the farms used more and more of water and artificial fertilizers and pesticides, including DDT, affecting the environment and human health alike (Petulla 1988; Steinberg 2002).

By 1970, the automobile industry had a capacity to produce 12 millions cars per year, a production rate higher than the population growth rate (Petulla 1988). In 1970, there were 100 million registered cars in the US with a population of 150 million, thus averaging less than two persons per car: theoretically every person of driving age had a car to drive (Gibson and Lennon 1999; Petulla 1988).

American society in the 1960s was remarkably optimistic, fully sure of its position, and had an abiding faith in science and technology in solving problems (Rothman 2000). Up until the early sixties, American environmentalism had primarily seen nature and its preservation as an amenity, and an object of leisure-time pursuit. A vast majority of the populace, including the critics of American society, had not perceived clean air and water as threatened (Petulla 1988; Rothman 2000; Steinberg 2002). However this perception was soon to undergo tremendous change as they learned and saw the effects and impacts of industrial and consumer culture which

began to unfold in the 1960s in its severe form. This revelation mobilized the masses, aside the mainstream environmentalists, to protect water, air, and environment: a new environmental movement was born. Unlike the first wave of conservation movement, which emphasized preservation of unspoiled natural areas or wilderness, this wave emphasized air and water pollutions, solid waste, nuclear hazard, and pesticides, among others (Carmin 1999; Rothman 2000; Shabecoff 2003; Steinberg 2002; Stern, et al. 1995b; Wells and Schwartz 1997). Unlike the first, which primarily influenced the white middle-class, this wave of environmentalism was to have a profound impact on the American society as a whole changing its cultural structure: environmental protection became a consensual issue and a basic value with shifts in linguistic and environmental conceptions and perceptions (Dunlap 1991; Kempton, et al. 1995; Rothman 2000; Shabecoff 2003; Steinberg 2002).

Although we may never fully know what caused the birth of the modern environmental movement, which appealed to the masses, certain events were influential: publication of a series of books related to environmental degradation, an extraordinary drought spell of four years, superheated political climate (civil rights, anti-Vietnam War, women's rights, Native American rights), series of ecological disasters, plus an arresting image of the Earth from Apollo 17 (Clarke and Cortner 2001; Merchant 2002; Rothman 2000; Shabecoff 2003; Steinberg 2002). Among the many causes Rachel Carson's 1962 *Silent Spring* is credited with igniting the environmental movement (Clarke and Cortner 2001; Rothman 2000; Steinberg 2002). It is considered one of the best selling books to examine human environment relationships that affected people emotionally and moved them to act (Clarke and Cortner 2001; Shabecoff 2003). It not only conveyed the hazards of chemicals, but its impact on ecological relationship using the elm-earthworm-robin food-chain or cycle, which became the driving force for the new brand of

environmentalism (Steinberg 2002). Unlike wilderness, which suggested a world apart, the word ecology suggested the reverse that all life are bound up in an intricate and interconnected relationship, including human, which helped the American society, and the world as well, awaken to the dangers of agricultural and household chemicals (Clarke and Cortner 2001; Rothman 2000; Steinberg 2002). The other publications Stewart Udall's *The Quiet Crisis* (1964), Paul Ehrlich's *The Population Bomb* (1968), Garrett Hardin's *The Tragedy of the Commons* (1968), Barry Commoner's *The Closed Circle* (1971), and The Club of Rome's *Limits to Growth* (1972) are also considered influential in the rise of the new environmentalism (Clarke and Cortner 2001; Rothman 2000; Shabecoff 2003; Steinberg 2002).

While the environmental concern and movement was gaining momentum, occurrence of a few ecological fallouts became decisive to accelerating the movement. On June 22, 1969 the Cuyahoga River caught fire once again, following the 1952 conflagration; the concentration of phenols and oil pollution were high, it burned for eight days (Steinberg 2002; Wells and Schwartz 1997). On January 28, 1969 more than 250 million gallon oil spilled into Santa Barbara channel, considered most infamous, contributing significantly to public's growing awareness (Petulla 1988; Rothman 2000; Shabecoff 2003). Pollution typically had been confined to industrial plants or poorer neighborhoods, but this spill invaded the sanctuary of privileged (Rothman 2000). Lake Erie pollution exposure that occurred during the four-year drought in the 1960s drew national attention (Steinberg 2002). Lake Erie was so polluted with coliform bacteria, soapsuds, chemical and municipal sewages from cities like Detroit and Buffalo that Time magazine called it "a North American Dead Sea" (Merchant 2002; Steinberg 2002). The other environmental pollutions that increased public awareness are: soap-suds in drinking water sources, inclusive of underground water in suburbs with septic tanks; radioactive milk

contamination in upstate New York; four-day temperature inversion and death of 80 people in New York City in 1966; pollution in Passaic River in New Jersey; contamination of food fish by mercury; dumping of toxic PCBs into the Hudson and Housatonic rivers; fouling of beaches by sewage; sewage-contaminated water in Colorado; radioactive contamination of Animas River; urban smog; radio-active fallout from nuclear testing; industrial and municipal discharge into waterways and atmosphere; and sportsmen complaint of rapidly depleting fish stocks in lakes and streams, among others (Clarke and Cortner 2001; Petulla 1988; Rome 2001; Rothman 2000; Shabecoff 2003; Steinberg 2002). These publications and ecological fallouts influenced both the public, inclusive of homemakers, and the public policy makers alike. Mother and neighborhood associations organized at the grassroots to fight the pollution, for example, the famed Love Canal. The 1960s and 1970s thus became environmentally the most active period in American history.

Rachel Carson's book had influence upon President John F. Kennedy (JFK) and his Interior secretary Stewart Udall¹ (Long 2004; Rothman 2000; Shabecoff 2003). Despite opposition, Carson's book led President Kennedy to form the President's Science Advisory Committee to investigate the effects of pesticide use, and, by the end of 1962, introduced forty bills related to pesticide regulation to state legislatures across the country (Long 2004).

John Kennedy and Lyndon Johnson² both wanted environmental protection to be part of their legacy (Clarke and Cortner 2001). Kennedy was assassinated before he could sign the Clean Air Act of 1963, however, his successor went on to sign a number of bills: Wilderness Act, Land and Water Conservation Fund Act, National Historic Preservation Act, Motor Vehicle

¹ Noteworthy, Udall was initially a dam proponent and had no knowledge on ecology. He soon became an environmentalist, wrote *The Quiet Crisis*, heated his Washington D.C. home with firewood, kept temperature at 55°F in winter, and also led members of Congress on hikes of potential national parks (Shabecoff 2003; Wells and Schwartz 1997).

² Udall was Interior Secretary to both the presidents.

Air Pollution Control Act, Water Quality and Solid Waste disposal Act, The Air Quality Act, and Wild and Scenic Rivers Act (Clarke and Cortner 2001; Petulla 1988). Even president Nixon, considered no tree hugger, found it compelling to proclaim in his February 1970 State of the Union address that the 1970s “absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters and our living environment. It is literally now or never.” (quoted in Shabecoff 2003). Historic is the passage of National Environmental Policy Act of 1969 signed in to law on January 1, 1970 by President Nixon, perhaps the greatest victory for environment (Merchant 2002; Warren 2003). The law created the Council on Environmental Quality (CEQ) in the Executive Office of the president—later replaced by the White House Office on Environmental Policy in 1993—and mandated environmental impact assessment of federal or federal supported projects (Merchant 2002; Wells and Schwartz 1997). Also, noteworthy is the creation of three federal agencies, namely, Environmental Protection Agency, National Oceanographic and Atmospheric Administration, and Occupational Safety and Health Administration under Nixon presidency (Clarke and Cortner 2001; Petulla 1988). With the Nixon presidency in a scandal, the Congress took the lead on environmental policy and enacted dozens of statutes in the seventies: the 1970s is known as the environmental decade as well as the era of environmental regulation (Clarke and Cortner 2001; Merchant 2002).

First Lady Claudia ‘Lady Bird’ Johnson emerged as the leader for the beautification movement, Keep America Beautiful campaign (Clarke and Cortner 2001; Rothman 2000). The passage of Highway Beautification Act of 1965 is considered the Lady Johnson’s legacy (Clarke and Cortner 2001). She was a primary advocate of a number of aspects of the new environmentalism like clean up of U.S. Highways, beautification of urban areas, and the

development of a beautification strategy for inner-city neighborhood and schools (Rothman 2000).

This was a time period of a generation of young people, the Flower Children Generation, raised in the postwar affluence that attacked the strictures of society, the war, and rejected the materialistic lifestyles that either ignored or harmed the environment (Clarke and Cortner 2001; Rothman 2000). This was the generation of the counterculture back-to-nature movement. These young people fled the urban areas to start their own rural communities leading a bucolic and idyllic life where they grew their own food; however, most failed (Rothman 2000; Shabecoff 2003).

Memorable is the April 22, 1970 Earth Day—conceptualized by Wisconsin Senator Gaylord Nelson and headed by a Harvard Law School student Denis Hayes—which was participated by some 20 million Americans of all ages from grammar school children to college students, who massed into streets, campuses, on riverbanks, in parks, in front of government and corporate buildings to express their anxiety and distress over the state of environment (Merchant 2002; Shabecoff 2003). They picked litters, planted trees, adorned themselves with flowers, demonstrators displayed dead fishes to symbolize contamination of rivers, and some high school kids even rode horses down a super highway, among others. Earth Day was not a spontaneous uprising, but a culmination of the ecological fallouts and public awareness. The 1970 Earth Day is considered the emergence of a mass social and cultural movement that forced open the government and industry gates to change, however slowly and grudgingly, signaling the dawn of a new environmental age (Shabecoff 2003).

Contrary to the general environmental uprising, the 1970s also saw general ambivalence with regards to behavioral changes. Public opinion became very fickle when Americans were

asked to change irresponsible environmental behavior, particularly involving automobile use in an effort to reduce auto emissions (Petulla 1988). In 1973, came the oil embargo by Arab nations on the United States under the presidency of Jimmy Carter. Throughout his presidency, speech after speech, he asked Americans to treat the crisis a moral equivalent of war and suggested to put on sweaters and turn down thermostats, but the same environmentally enthusiastic Americans weren't listening to his call—the public's attitude and behavior toward the whole energy question did not appear to change significantly (Clarke and Cortner 2001; O'Riordan 1976).

2.2.3 Anti-environmental backlash and the lull (1980-2004)

The environmentalism that had gathered unprecedented momentum in the 1960s and 1970s with a broad public support and participation slowed down since the 1980s. In fact there was a backlash from anti-environmentalist movement and the government of Ronald Reagan in particular (Long 2004; Merchant 2002; Nash 1990; Rothman 2000; Shabecoff 2003; Steinberg 2002).

The resistance to environmental regulations and federal control over resources emerged as an important issue in the guise of state rights and property rights: the Sagebrush Rebellion and Wise Use movement are noteworthy (Long 2004; Wells and Schwartz 1997). The rebellion, heir to a long tradition arguing for local control over federal lands, formally started in 1979 when the Nevada legislature passed the Sagebrush Rebellion Act claiming state sovereignty over federally owned public lands with a goal to turning it over to private and ranching interests for exploitation (Long 2004; Rothman 2000). Similar initiatives appeared in Alaska, Colorado, Utah and Wyoming legislatures; however the rebellion lost impetus throughout the 1980s (Long 2004). Wise Use movement refers to a group started by Ron Arnold, a one time Sierra Club member

turned anti-environmentalist, in 1988 based on the Wise Use Leadership Conference in Reno, Nevada (Long 2004; Wells and Schwartz 1997). The goals of the movement are to destroy and eradicate the environmental movement, open up public lands for exploitation, making economic criterion primary for decisions related to Endangered Species Act (Long 2004; Rothman 2000; Wells and Schwartz 1997).

President Reagan is criticized for being a Sagebrush Rebellion supporter: to him “Government is not the solution, it is the problem” (Clarke and Cortner 2001; Long 2004; Merchant 2002). His primary criticism is for bringing several Sagebrush rebel leaders, interested in deregulation, for environmental regulation jobs into his administration: James Watt as Secretary of Interior, Ann Gorsuch as Environmental Protection Agency (EPA) Administrator, and Robert Burford to head the Bureau of Land Management (Clarke and Cortner 2001; Merchant 2002; Rothman 2000; Shabecoff 2003). Critics are of the view that even President Clinton with a very environmentally conscious vice president had been languid, although towards the end of his administration, using the 1906 Antiquities Act, he created new national monuments throughout the West (Clarke and Cortner 2001; Shabecoff 2003). The Bush administration is criticized for taking a hostile approach to environment, like soughting to drill Arctic National Wildlife Refuge, repudiating Kyoto Protocol, and attempt to block the implementation of environmental actions taken by President Clinton (Shabecoff 2003).

The passion of the young environmentalists that swept through the nation in the 1970s in support of protecting the environment and observance of Earth Day soon died down. They went on to become self-absorbed individual seeking rewards rather than social reforms and environmental protection. However, many of them went on to provide leadership to the national environmental groups: the Third Wave that is in many ways more pragmatic and professional,

more inclined to cooperate with existing political and economic forces to achieve its goals (Shabecoff 2003). Although large number of environmental organizations, primarily grassroots, sprouted around the country, there is a lack of coordination and cooperation between the national and local, and the mainstream environmental movement and the environmental racism movement (Clarke and Cortner 2001; Shabecoff 2003). Veteran mainstream environmentalists are worried that the massive national effort to restore the quality of environment has failed or is on the threshold of failure. They are concerned that the goals and objectives are not aggressive, or even turned their back on the earlier moral vision—wondering the movement has become institutionalized and environmentalism a career, not a mission; and a profession than a religion (Nash 1990; Shabecoff 2003).

Despite this anti-environmental backlash and lull in the environmental movement, public polls show increasing American concern for the environment and their support for protecting it, even at a cost to economy: some 75 to 85 percent of the population claim or identify themselves to be environmentalists (Clarke and Cortner 2001; Petulla 1988; Thompson and Barton 1994; Vaske and Donnelly 1999). Although, environmental concern was once considered a white middleclass phenomenon with whites more environmentally concerned than blacks, later studies reveal that they are equally concerned about environment. Their concerns differed from mainstream environmental concerns by the fact that black populations were mostly residential in polluted areas (Clarke and Cortner 2001; Jones and Carter 1994; Mohai 1990; Parker and McDonough 1999; Steinberg 2002).

Critics are of the view that perhaps the seeming indifference of American public toward environment is the most damaging to the environmental enterprise (Shabecoff 2003; Steinberg 2002). But there are also claims of environmental quality improvement (Brown 2002). This may

be true to some extent from the mining and industrial manufacturing point of view, because of technological improvements and environmental regulation through command-and-control and market-based incentive approaches. However, this also has been possible by moving production facilities, pollution along with it, overseas in this age of globalization. But, given the consumer culture, there still remains the garbage, auto pollution, and deforestation problems, among others. United States each year produces more than half a ton of garbage and discards one tire for every man, woman and child a year (Clarke and Cortner 2001; Steinberg 2002). United States singly is the largest contributor to green house gases in the world. United States with five percent of the world population consumes twenty five percent of the oils consumed in the world (Appenzeller 2004; Steinberg 2002). Not only are the Americans spending more time on the road, but are also increasingly driving larger fuel inefficient automobiles: minivans, sports utility vehicle, and pickup trucks constitute some 40 percent of all vehicles sold (Steinberg 2002). It is thus not wrong to concur with Clarke and Cortner (2002) that “There is an unfinished environmental agenda in the United States...,” perhaps awaiting a political leadership and/or the Fourth Wave of environmentalism.

2.3 Theoretical Bases of Environmentalism

Since the rise of ecological movement in the United States in the 1960s, involvement of environmental social scientists to study public environmentalism proliferated since the 1970s. The field is dominated by social psychologists and sociologists. The influence of psychology is seen from its earliest work which involved development of attitude measurement scales as indicators of environmental concern (Constantini and Hanf 1972; Dunlap and Van Liere 1978b; Hoover and Schutz 1963a; Hoover and Schutz 1963b; Lee 1966; Maloney, et al. 1975; Steiner and Barnhart 1972). Literature on environmentalism can be divided into two major streams: a)

studies focusing on socio-demographic factors, and b) studies of values, beliefs, and other social psychological construct related to environmentalism (Dietz, et al. 1998). The literature review is organized along the lines suggested by Dietz et al. (1998).

2.3.1 Socio-demographic basis for environmentalism

Initial research on environmental concern primarily used socio-demographic variables as independent variables to study environmental attitudes and concerns as dependent variables. These studies were primarily questionnaire surveys focusing socio-demographic variables, like age, sex, income, education, occupational prestige, place of residence, political party, and political ideology (Van Liere and Dunlap 1980). The generally discussed hypotheses/theories are as follows:

- the age hypothesis – younger people tend to be more concerned about environmental quality,
- the social class hypothesis – environmental concern positively associated with social class as indicated by education, income, and occupational prestige,
- the residence hypothesis – urban residents are more likely to be environmentally concerned than rural residents,
- the political hypothesis – Democrats and liberals are more concerned about environmental quality than their Republican and conservative counterparts,
- the sex hypothesis - relatively few researchers paid attention; however, it was theorized that males are more environmentally concerned than females,
- the education hypothesis – higher education positively correlated with environmentalism, and
- the ethnicity/race factor – blacks rated lower than whites for pro-environmental attitudes and concerns

Age hypothesis: Initially, there were suggestions that age is positively correlated with environmental concern (Van Liere and Dunlap 1980). However, later studies concluded contrary to initial position. Among the socio-demographic variables age is stronger than other variables, and consistently found to be negatively related to environmentalism, including meta-analysis (Buttell 1979; Hines, et al. 1986/87; Mohai and Twight 1987; Van Liere and Dunlap 1980). Age is considered the most important independent variable. It is not only correlated with environmental concern, but also to other sociodemographic variables like education, political liberalism, and place of residence. Younger people has more years of formal education, age inversely related to political liberalism, and residents of non-metropolitan areas tend to be older than their metropolitan counterparts (Buttell 1979). One explanation for the age hypothesis rests on what is called age group difference, or differences associated with aging process. Since solutions to environmental problems often are viewed as a threat to the present social order, requiring changes in traditional values, habitual behaviors, and existing institutions, it is logical for youths to be perceptive to environmental reforms and accept pro-environmental ideologies more readily (Van Liere and Dunlap 1980). The other explanation for the negative age environmental concern relationship is the cohort difference (Mohai and Twight 1987; Van Liere and Dunlap 1980). It is explained that chronological age is a surrogate for cohort effects which influence attitudes toward the environment (Mohai and Twight 1987). The cohort effect is largely explained by the time period they were coming-of-age (Mohai and Twight 1987; Nazarea 1999; Nazarea, et al. 1998). The cohort difference is drawn on Mannheim's (1952) theory of generations (Van Liere and Dunlap 1980). The theory suggests that important historical events occurring at the crucial adolescent and young adulthood stage of life cycle can permanently affect a cohort throughout its existence (Mannheim 1952).

Social class hypothesis: Literature indicates that the mainstream environmentalism grew out of a white middleclass effort to preserve the world, i.e. environmental elitism. Therefore, it is hypothesized that social class indicated by income, education and occupational prestige is positively related to environmentalism (Buttell and Flinn 1978; Mohai 1985; Van Liere and Dunlap 1980). The hypothesis draws on Maslow's (1970) *hierarchy of needs theory*, assuming that environmental quality is something of a luxury, which can be indulged only after basic material needs are met (Mohai 1990; Taylor 1989; Van Liere and Dunlap 1980). However, this theory is refuted by many (Brechtin and Kempton 1994; Buttell and Flinn 1978; Mohai 1985; Van Liere and Dunlap 1980), which they ascribe to the fact that environmental activism is entirely different from environmental concern. In spite of these findings, a number of researches argue for environmental elitism, while others refute it. Mohai (1985) writes "...while activists are drawn disproportionately from the middle upper-class, environmental concern tends to cut-across all socioeconomic categories. This suggests that upper-middleclass involvement is due to factors than a unique concern for the environment by this class."

Morrisson et al. (1972) using the socio-psychological theory of *relative deprivation* presented an alternative explanation (Van Liere and Dunlap 1980). Members of lower class typically experience poor physical living conditions. Therefore, they are less aware that they live, work, and play in polluted and overcrowded conditions. The members of middle and upper class typically experience pleasant residential, work, and recreational environments, thus they are more concerned about the deterioration of the environment (Morrison, et al. 1972). Morrison et al. (1972) thus suggest that it is the relative deprivation that leads to environmental concern, not absolute deprivation (Taylor 1989; Van Liere and Dunlap 1980).

However, these positive forms of the social class hypothesis have been criticized for drawing too heavily on studies of environmental organization memberships, which may not be generalized to the mass public (Van Liere and Dunlap 1980).

Place of residence hypothesis: rural vs. urban: It was earlier hypothesized that urban residents were environmentally concerned than rural residents (Buttall and Flinn 1974; Van Liere and Dunlap 1980). The earlier explanations for urban residents being more environmentally concerned were: a) urbanites exposed to higher level of pollution and environmental deterioration, b) rural residents has a utilitarian orientation toward the nature because of their extractive occupations, and c) rural and small towns need maintain economic growth to survive, therefore they value growth over protection of environmental quality (Van Liere and Dunlap 1980). Buttall and Flinn (1974) suggested using farm and non-farm differences instead of urban and rural. However, later studies show mixed results (Freudenburg 1991). Contrary to Buttall and Flinn (1974), farmers in Chesapeake Bay were found to be equally concerned about environmental degradation (Paolisso and Maloney 2000). Similarly, a study on farmers in Austria found that the more the farmers experienced pollution, the greater their concern about environmental degradation and increased perception of environmental problems (Vogel 1996). Another study on farmer environmentalism found their acceptance of new environmental paradigm and that they are equally knowledgeable and concerned about environmental quality (Albrecht, et al. 1982).

Political hypothesis: During the period of the rise in environmentalism in the late 1960s and early 1970s, it was argued that environmental concern transcended political cleavages (Van Liere and Dunlap 1980). However, findings of later studies (Buttall and Flinn 1974; Dunlap 1975; Van Liere and Dunlap 1980) raised question on the consensual quality of environmental politics. This

led to the hypothesis Democrats and Liberals are more environmentally concerned than their Republican and Conservative counterparts (Dunlap and Van Liere 1984; Samdahl and Robertson 1989; Van Liere and Dunlap 1980). However, the coefficients are not large, indicative of a weak association at best, which support Buttlet and Flinn's (1976) assertion that political party is not a crucial variable in explaining variation in environmental concern among the general public (Van Liere and Dunlap 1980).

Sex hypothesis: During the earlier periods of the research, women were hypothesized to be less environmentally concerned than men. But, very few researchers paid attention to sex as related to environmental concerns, and there existed no stronger hypothesis (Van Liere and Dunlap 1980). However, ecofeminist writings suggest that women are potentially more environmentalist than men (Diamond and Orenstein 1990; Merchant 1979; Stern, et al. 1993). But, empirical environmental research in the 1980s on gender and environmental concern does not report consistent findings (Stern, et al. 1993), and these inconsistencies are also confirmed in a meta-analysis (Hines, et al. 1986/87). However, later research and review suggests that women expressed greater environmental concern in a local context and that women take a more pro-environmental stance, which is attributed to the higher level of altruistic value orientation of females (Dietz, et al. 2002; Mohai 1992; Stern, et al. 1993).

Education and knowledge: Besides age, education is considered the other independent variable which has strong and consistent relationship with environmentalism (Dietz, et al. 1998; Jones and Dunlap 1992; Van Liere and Dunlap 1980). Higher education and knowledge is generally hypothesized to be positively associated with environmentalism, for knowledgeable or educated people are more exposed to and able to understand environmental information (Buttlet and Johnsnosn 1977; Constantini and Hanf 1972; Jones and Dunlap 1992; Van Liere and Dunlap

1980; Weigel 1977). However, the empirical literature on the effect of education on behavior is less consistent, mixed results are found (Buttell and Flinn 1974; Hines, et al. 1986/87; Olli, et al. 2001; Van Liere and Dunlap 1980; Weigel 1977).

Religion and environmentalism: It is alleged that the Judeo-Christian worldview, as opposed to traditional non-western environmental ethics, was ultimately responsible for bringing about the contemporary environmental crisis, though some environmentally concerned Christians and Jews challenge the allegation (Meffe and Carroll 1997). Though rhetorical, the classic is the polemic *The historical roots of our ecologic crisis* (White 1967), which squarely blames Christianity for its anthropocentrism and the ecological crisis. White's thesis sparked a debate: some support it, some oppose it, and some argue that the debate is too simplistic (Guthrie 1971; Kay 1989; McHarg 1969; Moncrief 1970; Tuan 1968; Tuan 1970; Wright 1970). However, religion has received little attention as a potential influence in environmental social science empirical research programs, despite the fact that political scientists have discovered the importance of religion in American political life (Guth, et al. 1995; Van Liere and Dunlap 1980). A few studies indicate mixed results. Amongst the religious tradition, secular Americans were the most pro-environment followed by Catholics (Guth, et al. 1995). A 14-country multinational study on Judeo-Christian beliefs and environmental concerns found that a literal belief in the Bible is negatively related to ecocentric environmental concerns and positively related to anthropocentric concerns, regardless of country (Schultz, et al. 2000). Study by Hand and Van Liere (1984) indicates Judeo-Christians are generally more committed to the mastery-over-nature orientation than non-Judeo-Christians; however, the orientation varied considerably among denominations. The correlation coefficient for Episcopalians and Lutherans were consistently positive (though insignificant) with environmental concerns, while the coefficients for Baptist, Mormons and

other Sect groups were strongly negative (Hand and Van Liere 1984). However, on the contrary, Kempton et al. (1995) found that the basis of pro-environmental values for many informants with secular and non-secular religious traditions were spiritual or religious.

Ethnicity and environmentalism – blacks vs. whites: Inadequate attention has been given to ethnic differences in environmentalism. Traditionally, black environmentalism has been studied by comparing blacks with whites. By all accounts, black environmentalism is rated lower than their white counterparts (Arp III and Kenny 1996; Jones and Carter 1994; Mohai 1990; Taylor 1989). Various theoretical explanations are put forward to explain the black and white environmentalisms. The explanations of black environmentalism are grouped in three categories, namely, socio-psychological, socio-cultural, and measurement error (Taylor 1989). The primarily discussed socio-psychological theories are Maslow's (1954) hierarchy of needs and Morrisson et al.'s (1972) relative deprivation (Mohai and Bryant 1992; Taylor 1989). Hierarchy of needs theory assumes environmental issues are higher order needs or luxuries, which can only be attended after the more basic or survival needs like food, shelter, and physical and economic securities are met (Mohai and Bryant 1992; Taylor 1989; Van Liere and Dunlap 1980). The relative deprivation theory states poorer people living in poorer environmental conditions are less aware of the environmental conditions they live in, therefore they are less concerned. That is they are accustomed to degraded environment and are unaware of it. Conversely, middle and upper class people typically live in better environmental conditions therefore they are concerned about environmental quality (Mohai and Bryant 1998; Morrison, et al. 1972; Taylor 1989). This theory is, however, contrary to theory on environmental justice movement.

The socio-cultural difference explanation is tied to historical effects of slavery hypothesis, sociocultural discrimination, and civil rights movement. Historical effect of slavery

is that through slavery blacks learned that the land was a source of pain, misery, and humiliation, not of peace, and fulfillment. Thus blacks' image of the land is of hatred not love, and of servitude not ownership (Taylor 1989). Even after abolition of slavery, racial discrimination barred blacks from accessing natural recreational areas like beaches and parks. This lack of access may have historically inhibited blacks from developing interest in and appreciation of natural environment (Mohai and Bryant 1992; Taylor 1989). The civil rights movement was coincident with environmental movement of the 1960s and 1970s. Much of the black political energies were devoted to civil rights struggles, a black political agenda, and not the predominantly white dominated environmental movement (Taylor 1989).

Taylor (1989) suggests that black environmental concerns, support, and activism may have been masked by two types of measurement errors, namely, use of inappropriate indicator, and inappropriate sampling technique.

Many later studies indicate similar or higher environmental concern for blacks in comparison to white (Arp III and Kenny 1996; Jones and Carter 1994; Mohai 1990; Parker and McDonough 1999), but some study show lower black environmental concerns and behaviors than whites (Johnson, et al. 2004b). However, Parker and McDonough (1999) study shows similarities in their environmental concerns, but shows difference in their reported behavior—the relationship of powerlessness to environmental behavior was stronger for African Americans than Euro-Americans. This difference in black and white environmentalism is explained with the *barriers theory*, which suggests that blacks and whites have similar environmental attitudes, but due to differences in participation style, barriers to joining environmental organizations, and feelings of disenfranchisement and powerlessness, blacks are less likely to act on their environmental concerns (Parker and McDonough 1999).

2.3.2 The post-materialist value theory

The political scientist Ronald Inglehart (1977, 1990), based on Maslow's hierarchy-of-needs theory explained environmentalism as a post-materialist value shift, thus *the post-materialist value theory*. However, data on this hypothesis are fragmentary and inconsistent, and challenged by cultural theorists, anthropologists and sociologists (Brechtin and Kempton 1994; Dunlap, et al. 1993; Ellis and Thompson 1997; Grendstadt and Selle 1999; Grendstadt and Selle 1995; Mohai 1990; Steg and Sievers 2000; Stern, et al. 1995b; Vogel 1996)

2.3.3 Socio-psychological basis for environmental theory

Theorizations on environmentalism using socio-demographic variables have been criticized for being atheoretical, primarily their lack of incorporation of social psychology. They were criticized for lack of attitude-behavior relations, and linking environmental attitudes and beliefs to broader worldviews, values or the influences of social structure (Heberlin 1981; Stern and Dietz 1994; Stern, et al. 1995b). This led to the development of "social psychological model". The attitude formation in the socio-psychological model is theorized on the basis of value as the guiding principle for action and developing and maintaining attitudes toward relevant objects and situations.

The generalized socio-psychological model may be expressed as: value leads to belief, belief in turn leads to attitude, and attitude leads to environmental concerns and behaviors (Stern 2000; Stern and Dietz 1994; Stern, et al. 1993; Stern, et al. 1995b; Vaske and Donnelly 1999). The socio-psychology model is largely based on *the norm activation model* (Schwartz 1970; Schwartz 1977), and *the theory of reasoned action*, later renamed *the theory of planned behavior* (Ajzen 1991; Ajzen and Fishbein 1980; Fishbein and Ajzen 1975). Stern (2000) calls his theory

value-belief-norm theory of environmentalism, and Vaske and Donnelly (1999) calls their theory *the cognitive hierarchy model* of human behavior.

The socio-psychological model is a constructivist approach to attitudes in which individual attempts to take account of their personal values within a value expectancy calculus that economizes cognitive effort. Values may provide a social amplifier for available information, and values may also act as filters for information, influencing beliefs by leading people to accept information selectively when it seems consonant with their values. It is presumed that value orientations take shape during the socialization process and are fairly stable in adults. Value orientations are not mutually exclusive, and value orientations may vary across individuals, social-structural groups, and cultures (Stern and Dietz 1994).

In socio-psychological theory, the guiding factor is the environmental value orientations. The literature indicates three value orientations: a) egocentric/anthropocentric/homocentric, b) altruistic/social-altruistic, and c) biospheric/biocentric/ecocentric (Merchant 1990; Stern 2000; Stern, et al. 1993; Stern, et al. 1995b; Vaske and Donnelly 1999). Amongst these values, biocentric value is the most pro-environmental, which recognizes that all things, human and non-human, in nature have equal rights. Altruistic/social-altruistic value also disposes people to pro-environmental concerns and behavior. However, it is the anthropocentric value, which gives primacy to human interests, is the most damaging to environment. To note, the anthropologist Kempton and company (1995) found similar value orientations responsible for environmental concerns.

2.3.4 Anthropology and environmentalism

If *culture* is *the mechanism* through which humans interact with or adapt to their environment, then the whole field of anthropology can be characterized as human ecology

(Milton 1993). But, this is not how it has been defined and practiced through out its history. However, Julian Steward's *Cultural Ecology* paved way for the emergence of *Ecological Anthropology*. It is defined as the study of the relations among the population dynamics, social organization, and culture of human populations and the environment in which they live (Orlove 1980). By definition, be it *culture* or *ecological anthropology*, environment ought to be an important component of anthropological inquiries. However, paradoxically, no anthropologist took an interest to examine the ecological movement of the 1960s and 1970s, except Mary Douglas, as a *cultural-ecological phenomenon/movement*. Ecological anthropologists in particular wanted to distance themselves from the popular ecological movement of that time period (Rhoades 1992). This perhaps was due to: first, anthropology was used to studying small scale non-western societies, and second, the discipline did not have the experience or the methodology—the closed-ecosystem and subsistence oriented methodology was inappropriate to study the large scale non-subsistence oriented movement. With theoretical paradigmatic changes, the old ecological anthropology of the 1960s and 1970s gave way to *new ecological anthropology*, or *environmental anthropology* as some call it. Although a late comer, the post-structuralist and post-modernist theories informed environmental anthropologists embarked upon studying environmental movement or environmentalism as a socially constructed phenomenon with an emphasis on issues of power and inequality, development, social movement, and protected areas, primarily in a globalized Third World context (Brosius 1999a). Public environmentalism in general and American public environmentalism in particular remains untouched, except for a few cognitive anthropologists.

Parallel to value orientations in socio-psychological model, Palsson (1996) identifies three human-environmental relation paradigms, namely, environmental orientalism,

environmental paternalism, and environmental communalism. However, no empirical research is found in the light of these paradigms in the US. The best established and most consistent application is the *Cultural Theory* found in the work of Mary Douglas and of those who use her ideas (Milton 1996). Cultural theory, using two variables *group* and *grid*, derives four types of culture, namely, hierarchical, individualistic, egalitarian, and fatalistic (Douglas 1970; Douglas and Wildavsky 1982). As per cultural theory, there are four myths of nature, namely, nature capricious, nature perverse/tolerant, nature benign, and nature ephemeral (Steg and Sievers 2000; Thompson, et al. 1990). Cultural theorists show that since egalitarian cultural type believes nature ephemeral, they are disposed to pro-environmental behaviors. Douglas and Wildavsky (1982) using this theoretical framework suggest that the rise in American environmentalism in the 1960s and 1970s were related to sectarian organization (Milton 1996). Proponents of the cultural theory claim that egalitarianism is very much the heart of today's environmental movement, which better explains the variance than other theories, especially the postmaterialism, and other correlates or variables of environmentalism (Ellis and Thompson 1997; Grendstadt and Selle 1999; Grendstadt and Selle 1995; Steg and Sievers 2000).

The other anthropological work is that of Willett Kempton et al. (1995) where they studied American environmental values, and cultural models of nature, weather and atmosphere, and policy reasoning. The values identified by Kempton et al. (1995) are akin to values mentioned by social psychologists. They conclude that Americans' derive their environmental values from three sources: a) religion, b) anthropocentric (human centered), and c) biocentric (living thing centered).

The present dissertation aims to address some of the gaps in the anthropology of everyday environmentalism. Given the amount of sociological and social psychological research

work on public environmentalism, I draw heavily on social psychology and sociology but within a context of culture. The theoretical basis and the dissertation research framework are based on sociology, social psychology, and anthropology. But, the research methods, sample design, and data collection and preparation for analysis are anthropological; although, qualitative and quantitative (statistical) techniques of data analyses are used.

CHAPTER 3: METHODOLOGY

3.1 Introduction

After the dawning of the *new environmentalism* in the 1960s, especially after the First Earth Day, April 22, 1970, public concern for environmental quality has been of interest to both polling organizations and social scientists alike. Gallup organization took its first poll in late April 1970 after the First Earth Day (Mitchell 1979). Although, social scientists had been involved since the mid-sixties in the study of public attitudes on environmental quality, their involvement proliferated in the 1970s (Dunlap and Van Liere 1978b).

Social science research on public environmentalism is dominated by sociologists and social psychologists. From the beginning, the methods utilized had been influenced by social psychology. For example, the earliest works were related to development of attitude measurement scales and its study, which latter expanded to concerns and behaviors (Dunlap and Van Liere 1978b; Hoover and Schutz 1963b). The primary strategy in the study of public environmentalism is to treat environmental concerns and environmental behaviors as dependent variable and predict them with a set of independent variables: sociodemographic, attitudes, personal norms, values, past behavior, efficacy factors and locus of control in various combinations (Axelrod and Lehman 1993; Corraliza and Berenguer 2000; Hallin 1995; Hamid and Cheng 1995; Hines, et al. 1986/87; Samdahl and Robertson 1989; Schultz and Oskamp 1996; Sivek and Hungerford 1989/90; Stern and Dietz 1994; Stern, et al. 1993; Vogel 1996).

Very few anthropologists are engaged in studying public environmentalism in western societies. Given the domination by sociologists and social psychologists and the nature of

research strategy, research on public environmentalism is entirely questionnaire based, whether mailed or telephone survey. Few studies use ethnographic methods. Anthropologists Willett Kempton, James Boster and Jennifer Hartley (1995) used a combination of semi-structured interviews and questionnaire survey to study cultural models of nature, environmental concerns, weather and the atmosphere, and environmental values in the American culture. The human geographer Hallin (1995) used a combination of ethnographic interviews and questionnaire survey to study recycling behavior in Foley, Minnesota. Anthropologists Michael Paolisso and R. Shawn Maloney (2000) used ethnographic methods to study farmer environmentalism in relation to dinoflagellate bloom in the Chesapeake Bay Area.

Given the nature of ramifications of environment use, the questionnaire survey method alone is constrained due to its structured nature. The close ended nature of questionnaire survey severely limits the identification of intervening variables, unless the researcher has a full knowledge in advance. Given the limitations of questionnaire survey and the objectives of the dissertation research, a combination of ethnographic and cognitive methods is used for data collection. In particular, semi-structured ethnographic interview, slip sorting, and modified thematic apperceptions test (MTAT) are used.

Open-ended/unstructured nature of semi-structured ethnographic interview and MTAT gives the participants a greater control and thus enable the researchers to get a greater depth into the topic under investigation. Another added advantage, especially MTAT, is that little prompt need to be given to the participants in terms of questions. For example, questionnaire has a direct question and the participants are, in a way, forced to answer in the structure of the questionnaire. The unforced and unstructured nature of the MTAT, except for the visual stimuli, makes it particularly appropriate for studying perceptions of the environment. Verbal approaches,

questionnaire or semistructured, to study the perceptions of the environment is less effective. The use of visual stimuli in the form of photographs makes MTAT an appropriate method to study environmental perceptions. Since perception is very closely related with cognition, in essence inseparable, use of visuals appropriately stimulate the cognitive system and enable effective elicitation of perception.

3.2 Study Area and Participating Communities/Institutions

The geographic location of the dissertation field site is Clarke County, Georgia, where I conducted research from January 2003 to March 2004 (Figure 3.1). Clarke County is popularly known as Athens-Clarke County because of the unification of the Athens City and Clarke County governments. Clarke County was purposively selected for a number of reasons. The composition of black and white population in Clarke County (27.3% black & 64.9% white) is identical to state population composition (28.7% black & 65.1% white). The population composition also made it feasible to operationalize the ethnic variation component of the dissertation research. The county has urban, suburban, and rural-like areas on the fringe. The county thus has a mix of poor and middle-class population making it suitable for study. Additionally, there are numerous nonprofit environmental organizations, which allowed inclusion of activist environmentalists in the sample for comparison with laypersons. Clarke County has a geographical area of 121 mile² and a population of 101,489. The population is primarily white (64.9%) and black (27.3%) followed by Hispanic (6.3%), and Asians (3.1%) with a population density of 840.2 persons/mile².

I worked through neighborhood associations and a church to recruit research participants. The participating communities and institutions were: Federation of Neighborhood Associations (FNA), Athens; Cedar Creek Civic Association, Athens; Concerned Citizens of North Athens-

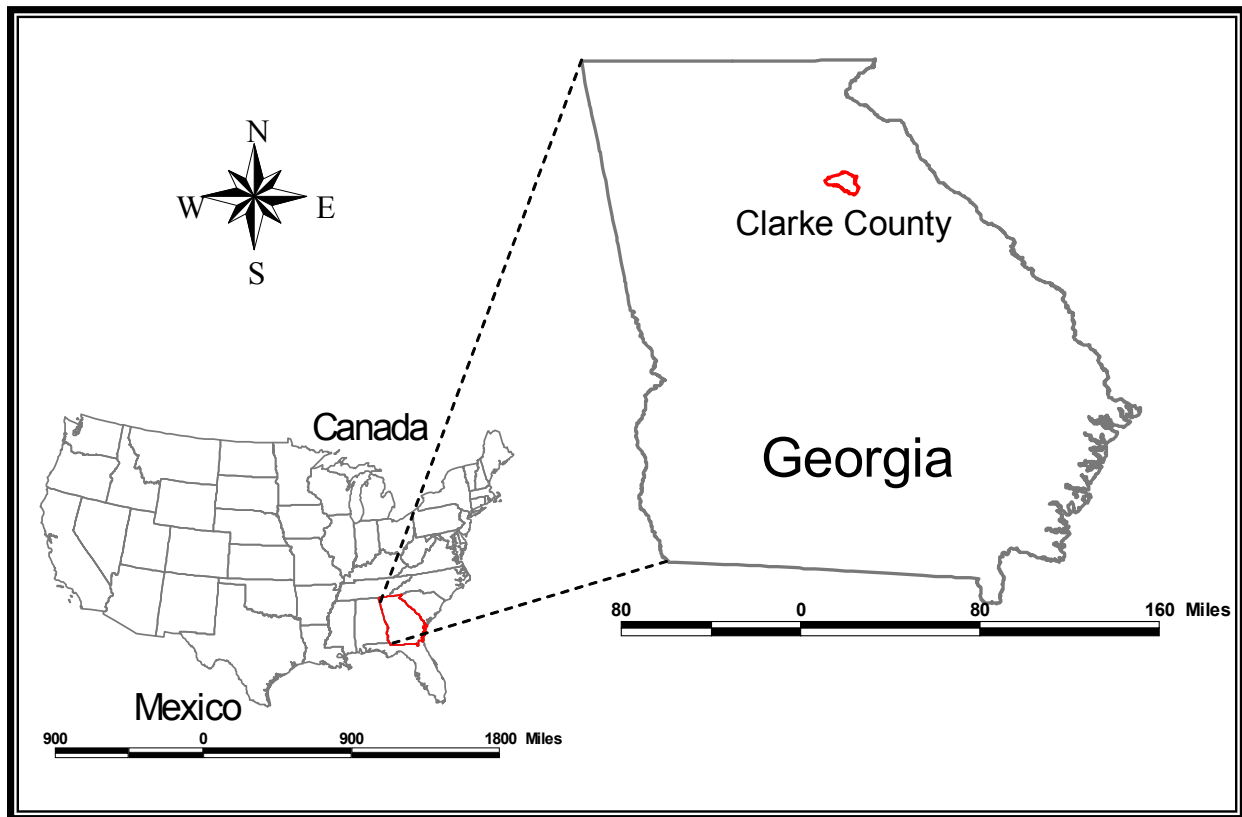


Figure 3.1: Map of Georgia showing the location of Clarke County

Clarke County, Athens; Historic Boulevard Neighborhood Association, Athens; and United Methodist Church, Winterville. I primarily communicated through the presidents of the associations and the church pastor to make contacts with informants.

FNA is comprised of 23 neighborhoods in Clarke County. The federation meets every first Monday of the month at the Presbyterian Students Center. The meeting usually invites a speaker from various areas, ranging from health, to transport and planning, including clean air and human health. The meeting is represented by member neighborhoods; however it is open to the general public and non-member neighborhood associations, as well. Among these neighborhoods, two were selected for in-depth study: Cedar Creek Civic Association and Historic Boulevard Neighborhood Association. Also, one non-FNA member neighborhood

association, the Concerned Citizens of North Athens-Clarke County, was selected to recruit black research participants.

Cedar Creek Civic Association is made up of families living in the Cedar Creek Subdivision in East Athens. The association is a member of the FNA. The neighborhood is primarily comprised of white upper-middle class families. The board of the association meets every third Monday of the month in the president's house. The meeting discussion covers almost any topic, such as rental registration, zoning and development, noise ordinance, sign ordinance, neighborhood cleanliness, neighborhood social events, and road widening, among others.

Historic Boulevard Neighborhood Association, also a member of FNA, is located in the north-west part of Athens. Memberships of the association are primarily composed of white lower- to middle-class families. The association meets every Saturday morning with participation from board members and general members. The meeting will discuss any topic related to the neighborhood or rules and regulations that affect the neighborhood, for example rental registration, leaf blowing, zoning, sidewalks, and traffic among others.

Concerned Citizens of North Athens-Clarke County is an association of families resident in the neighborhoods of north Clarke County. The association is not a member of the FNA. The membership is primarily composed of poor black families to a few middleclass black families. The association meets every second or third Thursday of the month attended by blacks, although there is a white upper middle-class neighborhood in the vicinity. The discussion of the meeting is mostly dominated by drinking water line, fire station and other developmental and social issues those are related to improving living conditions or improving socioeconomic conditions like social security, Medicare, sewage, and passing on civic and political information to participants.

In addition to the neighborhood associations and the church in Winterville, I worked through two environmental organizations, namely, Athens Grow Green Coalition (AGGC) and Upper Oconee Watershed Network (UOWN) to recruit research participants. The mission of the AGGC is to promote responsible community development and growth management policies and practices that protect natural resources, prevent sprawl, maintain a healthy economy, and preserve a high quality of life for all in the Athens region. Unlike most non-profit environmental organizations, the AGGC has integrated social issues like affordable housing into the overall goal of the organization besides environmental activism. Unlike AGGC, the mission of UOWN is purely environmental related to watershed and water quality. The mission of UOWN is to protect and improve water resources and stream health in the Upper Oconee Watershed through community-based advocacy, monitoring, and education.

3.3 Sample Design

Convenience and snowball sampling procedures were adopted to select research participants (Bernard 1995). The total number of sample was determined based on ethnicity (black and white), sex (male and female), age groups (20 to 40 years, 40 to 60 years, and >60 years) and chi-square criterion of minimum number of observations in each cell. For a valid chi-square test, it requires a minimum cell frequency of five (Frankfort-Nachmias and Rodeghier 1997; Madrigal 1998). Given these sampling criteria the determined sample size was sixty ($2 \text{ ethnic groups} * 2 \text{ sex categories} * 3 \text{ age groups} * 5 \text{ sample per cell} = 60$). Based on chi-square and sex criteria, a sample of size ten for activist environmentalists was determined, which gave a final sample size of seventy. Once the sample size was determined, and the categories known, the sample design became more like a quota sampling, but adopting convenience and snowballing procedures to reach the required sample size (Babbie 1998; Bernard 1995;

Thompson 1997). During the field work a total of seventy nine participants were interviewed. The distribution of the sample is presented in Table 3.1.

Table 3.1: Sample distribution for qualitative survey (Age*Ethnicity*Sex)
(n=79)

Age group (years)	Black		White		Activist Environmentalists	
	Male	Female	Male	Female	Male	Female
18-40	4	5	6	5	6	6
40-60	5	5	8	6		
>60	7	5	5	6		
Sub-total	16	15	19	17	6	6

Initially, activism was classified into two levels; namely, activist and non-activist for sampling purposes. Non-active members of environmental organizations, and persons or professionals with science and environmental background were not considered. Therefore, for analytical purposes, it was necessary to classify or categorize the sample into three categories or levels of activism. The sample was thus divided into three groups: a) activist environmentalists (ACTV), b) non-activist members of environmental organizations and professionals with science and environmental background (NM/PF), and c) non-activist laypersons (LAYP). Sample distribution by level of activism, sex and ethnicity for the qualitative survey is given in Table 3.2.

Table 3.2: Sample distribution for qualitative survey (Level of activism*Sex*Ethnicity)
(n=79)

Sex	Levels of activism	Ethnicity		Row Total
		Black/ Afro-American	White/ Euro-American	
Female	Activist environmentalists (ACTV)	0	6	6
	Non-activist members/professionals (NM/PF)	0	10	10
	Lay persons (LAYP)	15	7	22
	Sub total	15	23	38
Male	Activist environmentalists (ACTV)	0	6	6
	Non-activist members/professionals (NM/PF)	1	11	12
	Lay persons (LAYP)	15	8	23
	Sub total	16	25	41
Column Total		31	48	79

3.4 Data Collection

3.4.1 Life history interview

I initiated the qualitative survey with life history interview. After reading out the purpose of research, signing the Human Subjects Consent Form, and seeking permission to audio-record the interview, the research participants were asked to tell their life history. The interview was primarily designed to serve as an ice-breaker and to obtain background information on research participants or information the participants wanted the researcher to know, which could be later used during data analyses. Although I had prepared a checklist (Appendix 3.1), a free rein was given to research participants to tell their stories from childhood to present covering education, family values, political and religious orientations, places lived, jobs held, and hobbies.

3.4.2 Card sorting for consensus analysis on environment

After life history interview, the research participants were asked to sort a deck of cards to study cultural consensus (Romney 1999; Romney, et al. 1986) among the research sample on what they understand by the term environment or what makes up or constitutes environment. A total of sixty eight items to represent environment, starting from microorganisms to large natural bodies like ocean and sun, were used to discern what they understand or mean by environment (see Appendix 3.2). I printed the items on cards and asked the participants to sort them into two piles: environmental pile and non-environmental pile (see Appendix 3.1). After the card sorting exercise, if they ended up dividing the cards into two piles, they were asked to explain the basis for the division. For clarity purpose, I asked them what they meant by environment, whether differentiate nature and environment, and built and natural environment or not. All research participants were presented with cards in the same order. They were ordered alphabetically.

3.4.3 Modified thematic apperception tests/Photo-task

After the card sorting exercise, I administered the photo-task or modified thematic apperceptions test (De Munck and Sobo 1998; Nazarea 1999; Nazarea, et al. 1998; Peltó and Peltó 1978) to study research participants' perception of environment beyond what is meant by environment. Based upon my academic training, and interactions with fellow students and members of environmental organization I used a set of seventeen pictures representing flora, fauna, and American landscape for the MTAT (see Appendix 3.3). Another basis for selection of the pictures was the degree of obviousness of environmental degradation or pollution. For example, pollution is obvious in pictures of landfill and factory; it is less obvious in pictures of strip mall and poultry houses; and least obvious in pictures of swamp, stream, and arid scene. After handing them the pictures, they were asked to go picture by picture, tell the theme, make comments, what comes to their mind, or the upsides/positives and downsides/negatives of the picture or the theme associated with the picture (see Appendix 3.1). All research participants were presented the pictures in the same order.

3.4.4 Semi-structured interview

The photo-task was followed by an in-depth semi-structured interview. A printed checklist was used to guide interviews (see Appendix 3.1). The content of the interview revolved around environmental value, nature of environment, human-environment relationship, human's right to use natural resources, environment quality and factors affecting it, concerns about environment, environmental behaviors, global and local environmental link, among others. Always, in the end I asked if they would like to add something that the interview did not cover, or something that s/he felt was important that I should know.

3.4.5 Observation and participation

Given the spread out community settlement pattern of the Clarke County, and the nature of research question, a different kind of participant observation was pursued. The private sphere behavior (for example, water and electricity conservation, car driving habit, food wastage, purchasing behavior, and reusable bags for grocery shopping, among others) of the research participants is difficult to observe and can be obtrusive and offensive, especially in a society where privacy is of import as a personal right. However, as a resident of Clarke County I was able to attend monthly meetings of neighborhood associations for a period of ten months: January 2003 through October 2003. Also, I attended two social events at the Winterville United Methodist Church, where I was able to contextualize better religion and environmentalism. I went to three public hearings related to rental registration, Louisiana Pacific plant expansion, and Certain Teed plant expansion. During the 2004 election year, I had opportunity to attend three election forums for candidates at the county and state level elections organized by Athens Grow Green Coalition and Federation of Neighborhood Associations. Additionally, I participated in a number of environmental events for public participation organized by local environmental organizations in Athens. I attended two River Rendezvous events, a one half-day long event, organized by Upper Oconee Watershed Network, which particularly involved water sampling, trash collecting, and making a visual assessment of the stream and its surroundings. I attended another one half-day long Water Festival organized by UOWN. The festival was primarily educational with stalls and demonstrations for the public. I attended a one-half day long Rivers Alive program organized by Sandy Creek Nature Center, Georgia River Network and other environmental organizations in the county. Rivers Alive is a waterways cleanup event of

collecting trash in the river, on river banks, and in the woods by the roadways or greenways. I also subscribed to email listserv of AGGC and UOWN to learn their nature of use of listserv.

3.5 Data Coding and Analytical Methods

3.5.1 Card sort coding and cultural consensus analysis

The cards sorted into the environmental pile were entered '1' and the cards sorted into the non-environmental pile were entered '0' in a spreadsheet, which were later imported into SPSS. Also relevant socio-demographic information was added into the spreadsheet. Of the 79 interviewed, I had 76 usable card-sorting exercise data for cultural consensus analysis.

3.5.2 Photo-task transcription coding

Since photo-task was open-ended, I had to take a different coding approach than used in the semi-structured interview. I selected ten interview transcriptions, read them, and noted the emerging themes from the interview transcriptions. I re-read the ten interviews twice to verify the themes and also to check and maintain consistency in thematizing the responses. I coded for fifty three themes, which were broadly comprised of socio-cultural, environmental/ecological, socio-cultural, political, socio-economic, and economic categories (see Appendix 3.4). A particular theme was scored only once for a picture, although the theme would come up more than once while discussing or commenting on that particular picture. I developed a numeric coding scheme for these themes and then entered them into a statistical program database. After the data entry, a count for the themes were performed across the seventeen narrations, for all the research participants, to determine what frequency a particular theme had been coded or scored in total. This new variable thus gave a total count for a theme, which I used for studying the perceptions of environment, environmental concerns, and others using appropriate analytical

techniques. I also entered socio-demographic information of research participants obtained from life history interviews into the database for analyses purposes. Of the 79 interviews, I had 72 usable interviews due to tape recording problem.

3.5.3 Semi-structured interview transcription coding

Coding semi-structured interviews were straight-forward than the photo-task interviews. As I read the transcriptions, I textually coded them and entered them into a spreadsheet for content analysis. I also entered their corresponding socio-demographic information from life history interviews into the database for studying correlation between variables of interest.

3.5.4 Variations in the perception of the environment

Perception of the environment is a field of enquiry in the disciplines of anthropology, geography, and environmental psychology. A number of techniques are used to study perception of environment ranging from interviews to photographs/photo-slides to survey questionnaires and sketching among others (Gifford 1997; Lowenthal 1967; Nazarea, et al. 1998; Polinard 1979; Saarinen 1969). A sample of the methods used by various authors are: Appleyard et al. (1967) used a combination of film, photograph and sketch to study aesthetics of urban highways; Austin (2003) used ethnographic interview to study coastal environment; Beck (1969) used symbols to study spatial meaning; Bertolas (1998) used a combination of taped interviews and questionnaire to study perception of wilderness; Nazarea et al. (1998) used MTAT to study intra-cultural variations in perception of natural resources; Polinard (1979) used questionnaire to study environmental attitude and perception of environmental problems; and Sonnenfeld (1969) used photo slides to study environmental perception and adaptation in arctic. I used a combination of card sorting, MTAT, and semi-structured interviews. Following is a description of the methods used to study environmental perception in the sample.

Cultural consensus analysis: Cultural consensus analysis (Borgatti 1996; Romney 1999) was performed on data obtained from card sorting exercise. I complemented the results of cultural consensus analysis by running hierarchical cluster analysis on the factors extracted in the cultural consensus analysis to study how the respondents clustered and what explained the clusters (Aldenderfer and Blashfield 1984; Richardson, et al. 1996)

Levels of environmental orientations: Variations in the perceptions of the environment in the sample were studied by examining the level of environmental orientation as defined by ethnicity, sex, age, education, and levels of activism. Variation in the environmental perception as defined by levels of activism was studied in the full sample ($N_{full} = 72$), while variations in the perception of the environment as defined by ethnicity, sex, age, and education were studied in the layperson sample ($N_{lay} = 41$). Seven themes (Table 3.3) from the MTAT transcriptions were selected to study the levels of environmental orientation in the sample. Analysis of variance (ANOVA) was run to test the hypothesis of difference in the groups score means, and least significant difference (LSD) t-test was run to complement the ANOVA results (Bhattacharyya and Johnson 1977; Nazarea 1999; Nazarea, et al. 1998; Norusis 2000; SPSS 1997).

Table 3.3: Themes selected to study levels of environmental orientation

Sl.	Themes	Type
1	Ecosystem orientation	Ecological (knowledge)
2	Environmental state orientation	Envtl. state (good/bad)
3	Environmental protection orientation/attitude	Attitudinal (protection)
4	Communalism	Ethical (protection)
5	Spiritual	Ethical (protection)
6	Stewardship	Ethical (protection)
7	Humane treatment of animals	Ethical (treatment)

Ecosystem orientation was coded when the research participants talked about relationship between biotic and abiotic elements in the ecosystem. Ecosystem orientation was not coded when the participants made simple environmental degradation or pollution statements like, landfill pollutes water, chemicals pollute environment, or car exhaust pollutes air. It was coded

when they explained process or demonstrated some form of knowledge of linkage between the elements of ecosystem. For example, ecosystem orientation was coded when the research participants talked about or used terms like: ecosystem, ecology, food chain, chain reaction, balance of the system, good ground coverage to stop soil erosion, plants and animals have a purpose/role, each one plays a significant role in life cycle, invasive species, adaptation, biodiversity, global warming, hunting helps animal management, run off from paved surfaces cause water pollution and flooding, and underbrush build up causes forest fire, among others.

Environmental state orientation/awareness does not refer to whether a person is environmentally concerned or not, but denote whether s/he is aware of environmental condition/quality or not. Environmental state orientation was coded from the MTAT transcriptions when a participant spoke about the positive (good environment) or negative (polluted environment) aspects of the environment, or both. It was scored only once for a picture.

Environmental protection orientation/attitude was coded when the participants expressed the need to protect, preserve, or conserve environment. For example: human can't take up every inch of earth and just use it all for us, wildlife should have a place to be able to call home, we need some areas to preserve the balance of nature; that is wasteful; wise use; need to do more recycling; we can focus on mass transit to save oil; it is a waste of water; mountains and forests ought to be preserved for beauty, for posterity and history; and we don't have enough old growth forests they should be set aside, among others.

The ethical or moral basis for environmental protection orientation was primarily utilitarian-conservationism or ecological-anthropocentrism. Besides this ethical/moral basis participants reported other four bases, namely, stewardship, communal, spiritual, and humane treatment of animals. *Stewardship* was coded when the research participants categorically used

the term stewardship or when they said that we should take care of plants, animals, and land among others. The basis for this ethical code was either biocentric or religious. *Communalism* was coded when participants reported that animals and plants have equal right to be on this earth as humans; the basis for which was also either biocentric or religious. When the participants invoked God, Bible or their religious belief as a basis to use or treat the environmental resources, be it floral, faunal, or physical, *religious* was coded. *Humane treatment* was primarily associated with mass chicken production. It was coded when the participants said that the animals are treated bad, and given hormones to grow fast, among others.

Environmental values: Nature carries different values in the eyes of the beholder. Therefore, the primary purpose of coding environmental value was to study what values are carried by environment in the eyes of the research participants. I coded for the following twelve values from MTAT transcriptions: 1) beauty, 2) ugly, 3) ecological, 4) heritage, 5) intrinsic/existence, 6) psychospiritual, 7) consumptive, 8) recreational, 9) medicinal, 10) educational/scientific, 11) negative, and 12) spiritual/religious.

Presented below is the coding scheme used to code these twelve value items from the MTAT transcriptions of the research participants.

Beauty or ugly was coded when the respondents said the picture or the environmental object in the picture is beautiful or ugly. Here beauty and ugly largely refers to pleasing or non-pleasing quality or qualities of the picture or object to the eyes only. However, respondents also referred ugly to something they did not like, for example the traffic jam in the highway, poultry production facility, and industrial plants.

Ecological value refers to ecological functions and services of environment. It was coded when the respondents brought up topics like trees cleanse air by taking up carbon dioxide,

trees/grass hold soil, wetlands work as filters, wetlands help recharge ground water, wetlands and forest provide habitat for animals, and food chain, among others.

Heritage value invoked by research participants included cultural and environmental historical values. Examples for heritage value includes: crop agriculture and cattle pasture rural South culture; redwood as national heritage; historical values of natural and/or environmental objects like Grand Canyon, redwood trees among others.

Intrinsic/existence value refers to the right of the nature to exist by itself, irrespective of its usefulness to human. This value is derived by the mere existence of the natural/environmental object in question. Intrinsic value was coded when research participants said they have intrinsic value, or when they said they have a right to live as a member of the biotic community, by being natural it is serving its purpose, and that is the way it should be, among others.

Psychospiritual value is beyond simple beauty or pleasing to the eyes only quality. It is altogether a different experience which is pleasing, recreating, and relieving of mind and spirit. It is less of a utilitarian (economic) value. Thus it is in this sense psychospiritual value was coded.

Consumptive value is utilitarian value and anthropocentric, which refers to direct consumption of environmental resources in material terms. Examples of consumptive value are: grains, plants and meat for food; automobile for transportation; industries for production of material goods for consumption; and electricity generation for lighting, among other. Thus consumptive value is primarily destructive.

Recreational value is also utilitarian, but it is nonconsumptive in the sense that it is on-site, experiential, and non-consumptive materially, i.e. non-destructive, although excessive use will impact the environment. Examples of recreational value invoked by participants were camping, fishing, hiking, boating, and kayaking, among others.

Medicinal value was coded when the research participants categorically said that forest and reefs contain plants and herbs with potential cures for many diseases.

Scientific/educational value was coded when respondents categorically said that these (nature, forests, animals) need to be saved to show to our children in future what a redwood tree looks like, or that much still remains to be learned scientifically and intellectually from forests and other environmental resources that we are losing.

Negative value is a special kind of value invoked by research participants. Negative value was coded when participants categorically said the picture is negative, or when they did not say anything positive but negative about the picture and expressed their dislike in all respects. For example on poultry: ugly, inhuman treatment of chicken, exploitation of workers by giving lower wage rates and make them work in a factory like fashion, workers exposed to chemical without due consideration to their health, benefits corporations alone exclusive of the contract grower, and environmental pollution, among others.

Religious value was coded when the participants used phrases like ‘God created’, ‘God’s gift’, ‘God gave us’, ‘these belong to God’, ‘we are given a responsibility to take care’, and ‘we should take care of God’s creation they should not be abused’, among others.

Three analytical methods were used to study the differences in environmental values in the sample. They are: a) ANOVA to test alternative hypotheses of difference in groups score means, b) LSD t-test for multiple comparisons to study individual differences in the score means between groups (Nazarea 1999; Nazarea, et al. 1998; Norusis 2000; SPSS 1997), and c) cross-table analysis to study the distribution of sample by value items and their association with variables of interest.

Socio-economic-political ramifications of environment use: Environment use in this complex and globalized world is not simple. It has all nature of ramifications: social, cultural, economic, and political. Therefore, to study the perception of this ramification of environment use in the sample ten themes from MTAT transcriptions to represent socio-cultural, economic, and political variables were selected (Table 3.4). Only those themes invoked by 25% or more of the participants were selected for statistical tests.

Cross-tabular analysis to study the distribution, ANOVA to test the alternative hypotheses of difference in the groups score means, and LSD t-test to complement the ANOVA results (Bhattacharyya and Johnson 1977; Nazarea 1999; Nazarea, et al. 1998; Norusis 2000; SPSS 1997) were run on the selected themes to study the ramifications of environment use in the sample as defined by levels of activism.

Table 3.4: Themes for socio-cultural, economic, and political ramifications of environment use

Sl	Theme description	Categories
1	Population growth/Overpopulation	Socio-cultural
2	Socio-cultural decay or degradation	Socio-cultural
3	Excessive use of resources	Socio-ecological
4	Sprawl, growth & development	Socio-ecological
5	Wasteful	Socio-ecological
6	Economics/greed over envt./community	Socio-ecological
7	Economic growth/Job creation	Socio-economic
8	Out of business and Job loss	Socio-economic
9	Socioeconomic inequity/exploitation	Socio-political /economic
10	Political, governance and policies	Socio-political

A description of the coding scheme for the selected social, cultural, economic, and political ramification themes is presented below.

Population growth/Overpopulation was coded when respondents categorically brought overpopulation issue in the discussion. *Socio-cultural degradation* was coded when respondents, for example, said people have become very individualistic, lost sense of community, sterile social environment, makes people turn inward, not family oriented, unfriendly, self gratification, and wealth display, among others. *Excessive use of resources* is used to refer to too much use of

resources, not necessarily indicating waste of resources. *Wasteful* was coded when respondents categorically stated waste of resource, irresponsible use, throwaway society, and wasteful habit among others. *Sprawl, growth, and development* code is used to refer to when respondents categorically spoke of sprawl, and outgrowing resources, and overdevelopment. *Economic growth and job creation* was coded when respondents specifically talked about economy, growth, and job creation. Similarly, *job loss and sending small businesses out of business* was coded when the respondents categorically mentioned it. *Socioeconomic inequity and exploitation* was coded when respondents talked about unfair wage rate, differential access to resource, child labor, smaller societies affected, stole water from Mexico, take away natural habitat from indigenous people, and we are taking more than our due share, among others. *Politics, governance, and policies* referred to anything that had to do with constitution, government, governance, legislation, enforcement, and government policies of various types. For example, it was coded when they said government isn't doing enough to protect environment, the policies are wrong, subsidizing timber industries, no political will, bad planning, and government is for corporations, among others.

3.5.5 Variations in levels of environmental concern

Data from MTAT and semi-structured interviews were used to study the variations in environmental concern. While coding the MTAT interview transcriptions for environmental orientation, both, positive and negative observations made by the research participants on environment were recorded. The negative observations are the environmental concerns expressed by the research participants. The environmental concerns thus scored and derived (also see photo-task transcription coding) for each research participants was analyzed to study the levels of environmental concerns in the sample. Based upon the sample mean (10.5), environmental

concern was classified into low (<10.5), moderate (10.5 to 14), and high (>14) categories. These concern categories were used to study distribution of research participants by level of activism, ethnicity, sex, age, and education. ANOVA was run to test the hypothesis of differences in groups score means (Bhattacharyya and Johnson 1977; Nazarea 1999; Nazarea, et al. 1998), and LSD t-test was run to complement ANOVA (Norusis 2000; SPSS 1997). Result of the ANOVA run on environmental concern was complemented by analysis of nine environmental degradation themes reported by participants in the MTAT session (Table 3.5).

Table 3.5: Environmental degradation themes coded for from the MTAT transcription

Sl	Themes	Category
1	Environmental degradation – complex	Environmental degradation
2	Environmental degradation – simple	Environmental degradation
3	Ecosystem threat & alteration	Environmental degradation
4	Physical degradation of landscape	Environmental degradation
5	Sprawl and growth	Environmental degradation
7	Loss of biodiversity	Environmental degradation
8	Loss of medicinal and plant species	Environmental degradation
9	Loss of wildlife and habitat	Environmental degradation

Environmental degradation – complex was coded when the participants explained process or talked about complex environmental problems. For example, runoff from paved surfaces and flooding, heat island/Hotlanta, weather/climate change, global warming, greenhouse gas, non-point pollution, heavy metal pollution, cows and methane gas, irrigation water becoming salty because of repeated use, and fertilizers kill the soil, among others. *Environmental degradation – simple* was coded when the participants made simple statements like air pollution, water pollution, destroy/impact environment, detriment to health, soil erosion, not good for nature, man has screwed things up and others. *Ecosystem threat & alteration* was coded when the research participants reported: landscape threatened/altered, invasive/non-native plant species, loss of old growth forest, destruction of reefs, dams interfering salmon spawning, flooding due to damming, changed hydrology, over manipulation of environment, loosing too

many wetlands, altered ecosystem, destruction of marsh, and ecosystem dying, among others. *Physical degradation of landscape* was coded when the research participants reported trashing/littering, clear cut, stripping the land, wilderness disappearing, asphaltting, decline/disappearance of greenspace, exposed earth or ground, natural setting destroyed, deforestation/forest eliminated, trees gone, ground tampered with, land is either cultivated or developed, and others. The theme *sprawl and growth* was coded when the research participants mentioned or talked about sprawl, outgrowing resources, do not develop natural areas, economic development, and overdeveloped, among others. *Loss of wildlife and habitat*, *loss of medicinal plant species*, and *loss of biodiversity* were coded when they specifically mentioned these themes.

3.5.6 Variations in the levels of environmental behaviors

Data from semi-structured interviews and MTAT were used to study and explain the differentials in the reported environmental behaviors as defined by levels of activism, ethnicity, sex, age, and education. Based upon the sample mean (4.51) for numbers of reported environmental behaviors and the minimum and maximum numbers of behaviors reported, the sample was classified into low (<4.51), moderate (4.51 to 7), and high (>7) levels of environmental behaviors categories for analytical purposes. ANOVA was used to study the difference in the groups score means to test the hypothesis and LSD t-test was run to complement the ANOVA results (Bhattacharyya and Johnson 1977; Nazarea 1999; Nazarea, et al. 1998; Norusis 2000; SPSS 1997). Pearson correlation analysis was performed to study the strength of association between environmental concerns and behaviors in the full sample ($N_{full} = 72$), and only layperson sample ($N_{lay}=41$). The Pearson correlation analysis results were complemented by cross-table using the environment concern categories and reported

environmental behavior categories. Although not within the scope of the research, an attempt is made to seek theoretical explanations for the current relationship between environmental concerns and environmental behaviors in the sample.

3.6 Assumptions and Limitations of the Study

Every research is beset with assumptions and limitations. The following are the limitations of this dissertation research.

- The study results represent the study area, and its direct extrapolation to larger population, for example to the Southeast or the United States, may not be appropriate.
- Given the multiple field sites, the spread out settlement pattern, privacy reasons, and more importantly the problem/difficulty in observing private sphere environmental behaviors of research participants, the study has primarily relied upon self-reported behavior.
- Although the ethnographic interview sample has been based on convenience sampling, attempt had been made to maintain sampling rigor as far as practicable to obtain sample units to represent the study population in terms of ethnicity, sex, age, and level of activism.
- Although the sample may come from a normal population, given the non-probability sampling procedure for the qualitative survey, the analysis and test results need to be interpreted in the light of this limitation. Given the quota nature of the sampling design, which mimics experimental design, the comparison of means and correlation/association between variables within the limits of the sample is appropriate.

CHAPTER 4: PERCEPTIONS OF THE ENVIRONMENT

4.1 Introduction

Although perception sounds simple, it is a complicated phenomenon and its usage is exceedingly varied (Gifford 1997; Mitchell 1984). Perception is used to refer to risk assessments, attitudes to environment, awareness and comprehension of hazards, cultural models and risk, visual perception of space, perception of time, spatial meaning, comprehension of environment, perceptual activity, and meaning of environmental terms, among others (Austin 2003; Beck 1969; French 1963; Gifford 1997; Kempton and Falk 2000; Mitchell 1984; Nazarea, et al. 1998; Sonnenfeld 1969; Van De Berg 2003). Perception is thus not only used to mean an immediate sensory experience to stimuli, but also to what one knows, including opinion. Strictly speaking, perception is the process of immediate sensory experience in an organism. As experience becomes less immediate, and the amount of inference by an organism increases, the process of cognition becomes involved (French 1963). In anthropology, most perception studies rarely detail perceptual activities, instead they concentrate on certain aspects of culture relevant to perception; often the relationship is closer to cognition than with perception (French 1963). It is in this latter sense that the term “environmental perception” is used in this dissertation. The goal of this chapter is to present the patterns and variations in the perceptions of environment as defined by the sociocultural factors in the study population (Boster 1987; Nazarea 1999; Pelto and Pelto 1975). The required data to study perception and test hypotheses in the study population are derived from card sorting, MTAT, and semi-structured ethnographic interviews.

The results of the test on the six hypotheses stated in Chapter 1 are presented in this chapter. Firstly, results of the cultural consensus analysis on the card sorting exercise to test the first hypothesis of what constitutes environment in the sample is presented. Secondly, results of analysis of the variations in the level of environmental orientation in the sample by a) level of activism, b) ethnicity, c) gender, e) age, and f) education are presented to test the remaining hypotheses. Environmental orientation is measured by the following environmental themes elicited during the MTAT session: a) ecosystem orientation, b) environmental state orientation, c) environmental protection orientation, d) environmental values, and e) socio-economic-political ramifications of environment use.

4.2 What Constitutes Environment? – A Cultural Consensus Analysis

Cultural consensus analysis is both a theory and a method. As a theory, it specifies the conditions under which more agreement among individuals on the right answers to questions or tests indicate more knowledge on their part. As a method, it provides a way to understand the underlying structure in answers to a set of questions in the face of certain kinds of intra-cultural variability (Borgatti 1996). The *cultural consensus theory*, as opposed to traditional test theory, provides a way to utilize much of the accumulated knowledge without knowing the *correct* answer in advance (Romney 1999; Romney, et al. 1987). A consensus among the participants on the question for a given domain (in my case environment) gives a culturally correct answer. This means One Culture assumption is correct, i.e. there are no subcultures that have systematically different views on a given topic or domain. Cultural consensus analysis uses factor analysis to compare research participants' responses to questions to study the degree of cultural consensus by examining the Eigenvalues for each factor extracted. The One Culture assumption is invalid if there are more than one large Eigenvalues. For instance, two large Eigenvalues is strong

evidence that two systematically different groups are in existence. However, the rule of thumb is that if the ratio of the first Eigenvalue to the second is less than 3 to 1, the assumption of one culture is indefensible (Borgatti 1996).

4.2.1 Results of cultural consensus analysis

The cultural consensus analysis extracted seven factors with Eigenvalues greater than one (see Appendix 4.1). The results of the cultural consensus analysis results are given in Table 4.1 below, which describes the seven factors in terms of factor construct or factor loading composition, Eigenvalues, and percentage of variance explained. The ratio ($34.88/10.57 = 3.3$) obtained from the Eigenvalues of the first two factors satisfies the 3:1 ratio of One Culture assumption. Thus the Hypothesis 1 of a lack of consensus in the study population as to what is meant by environment or constitutes environment is rejected.

Table 4.1: Factor values, eigenvalues, and total variance explained

Factors	Factor construct (composition)	Eigenvalues	% variance explained	Cumulative %
1	General (natural)	34.88	51.29	51.29
2	Built/modified (built+domesticates)	10.57	15.54	66.82
3	Built (built+Natural)	8.69	12.79	79.61
4	Natural (aquatic)	3.98	5.86	85.47
5	Natural (scapes)	3.36	4.94	90.41
6	Natural (domesticated plants)	1.59	2.33	92.74
7	Microorganisms	1.14	1.67	94.41

The extracted seven factors explained 94.41% of the total variance. However, the first factor explained only 51.29% of the total variance, and the first two factors explained only 66.82% (Table 4.1). Though the ratio satisfies the 3:1 ratio condition, there is more than one way of defining what is meant by environment. Therefore, the extracted seven factors were used to run Ward's method of hierarchical cluster analysis to study how the respondents clustered (Aldenderfer and Blashfield 1984; Richardson, et al. 1996). The result of the cluster analysis is presented in Appendix 4.2 and the corresponding data matrix (partial) of the respondents from

the card sort exercise is presented in Appendix 4.3. The individual cases/participants (identified by ID Label) in the card sort data matrix is exactly in the same order as they appear in the dendrogram. For example the case “10 - L/BM/>60yrs/4” is last in both the dendrogram and the data matrix.

Of the 76 cases used in the cluster analysis, the first cluster comprised 55 (72.4%) participants. Cluster-1 is the cultural consensus cluster. All the members of this cluster, but three (see Appendix 4.3), classified the 68 items used in the card sorting exercise environment. The average number of cards sorted as environment for the cluster is 67.9 (see Table 4.2).

Table 4.2: Cluster membership distribution and average number of cards sorted as environment

Clusters	Cluster description	Membership count	Percent	Average number of cards in the environment pile
Cluster-1	Consensus - Includes natural and built objects	55	72.4	67.9
Cluster-2	Only natural (excludes built objects)	7	9.2	57.4
Cluster-3	Only natural (excludes built objects and microorganisms)	8	10.5	58.9
No cluster	Outliers/Random	6	7.9	33.0
Total		76	100	63.0

Cluster 2 is comprised of 7 (9.2%) participants. Members of this cluster on average sorted 57.4 cards as environment; they did not include built objects in the environment pile (see yellow color coded items scored 0 in Appendix 4.3). The membership of this cluster is well distributed across ethnicity, sex, age group, education level, and among LAYP and NM/PF (see Appendix 4.2, 4.3, and 4.4).

Cluster 3 is comprised of 8 (10.5%) research participants. The cluster did not include built objects (yellow color coded items scored 0 in Appendix 4.3) as a part of environment during the card sort exercise. Clusters 2 and 3 excluded built objects from their definition of environment. However, the two are differentiated based on inclusion and non-inclusion of bacteria and virus in the environment pile: Cluster 2 classified bacteria and virus as part of

environment, while Cluster 3 did not (see pink color coded items scored 0 in Appendix 4.3). This differentiation between Cluster 2 and 3 is primarily due to factor seven, the underlying construct of which is virus and bacteria (see Appendix 4.1). The reasons given by the research participants for not including microorganisms in the environment pile are: they are not observable, they are human-made/manipulated, they cause infection and harm the environment, and that people do not associate environment with microorganisms when they talk about environment.

The last group made up of 6 research participants is the outlier. They have no pattern in defining what constitutes environment. This outlier group is primarily composed of laypersons, African American, male, older people (>60 years) with below undergraduate level of education (see Appendix 4.2 and Appendix 4.4).

Two interesting points emerge from the cultural consensus analysis: invoking religious belief and human as part of environment/nature. Firstly, six participants invoked God while talking about natural during the card sorting exercise. To these six participants the natural or nature is what is created by God and/or given by God. Secondly, of 76 participants, all, but eight (code zero in the human/people column in Appendix 4.3), identified humans as part of the environment. Following the card sorting exercise, I had asked participants “Is human a part of nature?” Fifty six respondents out of 64 replied human is a part of nature. Also, 46 respondents gave the reasons why humans are a part of nature. Of the 46, 21 invoked their religious belief. To them, since human is created by God like all other creatures and natural objects, human is a part of nature. Of the remaining, 24 gave biological and/or ecological reasons for humans a part of nature. This finding points religion an important factor in shaping worldviews and/or environmental beliefs of laypersons in particular.

4.3 Differences in the Levels of Environmental Orientation by Level of Activism

Difference in the levels of environmental orientation is studied as defined by the following themes coded in MTAT transcriptions: a) ecosystem orientation, b) environmental state orientation, c) environmental protection orientation, d) environmental value orientation, and e) socio-economic-political ramifications (see page 7 for definitions).

4.3.1 Perceived ecosystem orientation by level of activism

Table 4.3: Percentage distribution and score means for ecosystem orientation

Particulars	Level of activism			
	ACTV	NM/PF	LAYP	Total
Score means	9.25	4.53	2.98	4.43
% of participants invoking ecosystem concept at least once during MTAT session	100.0	100.0	75.6	86.1
Sample size (Ni)	12	19	41	72

Perusal of Table 4.3 reveals that a large proportion of the participants (86.1%) invoked the concept of ecosystem at least once during the MTAT session. Noteworthy, 75.6% of laypersons also invoked ecosystem concept. However, ANOVA result indicates that the difference in the score means for the groups is statistically significant ($F=18.34$, $p<0.000$) at the levels tested (Appendix 4.5), indicating that ACTV has higher level of ecosystem orientation than NM/PF and LAYP (see LSD t-test result). Thus a part of the alternative hypothesis H_{A2} that ecosystem orientation in the sample differs by level of activism is accepted.

The difference in ecosystem orientation is due to the difference in association of ecosystem concept with the environmental forms as represented in the pictures (see Table 4.4). A perusal of the table reveals that LAYP category has the lowest average percentage of respondents (17.5%) invoking the concept of ecosystem per environmental scene. Overall, the sample tend to associate ecosystem with natural environment (for e.g., wetland, logging, wildlife, forest, river dam, arid area) with the exception of strip mall and manicured lawn which may be primarily attributed to ACTV and NM/PF participants (Table 4.4). LAYP primarily associate ecosystem

Table 4.4: Distributions of ecosystem orientation by level of activism

(in percentage by environmental scenes)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Factory	16.7	15.8	2.4	8.3
2	Highway & traffic	33.3	5.3	2.4	8.3
3	Landfill	25.0		9.8	9.7
4	Agriculture	33.3	21.1		11.1
5	Cattle pasture	58.3	5.3	4.9	13.9
6	City	75.0	10.5	2.4	16.7
7	Stream	50.0	15.8	12.2	19.4
8	Sub-division	33.3	15.8	17.1	19.4
9	Chicken houses	58.3	21.1	12.2	22.2
10	Arid area	58.3	42.1	12.2	27.8
11	Manicured lawn	58.3	36.8	17.1	29.2
12	Strip mall	41.7	42.1	22.0	30.6
13	Dam	75.0	42.1	17.1	33.3
14	Logging (sawing a tree)	83.3	26.3	39.0	43.1
15	Wildlife	75.0	42.1	41.5	47.2
16	Wetland	83.3	63.2	36.6	51.4
17	Forest	66.7	47.4	48.8	51.4
	Average	54.4	26.6	17.5	26.1
	Sample size (Ni)	12	19	41	72

with natural environments, while NM/PF and ACTV associate ecosystem to a wider range or forms of environment, both natural and modified/built. ACTV in particular invoke the concept of ecosystemic relationship pretty consistently across all forms of environment. This difference in the participants' perceived ecosystem orientation is primarily a function of ecological knowledge held by participants, which is evident in LAYP's concept/knowledge of ecosystem discussed below (see the types of ecosystem themes invoked and the quotes). Also, perhaps, this is a ramification of the way many LAYP and NM/PF define environment, i.e. natural environment is environment (see cultural consensus analysis).

ACTV and NM/PF ecosystem orientations, mainly drawing on science brought up ecosystem topics or themes like balance of nature, sustainability, adaptation, runoff, ground cover to hold soil, ammonia and nitrogen from chicken litters, evolution, fragmented habitats, global warming/climate change, heat island/micro-climate, biodiversity, salmon spawn interference by river dams, ocean pollution and reef destruction, ground water depletion and

recharge, stream bank erosion and buffer, wetland replenishing ground water and acting as filter, deer overpopulation, and contamination of groundwater, among others.

Many LAYP were familiar with the terms *ecosystem* and *ecology*. They invoked ecosystem themes like plants produce oxygen, runoff from paved surfaces cause water pollution and flooding, balance of nature, paved surfaces and microclimate/heat island, plants hold soil, food chain/chain reaction, everything has a purpose or role, ground water pollution, wildlife habitat loss and wildlife extinction, forest and wetland as wildlife habitat, and deer overpopulation. However, they did not bring up themes like ammonia, nitrogen and phosphorus from chicken litters pollute water, evolution, fragmented wildlife habitats, watershed, global warming/climate change, biodiversity, water cycle, salmon spawn interference by dam, ocean pollution and reef destruction, ground water depletion and recharge, stream bank erosion and buffer, and wetland replenishing ground water and acting as filter brought up by ACTV and NM/PF. This indicates the differential in ecosystem orientation a function of knowledge.

LAYP primarily acquired environmental information from TV news and newspaper followed by friends and families, which limited or determined their extent of scientific basis for their ecosystemic knowledge (see Appendix 4.6). LAYP ecosystem orientations though informed by science, the knowledge depth varied to quite an extent. Besides science, their ecosystem orientation is informed by lifetime experiences, common sense knowledge and religion, as well. Since layperson everyday environmentalism is of particular interest, presented below is a sample of selections which shows variations and the bases of ecosystem concepts.

Firstly, a sample of four participants who combined science with commonsense and lifetime experience is presented. The first is a comment on wetland from a high school graduate lay black male who works for United Parcel Service of America Inc. (UPS) as a delivery driver.

His environmental information source is newspaper. He combines the ‘food chain’ and ‘everything has a purpose or role’ arguments for his perceived ecosystem orientation, which is informed by a little bit of science, commonsense and his lifetime experiences.

Each one plays a significant role in the cycle of life I guess you’d say. They play an important part in the food chain. Animal feeds off another animal or feeds off insects and help control insect and that kind of stuff. In the whole scheme of nature, each has a significant role I think so they are needful. Even though some of them we don’t like, I hate snakes, but I know they serve a purpose. They have a purpose here and it wouldn’t be good to kill them.

Participant - L/BM/<40yrs/2

Second sample is a comment from a college graduate 70-years old black woman who uses the concept of ‘ecosystem’ and ‘balance of nature’ argument to justify the importance of wetland. She is a retired teacher, a small business owner and a community activist. Her primary source of environmental information is newspaper and magazines.

This is a swamp here, I guess. I’m not a biology person, but I am aware that there are certain things called ecosystems that you have to let one thing feed on another thing, and whatever. It is necessary to have areas like this unpolluted where you don’t have boats and things running through all the time...So you do need some areas like this to preserve the balance of nature.

Participant - L/BF/>60yrs/2

The third selection is a quote from a middle-aged college graduate white woman. She is aware of the term ecology, and realizes the ecological importance of wetland, but not sure how. Realizing the importance of wetland, she thinks people should respect nature or environmental resources. Her sources of environmental information are newspaper, TV, and friends.

Is this the everglades or what is it? I think it should be preserved, I don’t think anything should be built in it. I think it should be preserved in the same sense the way I think a mountain should be preserved. And not go out and level a mountain. Mine it for granite, strip mine or whatever and then just level it. Unless there is some need, I can’t imagine the need to do that. And I’m sure that ecologically these places play a role, but I don’t know. I’m not smart enough to do that. I just believe that streams, mountains, rivers, and lakes things like that have developed for a reason. I may not understand it, but I need to respect it.

Participant - L/WF/40-60yrs/3

The fourth sample is a young black female with a master's in mass communication. The quote is from the comment she made on the manicured lawn scene. She thinks our actions should commensurate with the flow of nature. Any deviation is improper, or unnatural.

I think human beings are very dangerous. We want fertilizer to keep our grass green...I see a real danger in it...we are constantly striving to develop something that is going to nurture what we want. So when I think of fertilizer I think about somebody wanting evergreen grass all year long. It wasn't designed that way. Naturally, the process is not that way. Like a natural body does not stay the way it was when you were 17, but that's what we want. So we develop a way to maintain what we want to have; that does not make sense because that's not the way it was designed. You should flow with nature; you shouldn't flow against the way it was designed. If the body stops being able to hold a child or have children at the age of 40 why are you trying to have a child at age 55. That's not the process, so why are you doing it. It wasn't designed that way.

Participant - L/BF/<40yrs/3

While the above participants used their ecological, ecosystem and common sense knowledge, and personal lifetime experiences, the quotes below exemplify how laypersons invoke God or religious belief to explain ecosystem relationships. Besides invoking God directly, many laypersons remarked that everything has a purpose in life, which is drawn from the Christian teaching of everything is created by God for a purpose. Given below are two quotes from research participants who invoked God to explain ecosystemic relationships. The first quote is from a 43-year old, high school educated black female working for a funeral home. It demonstrates how ecosystem orientation is linked to religion, her lifetime experience and observation, and 'food chain' and 'everything in life plays a role' arguments:

God put us here, he also put the animals here for a reason, and a lot of them are for food purposes. People eat deer, people eat rabbits. Everything in life plays a role...I was saying everybody plays a part, there is like a chain reaction thing. You know there are other animals out there that prey on...

Participant - L/BF/40-60yrs/5

The second quote is from a young black male, a recent college graduate in math education. This quote is taken from the comment he made on the forest scene from the MTAT

session. He uses the God, dominion, food chain, and the eventual impact on human arguments to explain the ecosystemic relationship perception which he holds.

God created the animals and just because He gave us dominion doesn't mean that you have to take the animals out completely. They need to be able to live somewhere because I think eventually that food chain somehow comes back and affects us as humans. Even beginning from the little tadpole or a little frog, somewhere eventually it will come back to us.

Participant - L/BM/<40yrs/4

Although the ecosystem knowledge of laypersons is simple and shallow as compared to environmentalists or professionals, some lay laypersons possess good ecosystem knowledge. The four selections below demonstrate science-based ecosystem orientations of laypersons.

The first is a quote from an 80-year old black male with only a high school education, who primarily worked as a carpenter until 1965 and then went on to work for a jeweler for 34 years until his retirement. He acquires his environmental information from TV news, newspapers, and magazines like National Geographic and Readers' Digest.

That's a marshland right? Those we need for the ecology because that's where a lot of our animal, especially, the fishes and so forth grow up before they go to the rivers and the ocean and so forth. So we need that; that helps out the whole environment. I think it is good because it is part of the ecosystem. And that's where the fishes and other things spawn and go up before they go to the ocean. So I think that's a good thing.

Participant - L/BM/>60yrs/5

The second selection is a layperson holding good ecosystem relationship knowledge. The participant is an older black male with a master's in public administration. To him nature without human interference is always in balance. He brought up the Grand Canyon and wolves topic while making comments on the forest scene.

They serve a significant role and I think that what we need to do is to make certain that the Grand Canyon and its certain aspects should always be there. The wolves should go back into the Grand Canyon because they serve a significant role...what I'm talking about is we need to make certain that there are decisions regardless of what farmers say about the wolves. We need the wolves. They serve a function that was adequately complete because of Mother Nature that did not require input from the sheep farmers. And the balance was

appropriate and maintained and sustained until the encroachment of humans into some of those areas which were preserved, pristine, and in their natural state.

Participant - L/BM/>60yrs/7

The third selection is a middle-aged high school educated white female. Her sources of information are TV, newspaper, and personal observations. The quote is from a comment she made on the green manicured lawn.

This lawn is really pretty, it's really sweet, it looks like a lot of work and it's definitely not very good for the planet. It has to be watered a lot more often and it doesn't make a natural habitat for a lot of creatures. The shorter you grow it the more water it needs, for it dries out. But it also gets rid of so much of the chain of life cycle because so many creatures no longer have a place to live and hide and feed bigger creatures. We're just killing off more species.

Participant - L/WF/40-60yrs/2

The final selection is a high school graduate older white male. He worked for Air Force, Bell South and owned a business. He is retired now. His sources of environmental information are TV and newspaper. The quote is from the comment he made on the strip mall scene picture.

They have tried to put in some trees, and ground cover. I know out at Wal-Mart they don't have much trees and stuff. All of that is good for business, but it can have an adverse affect on environment because you have all the cars out there, leaking oil, and anti freeze. It can run off, run into land and water. Pollute things. They need to have more vegetation.

Participant - L/WM/>60yrs/4

4.3.2 Perceived environmental state orientation/awareness by level of activism

Table 4.5: Percentage distribution and score means for environmental state orientation

Particulars	Level of activism			
	ACTV	NM/PF	LAYP	Total
Score means	16.00	14.53	9.83	12.10
% of participants invoking environmental state orientation at least once during MTAT session	100.0	100.0	100.0	100.0
Sample size (Ni)	12	19	41	72

Although all research participants are aware of environmental state in some form, their levels of awareness differ by level of activism as indicated by the score means (Table 4.5).

ANOVA shows that the difference in the groups' score means is statistically significant ($F=33.27$, $p=0.000$), thus alternative hypothesis H_{A2} that the differences in the environmental

state orientation is a function of level of activism is accepted (see Appendix 4.5). LSD t-test indicates that the score means between ACTV and NM/PF do not differ significantly, while their score means differ significantly from LAYP score mean. Based on the score means and the test results, it is concluded that ACTV and NM/PF more frequently think and talk about environmental state/quality than laypersons.

I now present how the participants associate environmental state orientation with environmental forms. Table 4.6 reveals that, as compared to ACTV and NM/PF, LAYP less frequently associate environmental state or quality with cattle pasture, arid area, chicken houses, manicured lawn, and river dam. This lower level of environmental orientation suggests that either LAYP has lower level of environmental knowledge or lack of development of environmental quality opinions on environmental forms depicted in these photographs, which again is a function of knowledge. These environmental forms do not provide visual cues in terms of environmental quality or ecological functions/services, which can be primarily discerned with

Table 4.6: Distribution of environmental state orientation by level of activism
(in percentage by environmental forms)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Cattle pasture	83.3	52.6	19.5	38.9
2	Arid area	100.0	52.6	24.4	44.4
3	Chicken houses	91.7	68.4	29.3	50.0
4	Manicured lawn	100.0	89.5	34.1	59.7
5	Dam	83.3	100.0	39.0	62.5
6	Stream	83.3	68.4	43.9	56.9
7	Agriculture	100.0	73.7	46.3	62.5
8	Wetland	100.0	94.7	48.8	69.4
9	Sub-division	100.0	94.7	53.7	72.2
10	Strip mall	100.0	100.0	61.0	77.8
11	Forest	91.7	84.2	63.4	73.6
12	Wildlife	91.7	89.5	65.9	76.4
13	City	83.3	100.0	80.5	86.1
14	Logging (sawing a tree)	100.0	94.7	87.8	91.7
15	Highway	100.0	94.7	92.7	94.4
16	Landfill	91.7	94.7	95.1	94.4
17	Factory	100.0	100.0	97.6	98.6
Average		94.1	85.4	57.8	71.2
Sample size (Ni)		12	19	41	72

knowledge derived from ecological science—not usually from personal lifetime experiences or observations. Given the inability of laypersons to discern environmental problems from environmentally benign looking scenes, and statistically significant higher score means for ACTV and NM/PF, it is inferred that environmental state orientation is a function of knowledge, which explain the differences in environmental state orientation by level of activism.

4.3.3 Perceived environmental protection orientation/attitude by level of activism

Table 4.7: Percentage distribution and score means for environmental protection orientation

Particulars	Level of activism			
	ACTV	NM/PF	LAYP	Total
Score means	12.50	10.32	5.41	7.89
% of participants invoking environmental protection orientation at least once during MTAT session	100.0	100.0	90.2	94.4
Sample size (Ni)	12	19	41	72

Table 4.7 shows a high percentage (94.4%) of the research participants, inclusive of LAYP, expressed the need to protect the environment at least once during the MTAT session. However, ACTV volunteered the need to protect environment most number of times than NM/PF and LAYP, which differed significantly ($F=27.23$, $p=0.000$) from the other groups score means (see Appendix 4.5). This is indicative of significantly higher level of environmental protection attitudes in ACTV followed by NM/PF and LAYP (see Appendix 4.5 for LSD t-test). Thus a part of hypothesis H_{A2} difference in environmental protection orientation is a function of level of activism is accepted.

A perusal of Table 4.8 shows that laypersons, as opposed to ACTV and NM/PF, very weakly associate the perceived need of environmental protection with chicken houses, cattle pasture, arid area, agriculture, river dam, manicured lawn, city, stream, highway, and wetland. If we compare the order of percentage values for environmental protection orientation theme for LAYP in Table 4.8 to order of percentage values of environmental state orientation theme in

Table 4.8: Distribution of environmental protection orientation by level of activism
(in percentage by environmental forms)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Chicken houses	50.0	21.1	7.3	18.1
2	Cattle pasture	66.7	47.4	9.8	29.2
3	Arid area	75.0	42.1	12.2	30.6
4	Agriculture	83.3	47.4	17.1	36.1
5	Dam	66.7	57.9	17.1	36.1
6	Manicured lawn	75.0	57.9	17.1	37.5
7	City	50.0	52.6	22.0	34.7
8	Stream	50.0	36.8	26.8	33.3
9	Highway	83.3	52.6	29.3	44.4
10	Wetland	75.0	63.2	29.3	45.8
11	Forest	66.7	68.4	31.7	47.2
12	Strip mall	66.7	63.2	36.6	48.6
13	Sub-division	75.0	78.9	39.0	55.6
14	Factory	75.0	68.4	46.3	56.9
15	Landfill	100.0	94.7	63.4	77.8
16	Logging (sawing a tree)	91.7	89.5	68.3	77.8
17	Wildlife	100.0	89.5	68.3	79.2
	Average	73.5	60.7	31.9	46.4
	Sample size (Ni)	12	19	41	72

Table 4.6 for LAYP, there is a similarity in pattern. This similarity in pattern is indicative that environmental protection orientation is a function of environmental state orientation. Thus it is concluded that the inability of LAYP to discern environmental problems (state) in certain benign looking environmental forms explain their lower level of environmental protection orientation.

4.3.4 Ethical orientations

Utilitarian-consevationism: The moral guideline for environmental protection orientation discussed in the previous subsection may be termed utilitarianism-conservationism or ecological-anthropocentrism. The research participants advocated preservation of some natural environment, for example, old growth forests and wetlands, for ecological function, national heritage, or educational purposes, while conserving or wise use of the others. The concept signifies a combination of preservationism and conservationism. Besides the utilitarian-conservationism ethics, the participants invoked religious, stewardship, communalism, and

humane treatment of animals as bases or guidelines for treatment of environment or environmental protection. They are discussed in the following subsections. The percentage distribution of ethical orientations and its score means is presented in Table 4.9, and ANOVA and LSD t-test results are presented in Appendix 4.7, which I will refer to while discussing the other ethical bases.

Table 4.9: Percentage distribution and score mean for ethical code by level of activism

SI	Themes	Percentage of participants				Mean			
		ACTV	NM/PF	LAYP	Total	ACTV	NM/PF	LAYP	Total
1	Religious (ethics)	8.3	15.8	34.1	25.0	0.08	0.32	0.54	0.4
2	Stewardship (ethics)	16.7	10.5	17.1	15.3	0.25	0.21	0.24	0.24
3	Communalism (ethics)	41.7	26.3	19.5	26.4	0.42	0.26	0.2	0.25
4	Humane treatment (animal)	66.7	47.4	43.9	48.6	0.67	0.53	0.49	0.53
Sample size (Ni)		12	19	41	72				

Religious basis: Twenty five percent of the participant invoked religion while talking about environmental protection. A large proportion of this segment of the sample is comprised of LAYP, followed by NM/PF, and ACTV (Table 4.9). However, the groups score means did not differ significantly ($F=1.36$, $p=0.263$) at the significance levels tested (see Appendix 4.7).

The emergence of religious basis as a theme for protecting environment in the MTAT session is interesting, particularly in the light of Lynn White's (1967) thesis *Christianity the root cause of ecological crisis*. Based on Genesis 1:28, Lynn White in his classic polemic *The historical roots of our ecologic crisis* calls Christianity the most anthropocentric religion the world has seen: the axiom is "...that nature has no reason for existence save to serve man." The following quote explicates the historical roots of ecological crisis thesis.

The victory of Christianity over paganism was the greatest psychic revolution in the history of our culture...By destroying Pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects...Our daily habits of action are dominated by an implicit faith in perpetual progress, which was unknown either to Greco-Roman antiquity or to the Orient. It is rooted in, and is indefensible apart from, Judeo-Christian teleology...Our science and technology have grown out of Christian attitudes toward man's relation to nature...Both our present science and our present

technology are...tinctured with orthodox Christian arrogance toward nature...(White 1967).

Contrary to the quote above, the following is a quote from a black male respondent. He has a bachelor's in agriculture, and worked for the United States Department of Agriculture. This person's worldview, inclusive of afterlife, and ethics are fully informed by his religious belief.

These are our environment. This is Mother Nature. They were put here for a purpose...God made these creatures, but he also made man to be custodians of these creatures here, so we have to take care of them. These are God's gifts; they're here for a purpose and man needs to make sure that they are also taken care of. They have a right to be here. They have a right to live; they have a right to have a safe place to stay; they have a right to food and shelter and water as we do and man has to step forward and make sure their needs are preserved. And when we do that, God will bless us...He's going to hold us accountable as good stewards to take care of the things he left us in charge of. I believe that there's a life for us after we leave here.

Participant - P/BM/>60yrs/6

The primary argument put forward by research participants are that the earth and things on earth is 'God's creation', 'God's gifts to us', or 'God gave us the responsibility to take care of it'; therefore they should not be abused, but protected and used wisely. Some participants believe that the doctrine of scientific conservation of resources goes in hand with the Christian belief of wise use for its continued use in the future. Participants primarily invoked their religious basis while dealing with natural environment, primarily the wildlife followed by the logging scene (see Appendix 4.8). The primary reason for this association is that many laypersons are aware of wildlife and its habitat loss. Over all, 79.2% of the sample and 70.7% of LAYP participants brought up the issue of wildlife and its habitat loss (also see Chapter 5). Similarly, 79.2% of the sample and 68.3% of LAYP expressed the need to protect environment while commenting on wildlife scene (see Table 4.8, p. 81). The other interesting observation is invoking religious basis for environmental protection while dealing with the very old large-tree-sawing scene. Over all, 77.8% of the sample and 68.3% of LAYP brought up the need to protect environment while dealing with the logging scene during the MTAT (see Table 4.8, p. 81). Besides religion, it is

also the effect of the majestic characteristic of the old large tree; many participants expressed their sadness over felling of such a large old tree.

Stewardship: Stewardship was coded when the participants categorically used the words custodian or steward, expressed the responsibility to take care of environment, or God endowed us with responsibility to take care of environment. Since the percentage of participants invoking stewardship ethics was less than 25%, no statistical test was run. The percentage distribution of participants invoking the stewardship ethics and its score means by level of activism are almost identical, indicative of lack of difference between groups (see Table 4.9).

The stewardship ethic, like environmental protection orientation/attitude, is associated with natural environment, primarily wildlife (see Appendix 4.9). Of the 17 frequency count, religious basis accounted for 12, ecological for four, and majestic nature of mega fauna for one. Interesting is the stronger religious basis of stewardship in the LAYP sample, contrary to the dominant thesis of dominion over nature and ecological crisis. In addition to the earlier quote of Participant - P/BM/>60yrs/6, which I used to contrast with Lyn White's thesis, the following two quotes exemplify religious basis of stewardship. The first quote is from a young lay white male on wildlife. He says man was put in charge to take care of the animals God created. The second is from an older black male on forest. He thinks humans as steward are not doing enough.

Question: What's bad about losing those animals and their habitat?

Answer: Well, that comes back down to theology. God, when He created the animals, He put man in charge of the animals. All the sea animals everything, He said you were put here to take care of things. It's not very caring to cut down their homes.

Participant - L/WM/<40yrs/5

If you say God created earth, He created all human beings, I mean all life, and that He put man at the top of the chart, then what's going on? Well what's going on is that man that was created by God lost sight of stewardship. And stewardship simply says that there is a proper way to take care of that domain. My position is that man created by God had not done the best job of managing in a steward like way that domain over which he resides...They did a job, but they didn't do enough of it.

Participant - L/BM/>60yrs/7

Communalism: Communalism was coded when participants reported animals and plants have equal right as humans to be on this earth. ANOVA ($F=1.22$, $p=0.302$) and LSD t-test results were insignificant indicating that the group score means do not differ significantly (see Appendix 4.7). Communalism, like other ethics, is largely associated with wildlife (see Appendix 4.10), indicative that humans extend communalism ethics primarily to animals.

Since communalism is largely informed by biocentric, transcendentalism, and deep ecology philosophies, a higher percentage of ACTV (41.7%) and NM/PF (26.3%) invoked communalism (Table 4.9). A few ACTV invoked Native American and Deep Ecology philosophy. Following is a quote from an activist environmentalist on wildlife:

It horrifies me when I read in the paper. If somebody went out in the woods and got attacked by bear, we go and kill the bear, as if it's the bear's fault. It's the human's fault. We have no right to kill a bear. These are our fellow creatures and we need to respect them. Deep ecology indicates that it's not devoid of killing, you could still hunt. If you're hungry, that is fair. You can kill it...But you'd do what the Native Americans did, you explain to it. 'I'm sorry, I had to kill you, but I was hungry. Rest assured when I die, I will rot and I will nurture some plants that your offspring can eat.' You don't kill to hang the head on wall.

Participant - A/Env/WM/2

Although LAYP are not well informed by deep ecology and biocentric ethics, they have a sense of communalism. Their expressions included, for example, the animals are like humans, the deer are my neighbor, they have a right to be here as humans, they [animals] were here before us, which they largely drew from the book of Genesis for animals and plants were created before man. The following quotes exemplify LAYP sense of communalism. The first quote is from a young white male on wildlife; he thinks animals are like babies. The second quote is from a young black male on logging. He says trees got rights, perhaps an expression to show his concern for extensive removal of trees. The third is from a middle-aged black male on wildlife; for him the deer are his neighbor.

It's like saying what you think about babies? None of them should die; of course I totally like these animals. Yeah I like them, of course I do. And I am sure that something somebody is doing is affecting their lives, affecting their environment around them.

Participant - L/WM/<40yrs/5

Look what they done to them. How do you think that tree feels? That tree got rights. But men have cut it down to put his crops. Trees have to go for houses. Trees got to go for road. Trees got to go...So how long do you think we're going to survive?

Participant - L/BM/<40yrs/3

...the deer come and eat it and we can sit in our kitchen window and we can look out and we can see the deer. I consider myself to be friendly to my neighbors, they are my neighbors. So I let the brush grow wild and they come and eat and I hope it makes them feel more at home and at ease. I cut the grass, but the brush I just let it grow.

Participant - L/BM/40-60yrs/5

Humane treatment of animals: Inhumane treatment of animals, especially chicken, is of equal concern to the three groups. ANOVA ($F=0.43$, $p=0.650$) and LSD t-test did not show significant difference in their groups score means (see Appendix 4.7). Humane treatment of animals was primarily brought up by the research participants when they dealt with the mass poultry production scene. They were particularly critical of the crowded living conditions, hormonal and antibacterial treatment for fast growth, their transportation, and chickens bred primarily for large breasts which make them difficult to move, among others. Some even thought that fencing in cattle was cruelty to animals. Given the pet loving nature of Americans, the high levels of displeasure towards inhumane treatment of animals is natural.

4.3.5 Differences in environmental value orientation by levels of activism

General distribution pattern of environmental values: The percentage distribution of research participants by the types of values invoked and the percentage distribution of values invoked by participants are presented in Table 4.10 and Table 4.11, respectively. Perusal of the tables reveals that consumptive, beauty, and ecological are the three most invoked values by the research

Table 4.10: Percentage distribution of participants by values and level of activism

Sl	Themes	ACTV	NM/PF	LAYP	Total
1	Consumptive	100.0	100.0	100.0	100.0
2	Beauty - pleasing to the eyes	100.0	100.0	100.0	100.0
3	Ecological (ecol. service & function)	100.0	100.0	70.7	83.3
3	Psycho-spiritual	75.0	57.9	61.0	62.5
4	Ugly	83.3	52.6	53.7	58.3
5	Recreational	75.0	73.7	43.9	56.9
7	Negative	100.0	78.9	26.8	52.8
8	Intrinsic	66.7	63.2	36.6	48.6
9	Religious	8.3	15.8	41.5	29.2
10	Heritage	25.0	10.5	17.1	16.7
11	Medicinal	33.3	10.5	2.4	9.7
12	Educational & scientific	25.0	10.5		6.9
Sample size (Ni)		12	19	41	72

Note: Percentage in each cell is based on corresponding sample size

Table 4.11: Percentage distribution of environmental values by level of activism

Sl	Values	ACTV	LAYP	LAYP	Total
1	Consumptive	35.5	42.8	48.3	44.2
2	Beauty - pleasing to the eyes	10.8	15.4	21.7	17.8
3	Ecological (ecol. service & function)	19.9	13.4	10.7	13.3
4	Negative	14.4	7.8	2.1	6.1
5	Ugly	4.4	5.8	4.3	4.8
6	Recreational	4.4	5.4	2.5	3.7
7	Psychospiritual	3.6	3.2	3.9	3.7
8	Intrinsic	3.3	3.2	1.8	2.5
9	Religious	0.3	1.4	3.5	2.3
10	Heritage	1.4	0.6	0.8	0.9
11	Medicinal	1.1	0.4	0.2	0.4
12	Educational & scientific	0.8	0.6	0.0	0.3
Column total		100.0	100.0	100.0	100.0
Total count		361	500	944	1805

Note: Percentage distribution in each column is based on corresponding total count, which is the total frequency of values invoked/volunteered by participants during MTAT session.

participants in terms of most number of participants invoking a value (Table 4.10) and most number of times a value is volunteered (Table 4.11).

Although the number of times value invoked is low for psychospiritual, recreational, ugly, negative, and intrinsic (Table 4.11), the percentage of participants invoking these values are high, which is near 50% or more (Table 4.10). Of the remaining, religious value is most invoked by LAYP than ACTV and NM/PF, indicative of religion an important basis for laypersons. However, although there is a little variation in percentage distribution of values in the sample, their distribution pattern for individual group/category is similar across the groups

(Table 4.11). This is indicative of the fact that the value structure in the sample is similar across the groups. However, their level or intensity vary, which I present in the next subsection.

Thus, overall, it is concluded that the value structure in the sample as defined by level of activism is similar, in which, besides consumptive, aesthetics (beauty, psychospiritual, recreational, and ugly) and ecological are the two most important values in the study population.

Differences in environmental value - ANOVA, LSD t-test, and value association: The

distributions discussed above presents a general patterning of the values in the sample. I now present the differences in environmental values in the study population as defined by level of activism. This is achieved by comparing the group score means by running ANOVA and LSD t-test, and value association with the environmental forms/type by level of activism (see Appendix 4.11 and Appendix 4.12 for results).

Consumptive value: As expected consumptive is the most invoked and well distributed value across the environmental forms in the study population (Appendix 4.12). Also, the group score means differences in the study population are statistically insignificant at the levels tested, as indicated by both the ANOVA ($F=0.31$, $p = 0.736$) and LSD t-test (see Appendix 4.11). This insignificance supports the null hypothesis; thus the alternate hypothesis in terms of consumptive value as a function of level of activism is rejected.

Aesthetic values: Of the four aesthetics related values—beauty, psychospiritual, ugly and recreational—the difference in the score means for beauty ($F=3.79$, $p=0.027$) and recreational ($F=5.37$, $p= 0.007$) values are statistically significant at the levels tested (see Appendix 4.11). LSD t-test shows that the difference in the score means for these two values between ACTV and NM/PF is statistically insignificant, though their score means differed significantly from LAYP score mean (see Appendix 4.11).

Interestingly, LAYP has a higher score mean for the value beauty than ACTV and NM/PF, indicative LAYP has a greater appreciation for beauty. However, interesting is the beauty value association in the sample by environmental forms/scenes and level of activism. Perusal of Appendix 4.13 reveals that the reason for the difference is primarily due to the fact that most LAYP see beauty in manicured lawn, while most ACTV and NM/PF do not. Additionally, many LAYP associated beauty with dam, city, cattle pasture, and river dam, which looks beautiful. In contrast, most ACTV do not associate beauty with these scenes, but environmental degradation, which I will later explore in Chapter 5.

Contrary to beauty, ACTV and NM/PF has a statistically significant higher score means than LAYP for recreational value, while the score means between the two do not differ significantly (see Appendix 4.11). Recreational value in the sample is primarily associated with natural environment like arid area, river dam, forest, stream, and wetland (Appendix 4.12). Historically, recreational use of natural environment for its preservation has been a key aspect of the modern environmentalism which began with middleclass transcendentalism and preservationism in the mid-nineteenth century, and policies of federal government (Petulla 1988; Rothman 1998; Steinberg 2002). Thus it is imperative that ACTV and NM/PF are likely to have higher levels of recreational value orientation than laypersons.

Given the statistical test results it is concluded that while beauty and recreational value is explainable in terms of level of activism, ugly and psychospiritual values are statistically invariant in the population as defined by level of activism.

Ecological value: Overall, 83.3% of the research participants volunteered ecological value at least once during the MTAT session (Table 4.10). It is the third most invoked value by the research participants. Although a large proportion of the sample, inclusive of LAYP (70.7%),

volunteered ecological value (Table 4.10), their levels of orientation differed significantly between the groups as defined by their score means ($F= 11.38$, $p=0.000$) (see Appendix 4.11). LSD t-test also revealed significantly different score means between the three groups. Based on test results, alternative hypothesis H_{A2} of difference is accepted, and concluded that ACTV and NM/PF have higher levels of ecological value orientations than laypersons.

Appendix 4.14 presents association of ecological value by environmental forms and level of activism. In general, the participants associated ecological value with natural environment. LAYP in particular tend to associate more with natural environment bodies like forest, wetland, wildlife, and logging (forest), while ACTV and NM/PF associated with a wider range of environment forms, both natural and modified/built. This is primarily due to emphasis of LAYP on production of ecological services and functions, while ACTV and NM/PF emphasized both the production and disruption of ecological services and functions. This observed difference is a function of ecosystem knowledge held by participants.

Negative value: Interesting is the emergence of negative value. Although a few LAYP samples talked about negative value, it is primarily carried by ACTV and NM/PF in terms of number of participants invoking it (Table 4.10) and the number of times invoked by the participants (Table 4.11). ANOVA ($F= 30.7$, $p=0.000$) and LSD t-test indicate that the groups score means differed significantly between all the groups (see Appendix 4.11). Thus a part of the alternative hypothesis H_{A2} that difference in negative value carried by the research participants as defined by level of activism is accepted.

Distribution of the negative value by environmental forms and level of activism is presented in Appendix 4.15. Primarily, ACTV followed by NM/PF associate negative value with manicured lawn, strip mall, highway/traffic congestion, landfill and subdivision. The negative

value formation is primarily due to their perception of environmental damage they create, and the negative socio-cultural, economic, and political ramification associated with these forms of environment use. They primarily see the *laissez faire* capitalistic economic system and the associated businesses and corporations as the evil, whose only motive is to make economic profit at the expense of environment and humanity. However, the concept of negative value for LAYP is simple, which is directly related to their taste, aesthetics, and environment.

Presented below are five selections from ACTV and LAYP to demonstrate the variation in negative values carried by them. The first two quotes are from ACTV. The first comment is on the poultry production facility and the second is on the manicured lawn.

It looks like industrial poultry facility. It pretty much grosses me out. I think combined operations are pretty disgusting. They are inhumane and they are environmentally very bad. They concentrate all these wastes. And I think it's bad in terms of human health, the hormones, and the antibiotics that they are having to use. And I think it's really a bad system that really makes cheap chicken and stuffs. But I think, that's because all these externalities are not being factored in. You have got this poultry waste that you have to dispose. It is usually bad it is just laid out on the pasture near by and there is a lot of washing into the streams. Secondly, the poultry industry is really exploitative when it comes to workers and even the farmers...I guess it is a way to make money in these rural places. But the poultry folks control every thing. They are the ones that make the money. But, also, it's bad in terms of disease. There are all these bacteria and pathogens, they all have to control by giving antibiotics. We don't really know what that's doing to the germ environment and the hormones and stuff that are going into the meat. We really don't know what is that doing to people?

Participant - A/Env/WM/4

Monoculture, suburbs, respectability, fertilizer, privilege, the American dream, consumerism—the people from the tall building live here. There are no sidewalks here in the neighborhood because they didn't build them...because the designer didn't think anyone would walk here. In my neighborhood, it's kind of like this, they put flags on the grass that have a person, a adult, a child & a dog with a circle and a 'X' that says 'Danger do not walk on this grass' because of the chemicals that have been sprayed on it. What do you do with this, what happens to the bird that comes looking for worms? This is a waste of water, this is a waste of fertilizer, this is a waste of land, this is about consumption, and this is about arrogance.

Participant - A/Env/WM/2

Although a small proportion, LAYP also attach negative values to these forms of environment. However, their comments are not as caustic, and not as ramified as those of ACTV.

Following are three quotes to exemplify this. The first two selections are from young white females on strip mall, and the third is from a middle-aged white male on the city environment.

Oh, another cement block!...I don't know, I just don't like seeing this kind of thing. It hasn't much to do, I think, with nature...these big places just put all these small businesses out of business. It is sad to see because especially, these places were there ever since I remember. This one was not. It was just a beautiful old pasture and trees and that kind of thing. And then you have just this huge lot and I think a lot of businesses are wasteful...These stores will move somewhere else and they might even build something bigger and better as far as they are concerned and it leaves an empty store and we've already got plenty of those around here.

Participant - L/WF/<40yrs/1

Wal-Mart and K-Mart. These are of course ugly nothing creative about it. It's just kind of sad to know what we are creating as American culture. I mean it's a culture of strip malls and chain restaurants...you can go anywhere in the country and have nothing individual. On one hand it is comforting to know that...it's the same thing even though it's 3,000 miles away, but I think it kind of stinks because it is a lack of character and individuality and anything makes one place stand out from another. Instead you just have K-Marts, Wal-Marts and shopping centers and strip malls all over the place.

Participant - L/WF/<40yrs/3

This I don't like at all. I'm looking at a city, it looks like Chicago. I don't have any use for big cities at all. I don't even like to drive through them or go to them. To me it's people stacked on top of people and it's just, I know it's a necessity here in the United States with as many people as we have, but I see a lots of pollution, I see a lots of cars and trains and factories and all that are very detrimental to the environment. I don't see anything pretty about a big city at all.

Participant - L/WM/40-60yrs/2

Intrinsic/existence value: While more than 60% of ACTV and NM/PF participants volunteered intrinsic or existence value, only about 36% of laypersons invoked it (Table 4.10, p. 87).

ANOVA result indicates the difference in group score means differed significantly ($F=3.26$, $p=0.044$) at the significance levels tested (see Appendix 4.11). This lead to acceptance of a part of hypothesis H_{A2} that differences in intrinsic value is a function of level of activism. However, LSD t-test indicate that the score means between ACTV and LAYP do not differ significantly, but their score means differ significantly from LAYP score mean (Appendix 4.11). Given the results, it is concluded that ACTV and NM/PF have higher level of intrinsic/existence value orientation than LAYP in the study population.

Appendix 4.16 reveals that intrinsic/existence value is associated with natural environments, particularly the logging scene, followed by arid area. The reasons for association of intrinsic value with the logging scene are primarily three: first, the tree being felled is very big and old; second, there are only a few old growth forests left in the US; and third, it is irreplaceable for it takes hundreds of years to grow a tree of that size. Size, age, and irreplaceability are the three factors that made the participants passionate, and use expressions like ‘it is sad’, ‘I feel sad’, ‘it is gut wrenching’, ‘it is disturbing’, and ‘I cringe’.

Intrinsic value by definition is the value that something has an end in itself (Meffe and Carroll 1997). Intrinsic value in its true sense is independent of whether the thing in question is scarce or abundant, and is also independent of any human thought or values, though non-anthropocentric. Thus, the intrinsic value invoked by many participants is largely circumstantial or selective in nature as determined by endangered nature of the object/s in question. In this sense, a better choice of term may be *existence value* in its literal sense. That is, mere existence of the environmental asset into the future.

Only two ACTV participants used the term *intrinsic value*. Its non-use may be primarily lack of knowledge of the term. It seems ACTV are clearer on the concept of intrinsic value than others. However, sense of intrinsic/existence value was reflective in the statements and/or comments made by them. The following five selections exemplify the intrinsic or existence value as expressed by the participants: two are ACTV, two are NM/PF, and one LAYP.

I think that there's intrinsic value in different species of animals and that they're a part of the eco system. I'm just very dubious about disrupting ecosystems willy-nilly without thinking about the consequences.

Participants - A/Env/WM/1

...a logger in the northwest cutting down some old growth timber. Gee that is really sad to see. Looks like temperate rainforest...Gee that is really too bad. Cause it is not renewable resource. Forest are renewable resource but an old growth forest like that, you would like to see the remnants. Preserve it.

Participant - A/Env/WM/4

These [wildlife] are all, I think beauty of nature...hope we can continue to enjoy for generations to come. They reflect the majesties and power of the universe and how they relate to one another. I am thankful that I am able to see many whitetail deer...The wolf has become a protected species and that is good because we hunted the wolves almost to extinction.

Participant - P/WM/>60yrs/3

Oh, boy! Look at that pretty big tree, been there for over a hundred years. Now it's being cut. We need to preserve our forests, our natural resources. I know that paper companies grow trees to manufacture paper. Paper is necessary, but don't take out trees that have been there for years. That tree is over two or three hundred years old and now it's being cut. For what? To make a book or make some paper product? That's a no-no.

Participant - P/BM/>60yrs/6

Swamp, kind of marshy, marshland...I don't know much about coastal. I don't know a whole lot of land like that...Well it's almost like it is necessary. It looks like it is necessary in a sense that it's there and that's how it is. The very fact that it is there, I mean we didn't make it like that. It's kind of like God made it like that. Or, it made itself if you want to call it that. And so it's necessary in the sense that's how it's formed.

Participant - L/WM/<40yrs/5

Religious value: Overall, about 29% of research participants volunteered religious value during the MTAT sessions. As compared to ACTV and NM/PF, LAYP are more likely to invoke religious value. About 42% of the LAYP volunteered religious value (Table 4.10, p. 87). The LAYP and religious basis correlation is also confirmed in the semi-structured ethnographic interview. The participants were asked if they had any spiritual or religious basis for the environmental value they held. Responses to the question are presented in Table 4.12. Perusal of the table shows a similarity in pattern. Of the 61 responses, 52% are religious³, primarily comprised of LAYP. Much of the non-religious basis is primarily given by ACTV followed by NM/PF. For ACTV the basis is primarily spiritual (but not religious), and for NM/PF it is a mix of religious, and spiritual depending upon ethnicity and sociopolitical ideology.

³ The discrepancy in percentage figures between the methods is due to: in MTAT it was voluntary, i.e. they were not asked except in exceptional cases, while in ethnographic interviews they were categorically asked.

Table 4.12: Spiritual/Religious basis for environmental values by level of activism

Sl	Spiritual/religious basis?	ACTV (count)	NM/PF (count)	LAYP (count)	Total	
					Count	Percent
1	Religious		4	25	29	47.5
2	Religious + intellectual		3		3	4.9
3	Spiritual, not religious	5	4	3	12	19.7
4	Practical/intellectual	1	2	1	4	6.6
5	Owe planet a reverence		1		1	1.6
6	Close to Native American belief	1			1	1.6
7	No (response was only No)	2	2	5	9	14.8
8	Never thought			1	1	1.6
9	Don't know		1		1	1.6
Total		9	17	35	61	100

Overall, as per ANOVA, the differences in groups score means do not differ significantly ($F=1.92$, $p=0.155$) (see Appendix 4.11). Thus a part of the alternative hypothesis H_{A2} that religious value is a function of level of activism is not accepted. However, LSD t-test reveal that score mean between ACTV and LAYP differ significantly (Appendix 4.11). Given the test results it is concluded that overall level of activism is not an important correlate of religious value in the sample. However, difference exists between ACTV and LAYP in terms of religious value orientation.

The participants generally associated religious value with natural environments like wildlife, logging (forest areas), arid area, stream, and wetland (see Appendix 4.17). Religious values associated with cattle pasture, chicken houses, strip mall, and sub-division were utilitarian. For example, “the Lord has given us livestock to feed us” and wise use of resources for continued use into future as a Christian belief.

The participants used phrases like ‘God’s creature’, ‘God created’, ‘God’s gift’, ‘God’s nature’, ‘God’s creation’, ‘God’s design’, ‘God gave us’, ‘God put them on earth’, ‘God made man to be custodians’, and ‘God put them here for a purpose’ to express their religious value of environment. These phrases signify “God as the creator”, “God as the provider”, and “God as the

owner of the creations, the Earth, and the environment.” The religious value held did not only tell the Earth, the nature, the environment and everything are God’s creation and belong to Him, but also prescribed that they should be taken care of, preserved, and used wisely, not abuse. And, God’s creations are unquestionably good, and have a purpose. The following quote selections from both ethnographic interview and MTAT sessions provide a sample of the religious value or belief held by the sample on environment.

The first quote is a response from a young LAYP black male to the question if he had a religious basis for environmental value. He knew he had to take care of God’s creation; but he never thought in environmental terms, but general.

The way I was taught when things are given to us by God, we should take care of it and keep it clean. I don't guess I even thought about it in that way as environment.

Participant - L/BM/<40yrs/1

The second selection is from an 81-year old lay white woman. She is a retired assistant engineer. She is a Presbyterian and attends church regularly. To her every creation has a purpose, which she accepts unquestionably. The quote is selected from her comment on arid scene.

It is a desert because God created it... anything God created I do not question. I know a lot of people, when they lose a loved one they question God why? God does not have to tell us why or when or anything, and I am never going to ask him why or why me. If He created, and everything has a purpose, we fulfill that purpose we are done.

Participant - L/WF/>60yrs/2

The third quote is from a young high school educated lay black male. He owns a small business, and is a gospel singer. The quote is from a comment he made on the stream scene in the MTAT session. To him natural environment devoid of human presence is spiritual.

When you go into environment like that, yeah, it’s spiritual. You’re saying, “God created it.” “Thank you Jesus.” And that’s how you do when you get in that area. You look it over and then you feel born again, no matter how old or grown you are when you get to that environment.

Participant - L/BM/<40yrs/3

The fourth selection is from a middle-aged high school graduate lay white male. He works for the University of Georgia as a supervisor. He is a Southern Baptist and a deacon, and teaches Sunday School. His belief: God created the Garden, so we should take care of it as good stewards. For him the dominion over the rest of the creation comes with responsibility.

Question: Do you have spiritual or religious basis for your environmental beliefs?

Answer: Oh definitely. I believe that God created the heavens and the earth and all the things in it and on it and that we should be good stewards of that. That's a very strong belief that we are to be good stewards of this land and we're to take care of it.

Question: What it means to be a good steward, what do you have to do? What do you think characterizes a good steward?

Answer: Well, first of all you don't cut trees that you don't need to cut...if you go out camping don't leave your trash and you don't throw stuff in the stream. Even, as far as, when you go camping you're not supposed to go get a bath in the stream because of the soaps and all will get in the stream. Well we make sure we don't do that...That's polluting the stream. I think that as far as my Christian values go, we've got to be good stewards of what God's given us. We have got to look after this land. And being a good steward means not polluting and not leaving trash and those kinds of things.

Question: Do you remember any verse in the Bible on good stewardship?

Answer: Well if you go back to Genesis where God created the heavens and the earth and then He fashioned man with His own hands to take care. Adam was in charge of taking care of the garden and to be good steward of that garden. It all started way back in the beginning of my belief that when He created man He put him over everything. It's our responsibility, in God's eyes, to take care of this.

Participant - L/W/M/40-60yrs/2

The final selection is from a college educated 68-year old NM/PF black male. He is Baptist and goes to church regularly. He sees the environment as God given, and a responsibility to preserve and take care of it. The quote is from the comment he made on the stream scene.

God given environment, trees, vegetation, should always be preserved. Man cannot make a river like this. They can put a dam in, they can put a canal, but only God can make a river like this. It should be preserved and taken care of, use in the proper way. He gave it to us for not to be misused. Instead of having treatment plants to treat our waste, people used to dump it right into the river and into the lakes. They let it go down the stream. That's pollution. That's not preserving it. God didn't intend for us to do it that way.

Participant - L/WF/>60yrs/2

Heritage, medicinal, and educational/scientific values: Since a few participants volunteered heritage, medicinal and educational/scientific values of environment during MTAT session, no statistical tests were run.

Heritage value is associated with both natural environment (logging, forest, arid area, and wildlife), and human modified environments (agriculture, cattle pasture, and city) (Appendix 4.12). Agriculture and cattle pasture is seen as a Southern cultural heritage, while city for its museum, architectural, and historical heritage. Natural forests, old large trees, and wildlife are also ascribed heritage value, primarily for the reason that they are endangered and scarce which needs to be preserved *in situ* for environmental history for future generations.

Research participants invoking medicinal value associated it with natural environment bodies like arid area, wildlife, forest, and wetland. The value was invoked out of concern of loss of these natural environments, and the loss of potential medicinal herbs and plants. Landfill and/or dumping in ocean is seen a cause of reef destruction and loss of seaweeds with potential medicinal values.

The research participants associated educational and scientific value with forest, arid area, and wildlife. These values were volunteered by only ACTV and NM/PF participants. They see a necessity to study the ecosystems, and plant and animal species for intellectual and scientific reasons, for the humanity does not know much about them. They also see educational value in the protection of these natural bodies for future generations. These values are invoked primarily due to their perceived loss of natural environments.

4.3.6 Differences in socio-economic-political ramifications of environment use

General distribution pattern of socio-economic-political ramification themes: The percentage of participants invoking the socio-economic-political ramification themes are

presented in Table 4.13, and the percentage score of the socio-economic-political ramification themes invoked by research participants are presented in Table 4.14. Overall, the two tables show that economy and job creation; excessive use of resources; wasteful; political, governance and policies; and sprawl and growth emerged as the most invoked themes. Perusal of the two tables reveal that of the 10 socio-economic-political ramification themes, economy and job creation is salient for LAYP, while for ACTV and NM/PF numerous themes are salient.

Table 4.13: Percentage distribution of participants by socio-economic-political ramification themes

Sl	Themes	Type	ACTV	NM/PF	LAYP	Total
1	Economy & creation of job	Socioeconomic	58.3	68.4	65.9	65.3
2	Excessive use of resources	Socioecological	91.7	94.7	39.0	62.5
3	Wasteful	Socioecological	83.3	84.2	36.6	56.9
4	Political, governance & fiscal policy	Socio-political	75.0	84.2	26.8	50.0
5	Sprawl and growth	Socioecological	91.7	68.4	29.3	50.0
6	Economics over environment/community	Socioecological	66.7	57.9	29.3	43.1
7	Socio-cultural decay or degradation	Socio-cultural	66.7	42.1	34.1	41.7
8	Out of business & Loss of job	Socioeconomic	50.0	31.6	24.4	30.6
9	Population growth/overpopulation	Socio-cultural	25.0	31.6	26.8	27.8
10	Socioeconomic inequities, exploitation	Socioeconomic	66.7	26.3	12.2	25.0
Average			67.5	58.9	32.4	45.3
Sample size (Ni)			12	19	41	72

Note: Percentage in each cell is based on corresponding sample size.

Table 4.14: Percentage distribution of socio-economic-political ramification themes by level of activism

Sl	Values	Type	ACTV	NM/PF	LAYP	Total
1	Excessive use of resources	Socioecological	23.8	15.8	13.2	17.5
2	Economy & creation of job	Socioeconomic	6.7	14.8	28.2	16.9
3	Sprawl and growth	Socioecological	20.0	14.4	7.9	13.9
4	Wasteful	Socioecological	12.4	14.4	9.7	12.1
5	Political, governance & fiscal policy	Sociopolitical	7.6	17.2	9.3	11.3
6	Economics over envt./community	Socioecological	7.1	8.1	9.7	8.4
7	Socio-cultural decay or degradation	Sociocultural	8.1	5.7	8.8	7.6
8	Out of business & Loss of job	Socioeconomic	5.7	3.3	4.8	4.6
9	Socioeconomic inequity/exploitation	Socioeconomic	5.2	3.3	3.1	3.9
10	Population growth/overpopulation	Sociocultural	3.3	2.9	5.3	3.9
Column total (percent)			100.0	100.0	100.0	100.0
Column total (count)			210	209	227	646

Note: Percentage distribution for each column is based on corresponding total count, which is the total frequency of values invoked/volunteered by participants during MTAT session.

Hypotheses testing - Results of ANOVA and LSD t-test results: Groups score means and the

results of ANOVA and LSD t-test results are presented in Appendix 4.18. The analysis results

are presented under four headings, namely, socio-political, socio-ecological, socioeconomic, and socio-cultural ramifications, which are discussed below.

Sociopolitical ramification: The differences in the groups score means for the selected sociopolitical ramification theme *political/governance/policy* differed significantly ($F=11.52$, $p=0.000$) at the levels tested (see Appendix 4.18). LSD t-test shows that score means between ACTV and NM/PF do not differ significantly, but they differ significantly from LAYP score mean. While many, especially, LAYP saw role of government in regulating growth and development and use of resources, many ACTV and NM/PF were critical of the government of not doing enough to protect environment and resources. They were also of the opinion that corporations are benefited from government policies, for example, logging. Given the test results and lower score means it is concluded that LAYP less often link environment/resource use to government and its legislation, rules and policies.

Socioecological ramification: The differences in the groups score means for the selected four socioecological ramification themes (sprawl/growth, economics over environment/community, excessive use of resources, and wasteful) were statistically significant at the levels tested (see Appendix 4.18). *Excessive use of resources* is associated with built or human modified environments, which is resource intensive. *Sprawl and growth* is associated with city, highway, subdivision, and strip mall, *the sprawl*, and also with cattle pasture, forest, wetland, and wildlife, *the affected* (see Appendix 4.19). Respondents primarily associated *wasteful* with city, landfill, manicured lawn, and strip mall. The *economics/greed over environment/community* theme is most associated with logging followed by chicken houses, factory, subdivision, and strip mall. Given the test results the alternative hypothesis (H_{A2}) of difference for these socioecological themes is accepted. ACTV has a consistently higher score means for the themes followed by

NM/PF and LAYP, indicative ACTV are most oriented to socioecological ramifications of environment use than NM/PF and LAYP.

Socioeconomic ramification: Of the three socioeconomic ramification themes, the differences in groups score means for *socioeconomic inequity/exploitation* and *out of business/job loss* themes were statistically significant (Appendix 4.18). LSD t-test shows that NM/PF and LAYP do not differ significantly, while their score means differed significantly from ACTV score mean. As expected, respondents associated the two significant themes with built environment like city and production/economic activities like agriculture, poultry, and strip mall (see Appendix 4.19).

Noteworthy is the strip mall, which they strongly associate with driving small/local businesses out of business/job loss theme. Given the test results, and score means, it is concluded ACTV are more conscious about socioeconomic ramifications of environment use than NM/PF and LAYP.

Sociocultural ramification: Of the two sociocultural themes of environment use, the differences in the score means for *population growth/overpopulation* were statistically insignificant.

However, the groups score means for *socio-cultural decay* theme differed significantly (Appendix 4.18). ACTV has highest score mean which differed significantly from score means of both NM/PF and LAYP. Score mean between NM/PF and LAYP did not differ significantly.

Sociocultural decay theme is primarily associated with city, highway, manicured lawn, and strip malls (see Appendix 4.19). The participants perceive these to have a negative impact on the socio-cultural fabric, in terms of promotion of individualism, self gratification, wealth display, loss of family and social life, among others. Based on test results and score means, it is concluded that ACTV perceive socio-cultural decay resulting from the economic growth and development a greater socio-cultural problem than NM/PF and LAYP.

4.4 Ethnic Differences in the Level of Environmental Orientation

Ethnic differences in the perceived levels of environmental orientation as defined by a) ecosystem orientation, b) environmental state orientation, c) environmental protection orientation, and d) environmental value orientation themes are presented in this section. The study is based on LAYP sample ($N_{lay} = 41$). Since there are two groups, LSD t-test was not run.

4.4.1 Perceived ecosystem, environmental state, and environmental protection orientations

Ecosystem orientation: Over all, 75.6% of the LAYP invoked ecosystem concept during the MTAT session. While a higher percentage of whites (86.7%) invoked the ecosystem concept the black sample invoked the concept more frequently as evidenced by a higher score mean (3.08). However, the difference in score means is statistically insignificant ($F=0.10$, $p=0.754$) (see Appendix 4.20). Thus, the alternative hypothesis of difference of ecosystem orientation as defined by ethnicity factor is rejected.

The black sample associated ecosystem with a wider range of environmental forms than white sample. However, both black and white samples primarily associated ecosystem with natural environments like, forest, wildlife, logging, and wetland, though they would associate ecosystem concept with built and modified environments, as well (Appendix 4.21). This tendency of associating environment with natural environment is also evident in cultural consensus analysis.

Based on these evidences, it is concluded that ecosystem orientation in the black and white sample population is statistically indifferent, which they primarily relate to natural environment, and lesser to built and/or modified environments like strip mall, dam, and city.

Environmental state orientation/awareness: The perceived level of environmental state orientation is high in both the black and white layperson samples in terms of participants

invoking environmental state and their score means (Appendix 4.20). The rates are almost identical. This similarity in environmental state orientation between the two groups is confirmed in the ANOVA. The difference in the groups score means was statistically insignificant ($F=0.67$, $p=0.418$) at the levels tested (Appendix 4.20). Thus the hypothesis of difference in the environmental state orientation in the sample as defined by ethnicity is rejected.

The no-difference result in their score means is also supported by the similarity in the pattern of association of environmental state with environmental forms for the two groups, though the white sample has consistently a little higher percentage (see Appendix 4.22). However, this difference is of no significance.

As opposed to ecosystem orientation, both the sample associated it primarily with environmental forms like factory, landfill, highway, logging, city, wildlife, forest, and strip mall, which are primarily human built or impacted substantially by human, for example, logging, wildlife, and forest (Appendix 4.22). They associated the environmental state to a lesser extent with cattle pasture, arid area, chicken houses, and manicured lawn scenes in which negative aspects of environmental quality is less obvious without scientific or text book knowledge.

Given the hypothesis test result and the cross-tabular analysis of environmental state orientation, it is concluded that a) the perceived environmental state orientation in black and white samples are statistically indifferent, and b) though the sample in general adequately associate environmental state with environmental forms where environmental quality is visually obvious, for example, factory, landfill and highway congestion, they inadequately associate environmental state with environmental forms where environmental pollution is less obvious, for example, manicured lawn, cattle pasture, and arid area.

Environmental protection and ethical orientations: Overall, a very high percentage (90.2%) of participants brought up the need to protect the environment. The percentage of black and white samples bringing up the need to protect environment and score means are similar. ANOVA indicate that the difference in the score means between the groups is statistically insignificant ($F=2.67$, $p=0.11$) at the levels tested (Appendix 4.20). The statistically insignificant difference lead to reject the hypothesis of difference in the score means between the groups.

The indifference in the score means is also supported by the similarity in the pattern of association between environmental protection and environmental forms with some variability (see Appendix 4.23). Both the samples primarily associated environmental protection with logging, wildlife, factory, and landfill, which is primarily due to obviousness of environmental degradation in these environmental scenes and their general knowledge of wildlife and its habitat loss. However, the white sample has a little higher tendency for associating environmental protection with subdivision, strip mall, forest, highway, and wetland than the black sample. But this difference is of no consequence in terms of significance of results. The lesser association of environmental protection with environmental forms like chicken house, cattle pasture, arid area, manicured lawn, river dam, and agriculture among others is in consonance with environmental state orientation, which is indicative of lower levels of environmental knowledge in the black and white layperson sample. However, given the test results it is concluded that the difference in the environmental protection orientation as defined by ethnicity is statistically invariant.

As per ANOVA results, the difference in the score means for religious-based and humane treatment of animal ethical orientation did not differ significantly. Although statistical test was not performed on communalism and stewardship ethical themes, percentage of black and white samples volunteering these themes and the groups score means for these codes are similar (see

Appendix 4.20). The sample primarily associated religious, communalism, and stewardship ethical orientations with natural environments like wildlife and logging, and humane treatment with poultry birds.

4.4.2 Ethnic differences in perceived environmental value orientation

The sample volunteered eleven value types. Consumptive and beauty are the most invoked followed by ecological and other aesthetics values, namely, psychospiritual, ugly and recreational, and a few minor value types like negative, heritage and medicinal (Appendix 4.24). Given the general similarity in pattern of percentage distribution of values invoked by participants and their corresponding score means, overall, it can be concluded that the lay black and white sample populations have identical environmental value structure, with some differences in ugly, recreational and negative value orientations.

Of the 11 value types volunteered, the groups score means for ugly ($F=4.43$, $p=0.042$), recreational ($F=9.51$, $p=0.004$), and negative ($F=5.50$, $p=0.024$) differed significantly (see Appendix 4.24). Thus the alternative hypothesis of ethnicity a significant variable in explaining ugly, recreational, and negative values of environment is accepted. The white sample has a consistently higher score means and a higher percentage of them invoking these values. These values are primarily related to aesthetics and recreational use of natural environments, although negative value has a socioeconomic dimension to it. Historically aesthetics and recreational uses of environment have been largely associated with white middle-class population. The earliest culture of recreational use of nature/wilderness in terms of national parks in the nineteenth century is related to middle-class preservationist and transcendentalist oriented American society (Steinberg 2002), comprised of white Euro-Americans. Similarly, the auto-centered recreational use of national parks in the early twentieth century and the post-World War II period are again

associated with white middle-class and affluent American society (Petulla 1988; Steinberg 2002). Perhaps, the class-based culture of recreational use of wilderness/natural parks, the historically low socioeconomic status of the black population in general, and more importantly the segregation as late as 1960s explains the lower aesthetics value orientation in the lay black sample population. A similar conclusion was arrived in a study which reported that black respondents were least likely to indicate values associated with visitation and on-site use of wilderness as compared to white respondents (Johnson, et al. 2004a). Theory exists that lack of access to natural recreational areas due to racial discrimination inhibited blacks from developing interest in and appreciation of natural environment (Mohai and Bryant 1992; Taylor 1989).

Given the ANOVA results and score means, and the lower percentage of black samples invoking these values, the alternative hypothesis of ethnicity a significant correlate in explaining ugly, recreational, and negative values of environment is accepted.

4.5 Gender Differences in the Levels of Environmental Orientation

Gender differences in environmental orientation as defined by perceived ecosystem, environmental state, environmental protection, and environmental value orientations are presented in this section. The gender difference analysis is based on LAYP sample ($N_{lay} = 41$). Since there are only two groups score means to compare, LSD t-test was not run.

4.5.1 Perceived ecosystem, environmental state, and environmental protection orientations

Ecosystem orientation: A higher percentage of male samples (86.4%) invoked ecosystem concept than female sample (63.2%). Similarly, the male sample had a higher score mean (3.86) than the female sample. ANOVA run on the theme to compare group difference in the score means gave a statistically significant ($F=5.85$, $p=0.02$) result at the levels tested (Appendix 4.25). Thus the alternative hypothesis of gender differences in ecosystem orientation is accepted.

A plausible explanation for this gender difference is due to restricted association of the ecosystem concept by female sample with the available range of environmental forms (see Appendix 4.26). Although, both the male and female samples primarily associate ecosystem with natural forms of environment than modified or built environment; males have a greater likelihood to associate the concept of ecosystem to a wider range of environmental forms. Also, the difference in ecosystem orientation in the sample as defined by gender may be due to differences in the value structure, which is discussed in the following value section.

Given the test results and tabular analysis of distribution of ecosystem orientation, it is concluded that males have a greater tendency to invoke ecosystem concept across a wider range of environmental forms, thus a higher level of ecosystem orientation than female sample.

Environmental state orientation: All male and female participants brought up environmental state/quality topic at least once during the MTAT session. But, the male sample has a higher score mean (11.14) which differed significantly ($F=8.44$, $p=0.006$) from the female sample score mean (8.32) (Appendix 4.25). Given the statistically significant difference in their score means, the alternative hypothesis of gender difference in environmental state orientation is accepted.

Although the score means are statistically different, the patterns of association of environmental state with environmental forms are similar for both the male and female samples. They primarily associated environmental state with environmental forms where the environmental quality is visually obvious, for example factory, landfill, highway congestion, logging and city (see Appendix 4.27). However, the male sample has a consistently higher percentage points across the environmental forms, which explains the difference in the sample. Given the ANOVA and cross-tabular analysis, it is concluded that the male sample has a higher level of environmental state orientation than its female counterpart.

Environmental protection and ethical orientations: About 90 percent of male and female sample invoked the need to protect environment at least once during the MTAT session.

Although, male sample has a little higher score mean (6.14) the difference is statistically insignificant ($F=1.96$, $p=0.170$) (Appendix 4.25). Thus the alternative hypothesis of difference in environmental protection orientation as defined by gender is rejected.

Given the significantly higher levels of ecosystem and environmental state orientations for male sample (see previous subsections), the lack of difference in environmental protection orientation between male and female sample is interesting. It is indicative that a significantly higher level of environmental state orientation does not translate to a significantly higher environmental protection attitude.

Although the male sample consistently volunteered higher level of the environmental protection need, the pattern of association between environmental protection need and environmental forms for both the samples is identical (see Appendix 4.28). Both the samples primarily associated environmental protection with wildlife, logging, landfill, and factory in which the environmental state/quality is visually obvious. The lower levels of association of environmental protection with chicken houses, cattle pasture, arid area, agriculture, river dam, and manicured lawn suggest a lack or lower levels of environmental state orientation and knowledge in both the male and female samples.

Given the statistical test results and cross-tabular analysis, the levels of environmental protection orientation in the female and male samples are invariant. The environmental protection is primarily associated with visually obvious forms of environmental degradation than other less obvious forms, but important causes of environmental degradation like chicken houses, manicured lawn, agriculture, cattle pasture, and city, among others.

As regards to ethical orientations, although ANOVA results suggest no gender difference in score means, female sample has a higher score mean for humane treatment and male sample has a higher score mean for religion-based ethical codes (see Appendix 4.25). ANOVA was not run on stewardship and communalism ethical orientations. Male sample has a higher score means for both the orientations, the higher score mean for stewardship orientation for male sample is interesting in the light of the paternalistic character of the code.

4.5.2 Gender differences in perceived environmental value orientation

Of the eleven value items volunteered, ANOVA was run on only nine. ANOVA indicate the groups score means for beauty ($F=7.32$, $p=0.010$), consumptive ($F=6.13$, $p=0.018$), ecological ($F=3.85$, $p=0.057$), and psychospiritual ($F=3.30$, $p=0.077$) values differed significantly at the significance levels tested (Appendix 4.29). Thus the alternative hypothesis of gender differences in value orientation in terms of these four values is accepted.

This gender differentiation in value orientation can be explained in terms of materialism associated with these values. While the male sample has higher score means for materialistic-related values, namely, consumptive (11.86) and ecological (3.09), the female sample has higher score means for non-materialistic values, namely, beauty (6.00) and psychospiritual (1.16). This is also evident in the percentage female and male respondents invoking ecological and psychospiritual values: a higher percentage of male sample (81.8%) invoked ecological and a higher percentage of female sample (73.7%) invoked psychospiritual values (Appendix 4.29). Although, the group score means are statistically insignificant, the higher percentage of female sample (52.6%) invoking humane treatment of animal and a higher percentage of male sample (22.7%) invoking stewardship/paternalistic ethical orientations are a reflection of gender differences in value orientation in the sample (Appendix 4.29).

Given the test results, it is concluded that while male sample has higher levels of materialistic value orientation, namely, consumptive and ecological, female sample has a higher level of non-materialistic value orientation, namely, beauty and psychospiritual.

4.6 Age Differences in the Level of Environmental Orientation

Age differences in environmental orientation as defined by ecosystem, environmental state, environmental protection, and environmental value orientations are presented in this section. The analyses is based on LAYP sample ($N_{lay} = 41$). Since there are three age groups, ANOVA is complemented with LSD t-test.

4.6.1 Perceived ecosystem, environmental state, and environmental protection orientations by age

Ecosystem orientation: The percentage of participants invoking the ecosystem concept is the highest (84.6%) for the age group 20-40 years, but the age group >60 years has the highest score mean (4.0). However, ANOVA ($F=1.40$, $p=0.256$) indicates insignificant difference in the groups score means, thus rejection of the alternative hypothesis of difference (see Appendix 4.30). Although the hypothesis is rejected, LSD t-test shows that the score means between 40-60 years and >60 years groups differ significantly (Appendix 4.30). Contrary to literature on new environmentalism, which associate environmentalism with younger people, the statistical indifference in the groups score means in general and the statistically different score means between >60 years and 40-60 years age group in particular is interesting.

Like other categories under study, the three age groups primarily associated ecosystem orientation with natural forms of environment like forest, wildlife, logging, and wetland (see Appendix 4.31). Although, the pattern of association between ecosystem orientation and environmental forms is similar for the three age groups, the percentage scores for >60 years age group is consistently higher than the other two age groups.

Given the test results and the association of environmental forms with ecosystem orientation, it is concluded that age is not a significant factor in explaining the ecosystem orientation in the sample and that the three age groups primarily associate ecosystem orientation with natural forms of environment than built or modified.

Environmental state orientation: Research participants of all age groups volunteered some form of environmental state during the MTAT session. As in ecosystem orientation, the age group >60 years has the highest score mean (10.00). However, difference in the score means between the age groups is statistically insignificant ($F=0.04$, $p=0.960$) (Appendix 4.30). Thus, the alternative hypothesis of difference is rejected. LSD t-test results also indicate no difference between groups score means.

This indifference in score means is also supported by the similarity in the pattern and percentage association between environmental state orientation and environmental forms for the three groups. The three age groups primarily associated environmental state with factory, landfill, highway/traffic congestion, logging, city, wildlife, forest, strip mall, and subdivision (see Appendix 4.32). However, the three age groups in general showed lower levels of association of environmental state with environmental forms like arid area, cattle pasture, wetland, stream, chicken houses, and manicured lawn because of lack of visual cues of pollution, or lack of ecological knowledge on these environmental forms.

Given the test results and the cross-tabular analysis of association of environmental state with environmental forms, it is concluded that the differences in the levels of environmental state orientation in the sample as defined by age groups is insignificant.

Environmental protection orientation: The age group 20-40 years has the highest percentage (100%) of participants invoking the need to protect environment, followed by 40-60 years and

>60 years groups. Contrary to this order, the >60 years age group has the highest score mean (6.00). However, the ANOVA ($F=0.23$, $p=0.794$) and LSD t-test results indicate that the differences in the groups score means for the sample are insignificant (Appendix 4.30). Thus the alternative hypothesis of difference in groups score means as defined by age is rejected.

This statistical non-significance in the groups score means is also supported by the similarity in the pattern of association of environmental protection with the forms of environment for the three age groups (see Appendix 4.33). The three groups primarily associated environmental protection with wildlife, logging, landfill, and factory. Primary reasons for association of environmental protection with these forms of environment are because of the visually obvious cues of pollution and that the participants are aware of loss of wildlife and its habitat. The similarity in the basis of volunteering environmental state and environmental protection orientations, suggest a positive correlation between the two. A bivariate correlation analysis of the LAYP sample indicate a strong relationship between the two ($r=.675$, $p=.000$).

Based upon the test results and the cross-tabular analysis of association between environmental forms and protection orientation, it is concluded that the levels of environmental protection orientation in the sample as defined by the age group is invariant.

As regards to ethical orientation, ANOVA and LSD t-test on religious and humane basis of ethics suggest a statistically non-significant difference in the groups score means in the sample (see Appendix 4.30). However, it is interesting that a high percentage of the 20-40 years age group participants volunteered the two ethical orientations.

4.6.2 Age differences in perceived environmental value

The value structure for the three age groups is similar (see Appendix 4.34). Beauty, consumptive, and ecological are the three primary values followed by psychospiritual, ugly,

recreational and religious as secondary. Intrinsic, negative, heritage and medicinal may be termed minor values. Given the nature of the values invoked by the participants, it can be concluded that besides the life giving consumptive and ecological values of environment, aesthetics (as represented by beauty, psychospiritual, ugly, and recreational) is a primary component of environmental values carried by the sample.

Of the ANOVA runs on nine value items, the differences in the score means for four values, namely, ugly, recreational, intrinsic, and negative values differed significantly at the levels tested (see Appendix 4.34). Thus the alternative hypothesis of difference in values is a function of age is accepted. Besides these four, although the groups score means for the psychospiritual did not differ significantly in the ANOVA, the LSD t-test indicate that the score means between the 20-40 years and >60 years age groups, and 40-60 years and >60 years age groups differed significantly (Appendix 4.34). Interesting is the results of analyses that the age group 20-40 years has a consistently higher score means for all of these five values.

LSD t-test indicate that the psychospiritual value score means did not differ significantly between 20-40 years and 40-60 years age groups, indicative that the value is of equal importance to both the age groups (Appendix 4.34). They primarily associated psychospiritual value with forest, stream, and marshland (Appendix 4.35). To them, these environments are not only beautiful, but it is peaceful, it is relaxing, it is natural, it is serene, it is primal, it is spiritual, and even religious. Interesting is the association of psychospiritual value with marshland. To them, it is no longer an environment that carry negative value, but an environment which carry psychospiritual value beyond beauty, which brings joy and wonderful feeling aesthetically and spiritually. The three selections below are a sample of quotes which express the feelings of participants.

The first is a quote from a college graduate young white male on marshland. To him marshland is not only nice, but brings wonderful feeling to him.

That's really nice. I guess it is southeastern marshland...I love to be home on the marshes...because we used to go down to Cumberland Island a lot and that is a wonderful feeling environment to me. I love to be around the marshes and the maritime forests...there is life in the environment like that...

Participant - L/WM/<40yrs/6

The second quote is from a college educated, middle aged white female. She works for insurance and handle the claims for commercial insurance. She thinks marshland is not only beautiful it is peaceful, and spiritual.

I could say that's just a beautiful picture looking at the water and the trees. But also it's a pretty picture of the marshland...what just seem pretty to me is just that there's nothing there except for what God has put there. Just imagining the wildlife and all that is there. Just the peacefulness.

Participant - L/WF/40-60yrs/5

The third and final quote is from a middle-aged white female. She works as a renovator, a space designer, and a painter. The quote is from a comment she made on the stream scene.

This is gorgeous. You want to know why I like this. Of course because it's natural, because I can almost hear the water running over the rocks and it is fresh looking and it's clean and it's sort of like taking a deep breath and just releasing it, very healing...it makes you feel happy and it makes you feel relaxed. I think it makes you feel joy. How perfect! How perfect life is when we don't mess with it.

Participant - L/WF/40-60yrs/2

Ugly value is primarily carried by the 20-40 years age group sample. LSD t-test indicate that its score mean differed significantly from 40-60 years and >60 years age groups samples (Appendix 4.34). Ugly value is primarily associated with landfill, sub-division, strip mall, and factory (Appendix 4.35). The participants used ugly not only in its literal sense, for example landfill, but also to express their dislike, for example sub-division and strip mall, which primarily arise out of the negative value that they associate with these environmental forms.

Negative value is also primarily carried by the 20-40 years group sample. The score mean for this age group is higher and significantly different from 40-60 years and >60 years age

groups (Appendix 4.34). Negative value in the sample is primarily associated with strip mall, subdivision, highway/congestion, and mass poultry production (see Appendix 4.35). Negative values expressed by them are corporation taking over small local businesses, homogeneity, loss of family and socio-cultural life, and, to top, environmental degradation.

Recreational value is again primarily held by the 20-40 years age group sample. While 77% of the 20-40 years age group sample invoked it, only 38% and 17% of the 40-60 years and >60 years age group samples volunteered it, respectively. ANOVA indicate a significantly different groups score means ($F=5.94$, $p=0.006$) (see Appendix 4.34). LSD t-test also indicates that the score mean for the 20-40 years age group differed significantly from the other two age groups. Based on statistical test results, alternative hypothesis of age difference in recreational value is accepted. Recreational value is primarily associated with the recreational use of natural forms of environment like arid area, river dam (though modified), forest, stream, wetland, and wildlife (see Appendix 4.35).

Intrinsic value is also held primarily by the 20-40 years age group sample. LSD t-test results indicate that the score mean for the group differed significantly from 40-60 years and >60 years age group samples (Appendix 4.34). Intrinsic value is primarily associated with arid area and logging. Although the sample did not explicitly use the term *intrinsic*, they used expressions like “it is necessary in the sense how it is formed”, “we would not have to be cutting natural trees now”, “nature is existing as it is supposed to be”, among others. As in the full sample, the layperson sample also associated intrinsic value with very old trees, for reasons of its irreplaceability, sadness generated by felling such large majestic trees, and the little old growth forest left in the country.

Given the test results, it is concluded that besides consumptive and ecological values of environment, aesthetics is an important value component in the value system of the sample. However, age differences have a bearing on the value orientations held by the sample. Younger persons are more likely to be perceptive to aesthetics (as represented by psychospiritual, ugly and recreational values), intrinsic and negative values than persons of older age groups, especially, persons over 60 years of age.

4.7 Education Differences in the Level of Environmental Orientation

Education differences in the level of environmental orientation in the sample are studied as defined by differences in ecosystem, environmental state, environmental protection, and environmental value orientations. The study is based on the layperson sample ($N_{lay}=41$). Given the categorization of educational levels into three groups, hypothesis testing with ANOVA is complemented with LSD t-test to detect the group differences, if any.

4.7.1 Perceived ecosystem, environmental state, and environmental protection orientations by education

Ecosystem orientation: While a large percentage of UG sample (81.8%) invoked the ecosystem concept, the <UG sample invoked the concept most frequently. However, ANOVA indicate that the groups score means in the sample is statistically insignificant ($F=0.60$, $p=0.552$) at the levels tested (see Appendix 4.36). Also, LSD t-test did not show any significant difference in the score means between the three groups. Given these test results the alternative hypothesis of difference as defined by level of education in the sample is rejected.

An examination of the association of ecosystem orientation with environmental forms suggests that the pattern of association between them is similar for the three age groups (see Appendix 4.37). They primarily associated ecosystem with natural forms of environments like forest, wildlife, wetland, and logging, which confirms to earlier findings for gender, ethnicity,

and age. And, this pattern also conforms to the general pattern in the sample. Given the test results and the cross-tabular analysis, it is concluded that the levels of ecosystem orientation in the sample as defined by levels of education is invariant.

Environmental state orientation: Although the percentage of participants invoking environmental state is identical, there is some variability in terms of mean score for the three groups. However, ANOVA ($F=0.48$, $p=0.623$) and LSD t-test indicate that this group variation is statistically insignificant at the levels tested (Appendix 4.36). Thus the alternative hypothesis of difference as defined by education level is rejected. The three groups primarily associated environmental state with factory, landfill, highway/congestion, logging, city, wildlife, forest, strip mall, and subdivision with minor differences in percentage scores (see Appendix 4.38). Similarly, the groups in general tended to show lower levels of association between environmental state and environmental forms like arid area, cattle pasture, chicken houses, and manicured lawn. Although, there is similarity in the pattern of association for the three groups, the >UG group has a consistently higher percentage score than the two groups. However, this difference is of little significance in terms of groups score means. Thus, given the ANOVA, LSD t-test and the cross-tabular associational analysis, it is concluded that the environmental state orientation in the sample as defined by level of education is invariant.

Environmental protection orientation: Appendix 4.36 reveals that the >UG and UG groups have higher score means (6.50 and 6.45, respectively) than the <UG group (4.50), indicative that education has some form of effect on the levels of environmental protection orientation held. However, both ANOVA ($F=1.58$, $p=0.220$) and LSD t-test indicate that this difference is statistically insignificant at the levels tested (Appendix 4.36); thus the alternative hypothesis of difference as determined by level of education is rejected.

Although there is some variability in the percentage scores, the three education groups primarily associated environmental protection with logging, wildlife, landfill, and factory (Appendix 4.39). The pattern of association between environmental protection and environmental forms is similar for the groups, although UG and >UG groups have a consistently higher percentage scores than <UG group. Given the test results and the primary pattern of association between environmental protection and forms of environment it is concluded that the environmental protection orientation in the sample as defined by education is indifferent.

4.7.2 Education differences in environmental value orientation

Although there is some variability in terms of percentage of participants invoking the values, there is a general agreement in terms of primary values, namely, beauty, consumptive, and ecological between the groups (see Appendix 4.40). Of the ANOVA runs on nine value items, the groups score means for psychospiritual value only differed significantly ($F=3.78, p=0.032$) at the levels tested (Appendix 4.40). Thus the alternate hypothesis of difference for psychospiritual variable is accepted. However, LSD t-test indicates that the score mean for UG differed significantly only from <UG group score mean (Appendix 4.40). A plausible explanation to link UG and psychospiritual is difficult to establish. Perhaps it is primarily an interaction of age and education. This is supported by a) the higher score means for aesthetics-related values for the 20-40 years age group (see previous subsection) and b) the distribution of UGs by age⁴. ANOVA results show that the differences in groups score means for ugly, recreational, and negative values are statistically insignificant. However, LSD t-test shows that UG group has a higher score mean for these values, which differed significantly, variously, from <UG and >UG groups score means (see Appendix 4.40). Given the test results and

⁴ Of the 11 UGs, 4 belong to 20-40 years, 4 belong to 40-60 years, and 3 belong to >60 years groups.

interaction between age, education, and aesthetics-related values, it is concluded that group score mean for psychospiritual, ugly, recreational, and negative values for younger and college undergraduates are likely to differ significantly from <UG and >UG groups score means.

4.8 Summary and Conclusions

Chapter 4 dealt with testing the six broadly defined hypotheses to study differences in the perception of the environment in the sample as defined by level of activism, ethnicity, gender, age, and education as independent variables. Perception study based on level of activism used the full sample ($N_{full}=72$)⁵, while the perception study based on ethnicity, gender, age and education used the only-layperson sample ($N_{lay}=41$). Perception of environment was operationalized by studying what constitutes environment, and perceived ecosystem, environmental state, environmental protection, and environmental value orientations in the sample. However for perception study based on level of activism another dimension was added, i.e., the perceived socio-economic-political ramifications of environment use. The data for these studies primarily came from card sorting exercise, and modified thematic apperceptions test with a set of seventeen photographs depicting various environmental forms. Cultural consensus analysis, ANOVA, LSD t-test, and simple cross-tabular analysis were performed to study and test hypotheses.

The first objective was to study cultural consensus in the sample on what constitutes environment. The result of the cultural consensus analysis indicated the One Culture assumption hypothesis (null) true. Thus the alternative hypothesis H_{A1} of lack of consensus was rejected. However, the cultural consensus analysis extracted seven factors, indicative of more than one way of defining environment. The first factor explained only 52.3% of the total variance.

⁵ A total of 79 participants were interviewed. But there were only 72 usable transcriptions. Therefore, $N_{full}=72$. However, the cultural consensus analysis had 76 participants for analysis.

Therefore a hierarchical cluster analysis was performed using the seven factors. The analysis identified three distinct clusters, and a group of outliers. The basis for clustering was natural objects, built objects, and microorganisms. The first cluster defined environment to include both natural and built objects. The second and third clusters defined environment to include only natural objects; excluded built objects. The two, however, was differentiated by the inclusion or non-inclusion of microorganism to define environment.

The second research objective of the chapter was to study the differences in the perception of environment as defined by level of activism. The broadly defined alternative hypothesis H_{A2} was to test that a differential exists between the levels of activism in the perception of the environment as defined by ecosystem, environmental state, environmental protection, and environmental value orientations; and perceived socio-economic-political ramifications of environment use. ANOVA runs on ecosystem, environmental state, and environmental protection orientations identified the presence of statistically significant difference in the groups means score for the three levels of activism (ACTV, NM/PF, and LAYP). ACTV had a consistently higher score means and LAYP a consistently lowest score means, indicative that level of activism is an important determinant in explaining the levels of ecosystem, environmental state, and environmental protection orientations in the sample. Thus the H_{A2} of difference of score means in terms of ecosystem, environmental state, and environmental protection orientations were accepted.

The research participants volunteered twelve values, namely, consumptive, beauty (pleasing to the eyes only), ecological, psychospiritual, ugly, recreational, negative, intrinsic, religious, heritage, medicinal, and educational/scientific. Consumptive, aesthetics (beauty, ugly, recreational), and ecological were identified the three primary values. Negative value was an

important finding, which was salient for ACTV and NM/PF. Religious value was identified salient for LAYP. ANOVA was run on eight values. Differences in the groups score means for five values, namely, beauty, ecological, recreational, negative, and intrinsic/existence differed significantly. Thus the H_{A2} of difference in the mean scores for these five values are accepted. While beauty was salient for LAYP; negative and ecological values were salient for ACTV; and recreational and intrinsic values were equally salient for ACTV and NM/PF.

Ten themes (from MTAT) were selected to study the socio-economic-political ramification of environment use. Political/governance/policies theme was selected to study socio-political ramification. Four themes, namely, excessive use of resource, wasteful, sprawl and growth, and economics over environment/community were selected to study socioecological ramifications. Three themes, namely, socioeconomic inequity/exploitation, and economy/job creation were selected to represent socioeconomic ramification. And, population growth/overpopulation and socio-cultural decay were selected to study socio-cultural ramifications. Of these ten themes, differences in groups score means for seven were statistically significant at the levels tested. ACTV and NM/PF had a consistently higher score means for these seven themes, indicative that the two sample groups more frequently invoke these themes than LAYP, alternatively LAYP sample do not adequately link the sociocultural, economic, and political ramifications of environment use. Thus the alternative hypothesis H_{A2} of difference in the perception of socio-economic-political ramifications of environment use is accepted.

The third research objective for the chapter was to study ethnic differences in the perception of the environment in the layperson sample. The broadly defined alternative hypothesis H_{A3} was to test that there are ethnic differences in the perception of the environment as defined by ecosystem, environmental state, environmental protection, and environmental

value orientations. ANOVA on ecosystem, environmental state, and environmental protection orientations themes indicated a statistically insignificant difference in the groups score means. Thus alternative hypothesis H_{A3} of difference in terms of these themes was rejected. This finding is interesting in the light that the results contrast literature on environmentalism which primarily suggests blacks to be less pro-environmental than their white counterparts. ANOVA runs on values suggest that the two ethnic groups differed significantly on ugly, recreational, and negative values orientations, which are primarily aesthetics related. The white sample had a significantly higher score means for these values. Thus the alternative hypothesis H_{A3} of difference in value orientation in terms of ugly, recreational, and negative was accepted. This difference in value orientations is explainable in terms of the historically class-based origin of aesthetics- and recreation-based new environmentalism that began in the mid-nineteenth century, historically low socioeconomic status of black population, and discrimination against black population as late as 1960s.

The fourth research objective was to study the gender differences in the perception of the environment in the layperson sample. The broadly defined alternative hypothesis H_{A4} was to test that there are gender differences in the perception of the environment as defined by ecosystem, environmental state, environmental protection, and environmental value orientations. ANOVA indicate that ecosystem orientation, environmental state orientation, and beauty, psychospiritual, consumptive, and ecological value orientations differed significantly between the two groups. Thus the alternative hypothesis of difference in the sample in terms of ecosystem and environmental orientations, and beauty, psychospiritual, consumptive and ecological value orientations is accepted. It is interesting to that though the male sample had a higher level of ecosystem and environmental state orientations, the two groups did not differ in their

environmental protection orientation/attitude, suggesting that higher levels of ecosystem and environmental state orientations do not necessarily translate to appropriate levels of environmental protection attitude. The other interesting gender difference findings is the non-material based value orientation (beauty and psychospiritual) of female sample, and material-based value orientation (consumptive and ecological) of male sample.

The fifth research question of the chapter was to study the age differences in the perception of the environment. The fifth alternative hypothesis H_{A5} was broadly defined to test that there are age differences in the perception of the environment as defined by ecosystem, environmental state, environmental protection, and environmental value orientations. ANOVA results indicate that the groups did not differ in terms of ecosystem, environmental state, and environmental protection orientations. However, the age groups differed significantly on four value orientations, namely, ugly, recreational, intrinsic, and negative. Thus the alternative hypothesis of difference for these value orientations was accepted. It is interesting to note that the 20-40 years age group had a consistently higher score means for these values, suggesting that younger people are more aesthetics, biocentric, and socioecological oriented than the other two older age groups.

The sixth and final research question was to study education differences in the perception of environment in the layperson sample. The alternative hypothesis H_{A6} was broadly defined to test education differences in the perception of the environment as defined by ecosystem, environmental state, environmental protection, and environmental value orientations. Surprisingly, level of education had no significant effect on the ecosystem, environmental state, and environmental protection orientations in the sample. However, psychospiritual value orientation differed significantly in the sample as defined by education level. Thus the alternative

hypothesis of difference in terms psychospiritual value orientation was accepted. Although, the UG group had the highest score means, it did not differ from >UG group score means, it differed only from <UG group. A plausible explanation in the difference in psychospiritual value orientation is an interaction effect of age and education level, which is reflected in the aesthetics oriented values held by the 20-40 years age group in particular, and the distribution of UG, i.e., most 20-40 years and 40-60 years age group participants belonged to UG education category.

Given the research findings and hypotheses test results, the following conclusions are made on the study of perceptions of the environment in the sample.

Although there is a consensus in the sample that built and natural environment or environmental objects constitutes environment, two other alternative ways to define environment exist in the sample. The factors or criteria for this differentiation are built objects, natural objects, and microorganisms. The first group included both built and natural objects to define environment, while the other two groups excluded built environment from their definition of environment. To them only natural environment is environment. Microorganism was the factor that differentiated the two other ways: one included microorganism in their definition of environment, while the other did not.

Level of activism was identified to be an important determinant in explaining the perceived environmental perception/orientation differences in the sample as defined by ecosystem, environmental state, environmental protection, and environmental value orientations. ACTV sample consistently had the highest level of environmental and socio-economic-political ramification orientations followed by NM/PF and LAYP samples.

There were no significant ethnic differences in the environmental perception, although the white sample significantly carried higher levels of aesthetics related values, namely, ugly,

recreational, and negative values, which have historical roots. They are: a) white middle class-based origins of aesthetics- and recreation-based modern environmentalism during the mid-nineteenth century, b) historically persistent lower socioeconomic status of black population, and c) segregation policies that discriminated against black population as late as 1960s.

Gender was identified an important factor in explaining environmental perceptions and values. Male sample had a higher level of environmental orientation in terms of ecosystem and environmental state orientations; however the groups did not differ in terms of environmental protection orientation or attitude. Female sample carried a significantly higher level of non-materialistic values, namely, beauty and psychospiritual, while the male sample carried a significantly higher level of materialistic values, namely, consumptive and ecological.

Age was not a significant factor in explaining environmental orientations as defined by ecosystem, environmental state, and environmental protection orientations. However, it was identified important in explaining four values, namely, ugly, recreational, intrinsic, and negative. The age group 20-40 years consistently had higher levels of orientations for these values, indicating younger sample to be aesthetics, biocentric, and socioecological oriented than the other two older age groups.

Contrary to expectations, education was not an important factor in explaining the perceived environmental orientation in the sample. However, education was a significant factor in explaining the psychospiritual value in the sample. The UG group had the highest level of psychospiritual value orientation. Noteworthy, education was significant in explaining the differences between UG and <UG groups only, difference between UG and >UG groups was not significant. Given the age group 20-40 years carry significantly higher levels of aesthetics related values and the distribution of UG across the three age groups (fewer UGs in the >60 years age

group), the difference is more an interaction effect of age and education than only education.

Thus, the overall significance of education in explaining the perceived environmental orientations in the layperson sample is further reduced.

CHAPTER 5: ENVIRONMENTAL CONCERNS

If we don't start taking care of it [environment], maybe we're all going to have to walk around with gas masks on. We're killing ourselves.

Young white female

It's an unquestionable responsibility. It's a source of life for you.

Young black female

5.1 Introduction

In opposition to the American *dominant social paradigm*, the seeds of modern American environmentalism had been sown in the mid-nineteenth century at the initiative of white middle class romanticists/transcendentalists, and preservationists concerned with the depletion of wilderness. They argued for the intrinsic worth of the nature and called for governmental protection of forests and wilderness to preserve them for future generations (Albrecht, et al. 1982; Dunlap and Van Liere 1978a; Steinberg 2002; Taylor 2002). The pre-new environmental movement era (before 1960) was characterized by a preponderance of recreationists, scientific and technical professionals, opposition to dam building, and individual enthusiasts who advocated protection of nature/wilderness, and wise use of resources (Taylor 2002; Wells and Schwartz 1997).

However, in the 1960s emerged a new environmental movement, which unlike the earlier nature/wilderness-centered environmentalism, was multifaceted. Besides a series of ecological disasters and superheated political climate, the publication of Rachel Carson's *Silent Spring* in 1962 is credited with igniting the new environmental movement and mobilizing a large numbers

of people hitherto uninvolved in environmental activities (Clarke and Cortner 2001; Rothman 2000; Steinberg 2002; Stern, et al. 1995b; Taylor 2002). This movement led to a shift in environmental paradigm and raised the level of awareness of the American public in general (Albrecht, et al. 1982; Dunlap and Van Liere 1978a). Following the movement, polls and research show high levels of environmental concern (~90%), a large proportion of the population (75-80%) claim to be environmentalists, stabilization of social bases of environmental concern, and cultural changes in terms of shifts in language (Axelrod and Lehman 1993; Bardes and Oldendick 2000; Erikson and Tedin 2001; Jones and Dunlap 1992; Kempton, et al. 1995).

The primary goal of this chapter is to study the levels of environmental concerns in the study population and examine the variations as defined by levels of activism, ethnicity, gender, age, and education. The data to study the environmental concerns are primarily derived from the MTAT session with a set of seventeen pictures. While content analyzing interview transcriptions from MTAT, coding for environmental state orientation/awareness was done, to represent both the positive and negative statuses of environment as indicated by research participants. Positive environmental status was coded when participants mentioned the environmental quality is good, untouched, pristine, or looks good. Negative status was coded when the participant mentioned environmental degradation in various forms—for example, wildlife habitat loss, loss of biodiversity, need more recycling, air pollution, soil erosion, and ground water contamination, among others—or expressed their concerns in terms of resource use, for example, excessive use, wasteful, need more recycling, or need sustainable use of resources. Environmental concern was coded for when research participants brought up environmental pollution and degradation or resource use issues and topics. Environmental concern was coded only once for a picture, though a participant might bring up environmental degradation topic more than once. A count of the

concern scores across the pictures was made to derive the environmental concern variable for analysis. Given the set of seventeen pictures, the maximum score possible is seventeen; the higher the score the higher the concern.

Analysis of variance was run on the derived environmental concern scores (count) to test the alternative hypothesis of difference by comparing groups score means for the socio-cultural variables under study, namely, level of activism, ethnicity, sex, age, and level of education (also see Chapter 3, and Nazarea 1999 and Nazarea et al. 1998). Hypothesis was tested at three levels of significance: $\alpha=0.01$, $\alpha=0.01$, and $\alpha=0.10$. While, difference in the environmental concern by level of activism was studied in the full sample ($N_{full}=72$), differences in the concern by ethnicity, gender, age and education were studied in the layperson sample ($N_{lay}=41$). LSD t-test was run for variables with more than three categories of participants, viz., level of activism, age, and education, to study which groups score means differed significantly. The hypothesis test results are supported by statistical and cross-tabular analyses to study distribution and to describe the causes of variation. Environmental concern distribution was studied by categorizing environmental concern scores into three categories, namely, low, moderate, and high. These categories were derived based upon sample mean (10.5), and minimum and maximum scores. Environmental concern scores below mean (10.5) were categorized low, scores between 10.5 and 14 were categorized moderate, and scores above 14 were categorized high.

5.2 Results of Analysis of Variance on Environmental Concern

5.2.1 Environmental concerns by levels of activism

Although all research participants (100%) of all categories expressed their environmental concern during MTAT session, their levels of concerns differed significantly ($F=39.77$, $p=0.000$) (see Appendix 5.1). The ACTV had the highest score mean (14.67) followed by NM/PF (12.53)

and LAYP (8.46), which differed significantly between them as per LSD t-test results (see Appendix 5.1). Thus based upon the test results, the alternative hypothesis H_{A7} of difference in environmental concern by level of activism is accepted.

A distributional analysis based upon environmental concern categories shows that a large proportion of ACTV fell in the high (58.3%) and moderate (33.3%) categories, an overwhelming percentage of NM/PF (89.5%) fell in the moderate category, while a large percentage of LAYP (75.6%) fell in the low category (Figure 5.1). Study of Figure 5.2 shows that a large percentage of ACTV are clustered around environmental score counts of 14-17, NM/PF are clustered around 12-14, while LAYP are spread variably from as low as 3 to as high as 15, indicative of presence of a large variability in terms of environmental concern scores in the LAYP sample. This variability combined with lower score means for LAYP is indicative that laypersons do not see environmental problems in all forms of the environment represented in the pictures. For example, the green lawn or the beautiful stream; where as activists and professionals see environmental problems in most pictures. This pattern was noticeable during the interviews with the research participants. Laypersons did consistently bring up issues of environmental pollution/degradation and resource use when they saw pictures of interstate highways, landfill, or factories. However they generally failed to bring them up while dealing with pictures of stream, cattle pasture, and manicured green lawn, among others. To them these pictures were beautiful, undisturbed, unpolluted, and pleasing. Many laypersons either wanted to own a beautiful house or own a house with beautifully manicured green lawn. Presented below is a cross-table which shows the association of negative (concern) and positive (good) environmental statements made by research participants with the forms of environment represented in the pictures.

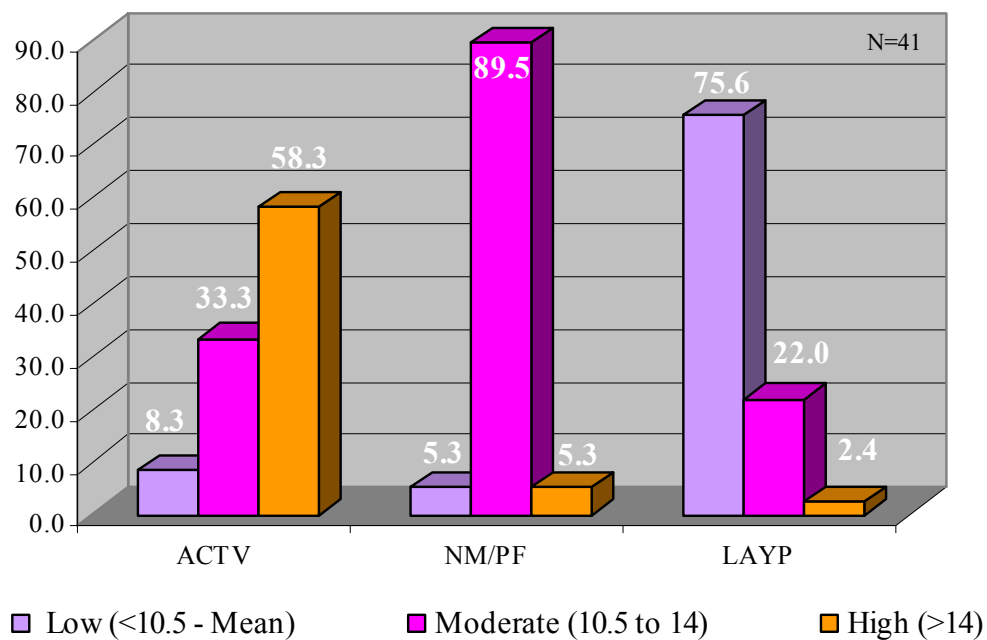


Figure 5.1: Percentage distribution of participants by environmental concern categories and level of activism

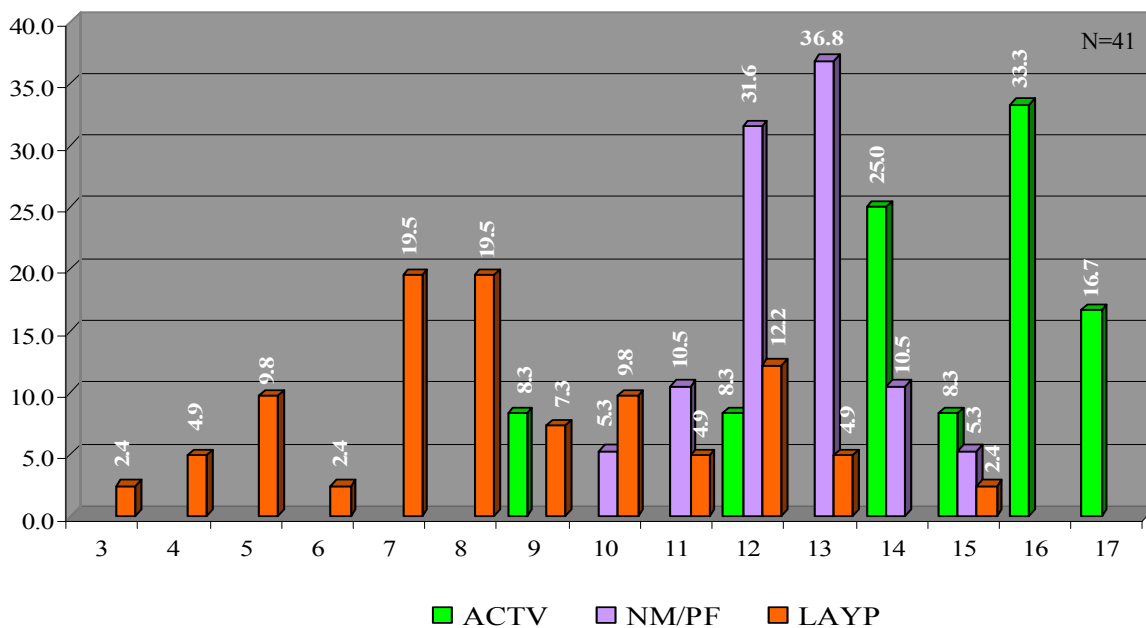


Figure 5.2: Percentage distribution of participants by environmental concern score and level of activism

Table 5.1: Distribution of environmental state association by level of activism

(in percentage by environmental forms)

Sl	Environmental forms/scenes	ACTV		NM/PF		LAYP	
		Negative	Positive	Negative	Positive	Negative	Positive
1	Factory	100.0		100.0		97.6	
2	Highway/traffic congestion	100.0		94.7		92.7	
3	Logging (sawing a tree)	100.0		94.7		85.4	19.5
4	Strip mall	100.0		100.0	0.0	61.0	
5	Sub-division	100.0		94.7		51.2	7.3
6	Agriculture	100.0		73.7	5.3	46.3	2.4
7	Manicured lawn	100.0		89.5	10.5	29.3	7.3
8	Landfill	91.7		94.7		95.1	
9	Wildlife	91.7		78.9	10.5	51.2	22.0
10	Chicken houses	91.7		68.4		26.8	2.4
11	City	83.3	33.3	100.0	10.5	80.5	
12	River dam	83.3		94.7	5.3	34.1	9.8
13	Cattle pasture	83.3	25.0	42.1	10.5	14.6	7.3
14	Forest	75.0	83.3	31.6	73.7	26.8	51.2
15	Wetland	66.7	83.3	36.8	78.9	19.5	34.1
16	Arid area	58.3	91.7	21.1	47.4	7.3	17.1
17	Stream	41.7	66.7	36.8	42.1	26.8	19.5
	Average	86.3	22.5	73.7	17.3	49.8	11.8
	Sample size (Ni)	12		19		41	

Table 5.1 reveals that ACTV associate environmental degradation or problems with all forms of environment. On average 86.3% of ACTV participants associate environmental problems with the pictures, with a range of 41.7 to 100.0%. ACTV primarily associated positive environmental statement with arid area, forest, wetland, and stream. However, they also associated them with environmental problems, primarily in the form of human impact and encroachments. Noteworthy, although they saw city primarily a reason for environmental maladies, they also saw it as a solution primarily because of high density living which put less strain on resources, as compared to sprawl. Although, the percentage score for association of environmental concern with environmental forms is lower for NM/PF, the pattern is similar to ACTV (see Table 5.1). On average 73.7% of the NM/PF participants associated environmental problems with the pictures. However, LAYP, on the other hand, averaged only 49.8 percent. They primarily associated environmental concerns with factory, highway, logging, strip mall, subdivision, landfill, wildlife, and city. This is primarily for the reason that environmental

problems associated with factory, landfill, city, and highway/congestion were obvious to LAYP because of the visual cues. Also, they had knowledge of environmental degradation associated with some forms of environment. For example, almost everyone associated city and highway with automobile and air pollution. However, noteworthy among these is strip mall and subdivision. To LAYP participants, absence of greenery and trees are negative aspect of environmental quality. Thus, the primary concern associated with subdivision and strip mall was lack of trees. The LAYP sample was knowledgeable about loss of wildlife and its habitat. Overall, 70.7% of LAYP invoked loss of wildlife and its habitat loss as a problem (Appendix 5.2), which they associated with the wildlife collage and logging scene. However, the LAYP did not associate environmental degradation/concern with benign looking environmental forms, for e.g., cattle pasture, manicured lawn, wetland, stream, and chicken houses. This incapacity of LAYP to discern environmental degradation not only explains the low levels of environmental concerns, but also low levels of ecological knowledge, an important intervening variable.

Environmental degradation and resource use problem⁶ themes volunteered by research participants to express their environmental concerns are presented in Appendix 5.2. A study of them will throw some light how the difference in environmental knowledge determines the concerns volunteered, as defined by level of activism.

Of sixteen environmental concern-related themes LAYP are primarily aware of simple forms of environmental degradation (100.0%), physical degradation of landscape⁷ (78%) and loss of wildlife and its habitat (70.7%). Secondarily, they are aware of ecosystem threat and

⁶ There are eight resource use problem-related themes, and eight environmental degradation-related themes.

⁷ Examples of physical degradation of landscape reported by participants are: trashing, clear cut, encroachment, asphaltting, exposed earth/ground, deforestation, forest eliminated, natural setting destroyed, greenspace disappearing, trees gone, among others.

alteration⁸ (41.5%), waste management and recycling (48.8%), excessive use of resources (39.0%), and the need for alternate methods (39%), among others (Appendix 5.2). Given the percentage of participants volunteering environmental concern-related themes, the LAYP sample is least oriented towards environmental problems like loss of biodiversity, sustainable use of resources, loss of medicinal plants followed by sprawl, and complex forms of environmental degradation—example, global warming/climate change, run-off and associated pollution, heavy metals, non-point source, groundwater recharge, and nutrient runoffs, among others).

Out of ANOVA runs on 13 themes, only three themes emerged non-significant. They are, namely, simple environmental degradation, population growth, and efficient/less use of resources (Appendix 5.2). Simple form of environmental degradation is the only non-significant theme with a very high percentage of LAYP participants (100%) volunteering it. Population growth and efficient/less use of resource themes are not significant; however, only 27% of the LAYP volunteered them, respectively (Appendix 5.2). This finding is indicative that laypersons in general are environmentally concerned; however, the concern is explainable only in terms of simple forms of environmental degradation. Implication of this finding is the necessity to appropriately interpret poll and other research results on public environmental concerns.

However, given the test results and cross-tabular analysis, it is concluded that level of activism is an important factor in explaining levels of environmental concerns in the population.

5.2.2 Ethnic differences in environmental concerns

Although the white sample has a little higher score mean than the black sample, ANOVA results indicate that the difference in the groups score means do not differ significantly ($F=0.87$,

⁸ Examples of ecosystem threat and alteration are invasive species, balance of nature, loss of old growth forest, fragile ecosystem, destruction of reefs, salmon cannot go up due to damming, altered ecosystem due to damming, affected hydrology, over manipulation of environment, loosing all too many wetlands, not good for aquatic creatures, and others.

$p=0.357$) at the levels tested (see Appendix 5.3). Thus the alternative hypothesis H_{A7} of difference in the environmental concern score means for the ethnicity variable is rejected. This finding is particularly interesting in the light that traditionally by most accounts blacks are rated lower than whites, though later studies indicate similar or higher levels of environmental concern for blacks in comparison to whites (Arp III and Kenny 1996; Jones and Carter 1994; Mohai 1990; Parker and McDonough 1999). The insignificant difference is also evident in the distribution of black and white participants by environmental concern categories (Figure 5.3).

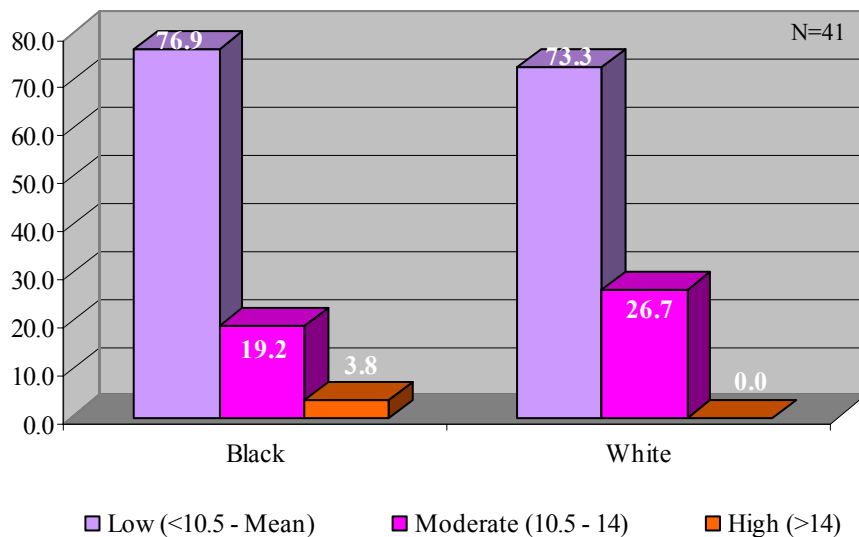


Figure 5.3: Percentage distribution of participants by environmental concern categories and ethnicity

A large percentage of both the black and white samples fell in the low concern category, with almost an identical distribution. However, there is some variability in the distribution of environmental concern score counts between black and white samples. While the environmental concern score for the black sample is spread between 3 and 15, the white sample is clustered between 7 and 12 indicative of greater variability in the black sample (Figure 5.4). However, this difference has no significance in terms of groups score means as evidenced by ANOVA.

The similarity in the distribution of participants by environmental concern category is also reflected in their association of negative (environmental concern) and positive (good) environmental status with environmental forms represented in the pictures. Except for a little difference (subdivision and wildlife), the pattern of association is alike for the black and white samples (see Appendix 5.4). The two groups primarily associated environmental concern with logging, factory, landfill, highway/congestion, and city. They little associated environmental concern with arid area, cattle pasture, wetland, stream, manicured lawn, forest, chicken houses,

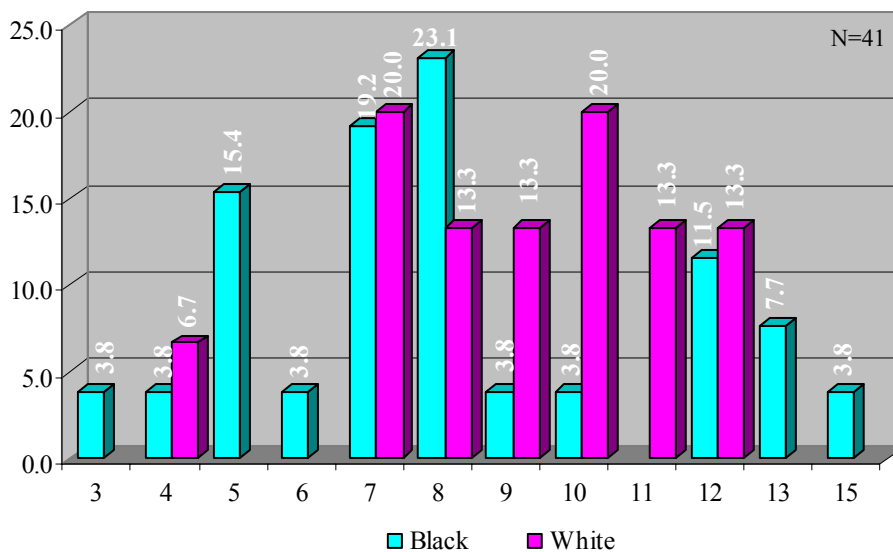


Figure 5.4: Percentage distribution of participants by environmental concern score and ethnicity and river dam. This is supportive of similarity in environmental concern orientation of black and white samples in the study population.

The similarity in groups score means (Appendix 5.3), distribution of environmental concern categories (Figure 5.3), association of environmental concern with environmental forms (Appendix 5.4), is also supported by environmental concern-related themes (see Appendix 5.5). Both the groups primarily volunteered simple forms of environmental degradation, physical degradation of landscape, and loss of wildlife and its habitat as important problems. The two

groups differed in terms of environmental concern-related themes of secondary importance. The white sample consistently had a little higher score means for the themes. ANOVA run on the 13 environmental concern-related themes indicated significant differences in groups score means in only two themes at the levels tested (Appendix 5.5). The white sample had significantly higher score means for *excessive use of resources* ($F=2.96$, $p < 0.10$) and *wasteful* ($F=5.49$, $p < 0.05$) themes. However, overall, the ANOVA results are an attestation to similarity in the two groups with regards to their perception of environmental concerns.

Given the ANOVA result on environmental concern score, distribution of environmental concern categories for the two groups, association of environmental concern with environmental forms, and results of ANOVA on environmental concern-related themes, it is concluded that ethnicity variable is not an important determinant in explaining differences in environmental concern in the sample.

5.2.3 Gender differences in environmental concerns

The male sample had a higher environmental concern score mean (9.36) than the female sample (7.42), which differed significantly ($F=5.48$, $p < 0.05$) at the levels tested (Appendix 5.6). Thus the alternative hypothesis H_{A7} of difference in the environmental concern score means as defined by gender is accepted. A distributional study of the sample shows that about 90% of the female fell in the low environmental concern category, while only 64% of the male samples fell in the same category (Figure 5.5). The distribution of samples by environmental concern score counts show that the male distribution gravitated towards the higher score end, while the female sample primarily clustered around 7 and 9 (Figure 5.6), which explains the difference.

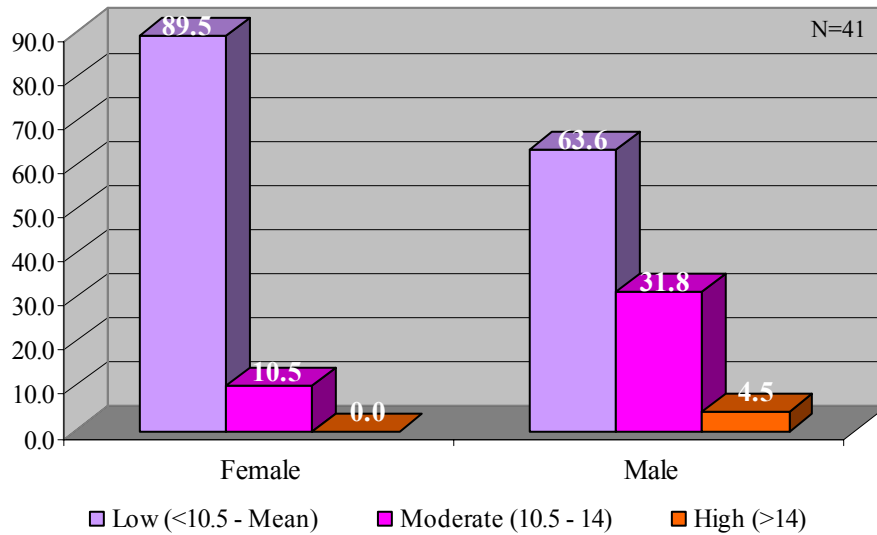


Figure 5.5: Percentage distribution of participants by environmental concern categories and gender

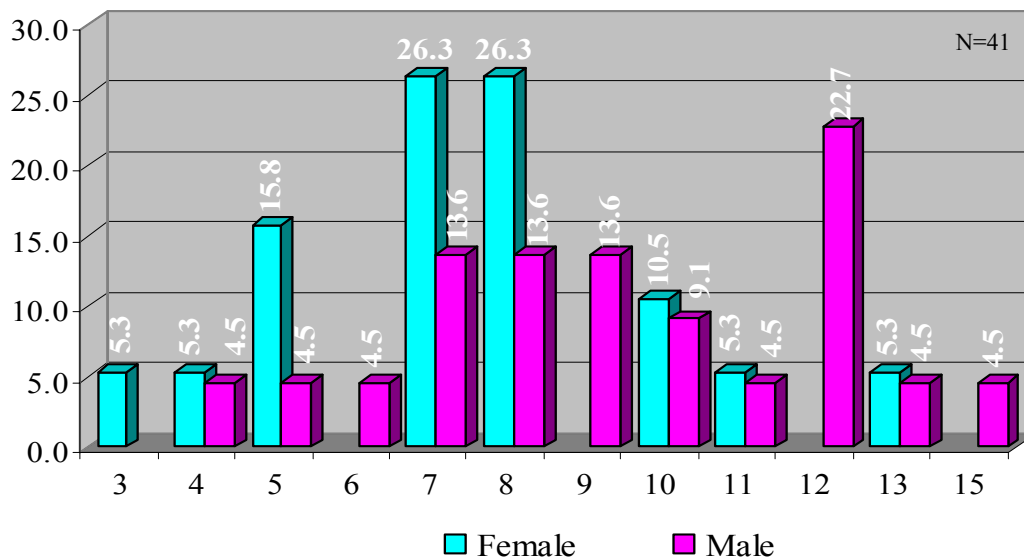


Figure 5.6: Percentage distribution of participants by environmental concern score and gender

Although the levels of environmental concerns differ between the male and female groups in the sample, their pattern of association of environmental concerns with environmental forms is similar (see Appendix 5.7). Environmental concerns for both the samples are primarily associated with factory, landfill, highway/congestion, city, logging, strip mall, sub-division,

wildlife, and agriculture. And, both the samples least associated environmental concerns with arid area, cattle, and manicured lawn followed by wetland, stream, forest, river dam and chicken houses. But, the male sample had a consistently higher percentage of participants volunteering environmental concerns. This is indicative that the environmental concern belief structure for the two is basically similar. However, there is evidence of some difference in the types of environmental degradation and resource use problem/issue themes related to environmental concern. Out of the ANOVA runs on 13 environmental concern-related themes, groups score means for three themes differed significantly at the levels tested (Appendix 5.8). Male sample had a significantly higher score means for complex forms of environmental degradation ($F=4.62$, $p<0.05$), sprawl and growth ($F=3.24$, $p<0.10$), and waste management and recycling ($F=3.15$, $p<0.10$). This finding is in consistent with earlier findings (see Chapter 4) where male sample had significantly higher score means for ecosystem orientation, ecological value, and environmental state orientation. Overall, it is indicative that the male sample has higher levels of ecological knowledge and ecosystem orientation.

Given the test results, especially ANOVA run on environmental concern score mean, it is concluded that the levels of environmental concerns of the male sample differed significantly from the female sample. Although ecofeminist writings show that women are potentially more pro-environmental than their male counterpart (Diamond and Orenstein 1990; Merchant 1979; Stern, et al. 1993), empirical environmental research on gender and environmental concern does not report consistent findings (Hines, et al. 1986/87; Stern, et al. 1993). However, the difference identified in this study can perhaps be ascribed to differences in value orientations between female and male samples. An earlier analysis on gender differences in environmental value orientation in Chapter 4 showed that male respondents had a significantly higher score means

for materialistic values, namely, consumptive and ecological, while female sample had a significantly higher score for aesthetics-oriented values, namely, beauty and psychospiritual. Also, analyses in Chapter 4 found that while score means for ecosystem, environmental state, and ecological value orientations for male sample was significantly higher, the difference in score means for the environmental protection orientation/attitude theme was insignificant. These findings point to the inference that female emphasize protection than expressing concerns, i.e. practical or pragmatic than theoretical or philosophical. However, the significant difference in the score means for the complex forms of environmental degradation theme and overall higher ecological and/or ecosystem orientation for the male sample indicates that ecological knowledge is an important intervening variable in gender differences in environmental concerns.

5.2.4 Age differences in environmental concerns

ANOVA on environmental concern for the three age groups indicate that the groups score means do not differ significantly ($F=0.29$, $p=.747$) (Appendix 5.9). LSD t-test also indicates that there are no statistical differences in the score means between the three groups. Given the test results, the alternative hypothesis H_{A7} of difference in environmental concern as defined by age is rejected. Percentage distribution of the participants by environmental concern category shows a large proportion of participants (above 60%) fell in the low environmental concern category (Figure 5.7), suggesting similarity in their levels of concerns. Also, the three groups are similar in terms of variability of environmental concern scores (Figure 5.8). The environmental concern scores ranged from 3-15 indicative of large variations in the sample. The three age groups primarily associated environmental concerns with factory, highway/congestion, landfill, logging, city, strip mall, and wildlife (see Appendix 5.10). And, the three groups least associated environmental concern with arid area, cattle pasture, stream, and manicured lawn,

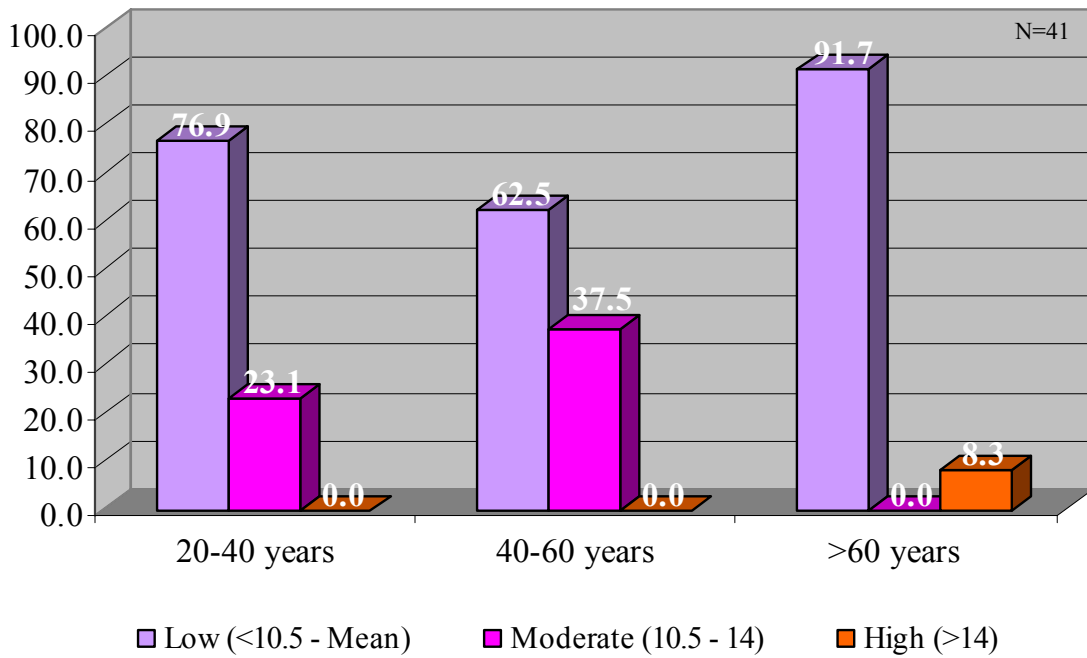


Figure 5.7: Percentage distribution of participants by environmental concern categories and age

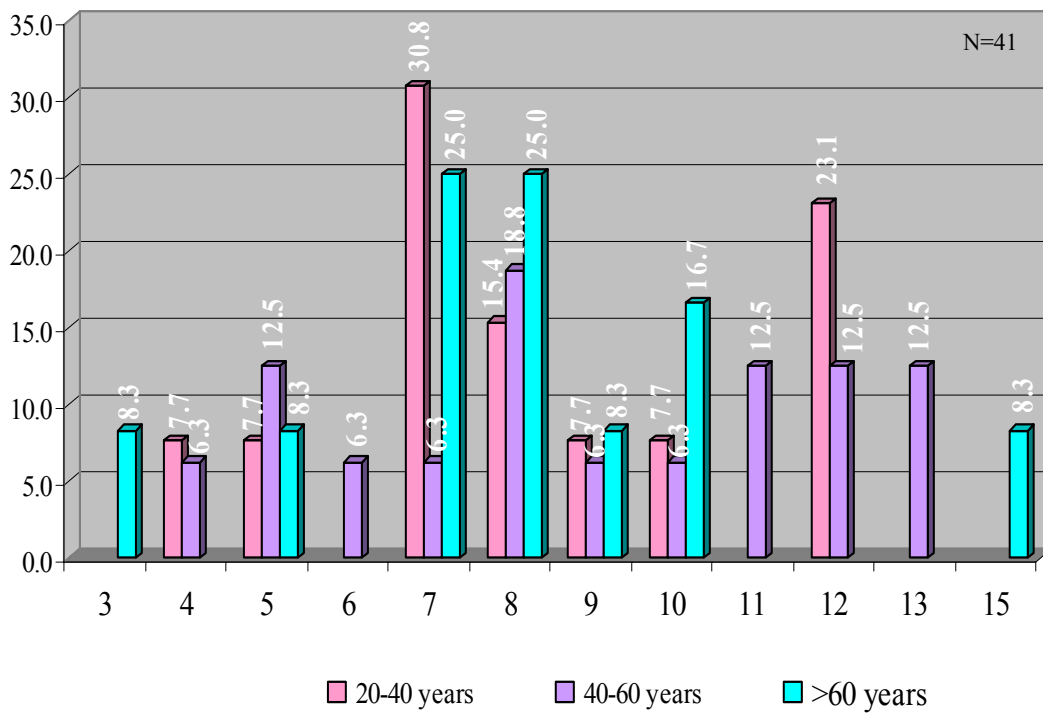


Figure 5.8: Percentage distribution of participants by environmental concern score and age

followed by chicken houses, river dam, forest and wetland. This similarity in association of environmental concern with environmental forms is supportive of the no significant difference in the levels of environmental concern between the three age groups. As regards to the types of environmental degradation and resource use problem/issue themes related to environmental concerns, the groups score means differed significantly only for physical degradation of landscape ($F=2.75$, $p<0.10$) and loss of wildlife and habitat ($F=7.58$, $p<0.05$) (Appendix 5.11). The 20-40 years age group had the highest score means for these two themes. This perhaps is indicative of the aesthetic-related value orientation (ugly and recreational) of the 20-40 years age group (see Chapter 4), for physical degradation of land and loss of wildlife habitat is also associated with aesthetic and recreational use of environment.

Given the ANOVA and cross-tabular analyses results, except for two environmental concern-related themes, overall it is concluded the levels of environmental concerns for the three groups are similar. This finding is of particular interest for age is one socio-demographic variable which is consistently found to be negatively correlated to environmentalism or environmental concern (Hines, et al. 1986/87; Mohai and Twight 1987; Van Liere and Dunlap 1980). A plausible explanation to the insignificant difference finding is the exclusion of ACTV and NM/PF samples from the analysis. However, ANOVA run with the full sample ($N=72$) also resulted insignificant difference in the environmental concern score means (see Appendix 5.12).

Although age was not a significant variable in explaining environmental concern in both the analyses, score mean for the 40-60 years age group has the highest score mean in both the set of samples (see Appendix 5.9 and Appendix 5.12). A perusal of Figure 5.8 and Appendix 5.13 indicate the percentage distribution of score means for 40-60 years age group is multi-modal in both the cases. A significant percentage (40% for $N_{lay}=41$, and >60% for $N_{full}=72$) of the

sample forms the upper percentile or mode of distribution for the age group. A plausible explanation for higher score mean for the 40 to 60 years age group category is that these individuals were growing up and/or coming-of-age in the 1960s and 1970s when the environmental movement was at its peak. Given the 40-60 years age group has higher environmental score mean than 20-40 years and >60 years age groups, it is more *cohort effect* (Mohai and Twight 1987; Nazarea, et al. 1998; Van Liere and Dunlap 1980) than the general conclusion found in most environmental social science literature *age is negatively correlated with environmental concern*. As the 40-60 years age group gets older, the negative relationship thesis will become weaker, and eventually disappear.

5.2.5 Education differences in environmental concerns

Although >UG group has the highest environmental concern score mean (9.5), ANOVA indicate that the difference is statistically insignificant at the levels tested (Appendix 5.14). LSD t-test also indicates the lack of significant difference between the score means for the groups. Given the test results, the alternative hypothesis H_{A7} of difference in the score means as defined by level of education is rejected.

This insignificant difference in score means is also supported by the percentage distribution of participants by concern category and level of education, which are almost identical. Figure 5.9 shows that a high percentage (>72%) of the participants fell in the low concern category for the three education categories. A further in-depth distributional study by environmental score counts show that although the score ranged in between 3 to 15, most participants clustered between 7 and 10 (Figure 5.10). There is similarity in distribution pattern between the three groups, except for >UG which is primarily distributed in the 7-10 modal group

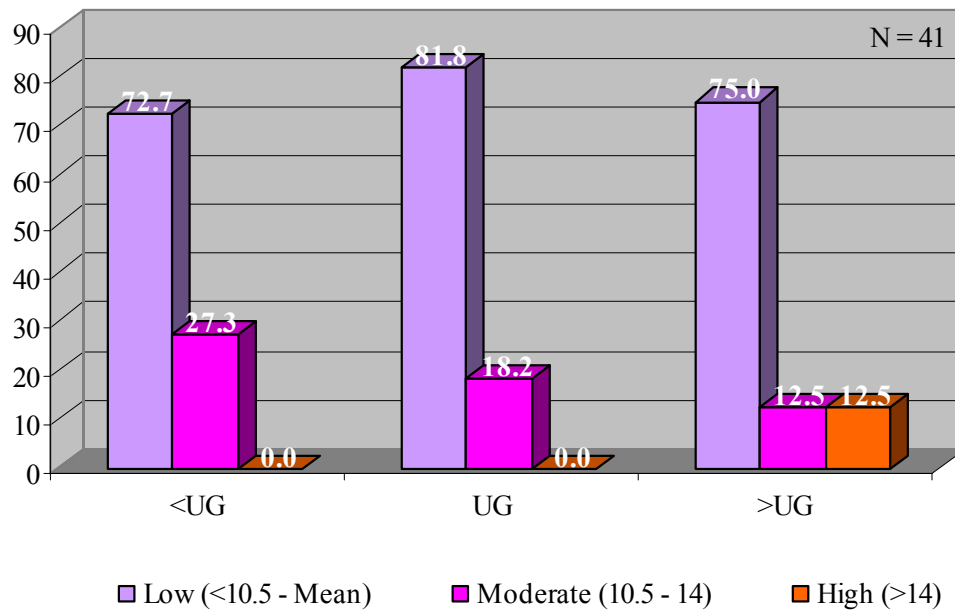


Figure 5.9: Percentage distribution of research participants by environmental concern categories and level of education

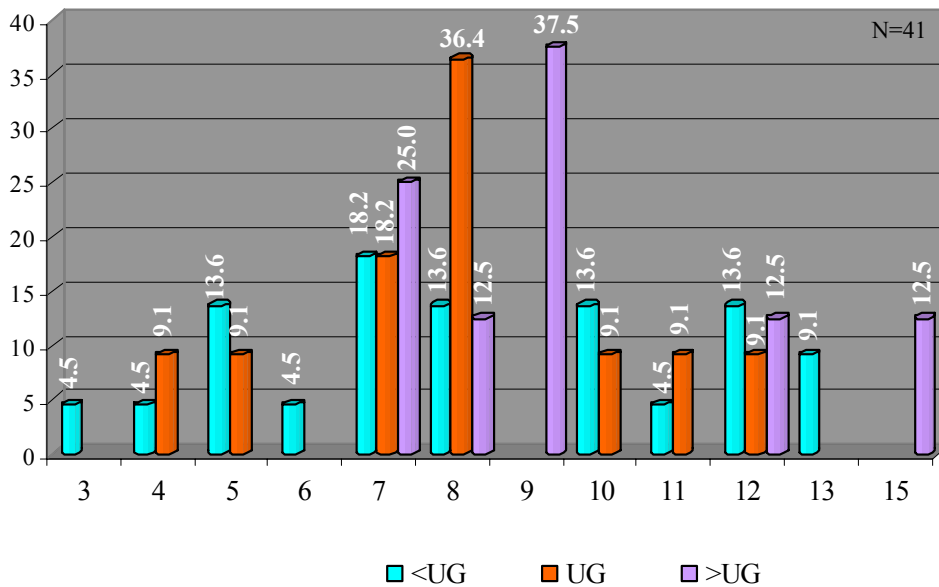


Figure 5.10: Percentage distribution of sample for environmental concern score by level of education

and above. This is indicative that education (though non-scientific) has some role to play in the levels of environmental concern held by a person, though insignificant.

The effect of education level on volunteering environmental concern is also observable in associating environmental concerns with forms of environment. Appendix 5.15 reveals that the pattern of association of environmental concerns with forms of environment is similar with an exception of observable difference in case of cattle pasture and stream. The three education groups primarily associated environmental concerns with factory, logging, city, highway, landfill, strip mall, wild life, and subdivision. They least associated concern with arid area followed by manicured lawn, forest, river dam, chicken houses and wetland. This pattern of association of concern with forms of environment is in agreement with earlier findings with other categories of participants as defined by ethnicity, gender, and age. However, the >UG category has a higher percentage of participants associating environmental concern with cattle pasture (50%) and stream (50%) (Appendix 5.15). As mentioned earlier, environmental degradation and/or pollution in these scenes are not visually obvious unless backed by textbook or scientific knowledge. Given, this difference it can be inferred that level of education has some effect on environmental concern held by participants, though insignificant.

The environmental concern-related themes volunteered by these three groups are also largely similar. ANOVA run on thirteen environmental concern-related themes indicated only three themes have significantly different groups score means. The themes are sprawl and growth ($F=4.74$, $p<0.05$), excessive use of resource ($F=5.47$, $p<0.01$), and efficient/less use of resource ($F=3.07$, $p<0.10$) (see Appendix 5.16). Higher scores means for these themes are associated with UG and >UG categories. While UG had the highest score mean for excessive use of resources (1.55), >UG had the highest score means for sprawl/growth (1.13) and efficient/less use of

resources (1.13). These results also indicate education has some role to play in explaining environmental concern in the sample.

Given the test results, overall, it is concluded that level of education had insignificant effect on the levels of environmental concerns. This finding is contrary to expectation as per social class hypothesis as measured by income, education and occupational prestige (Buttell and Flinn 1978; Van Liere and Dunlap 1980). However, given the findings, it can be inferred that education can to some extent explain differences in the environmental concerns, though statistically insignificant.

5.3 Reasons for Environmental Concerns

In the semi-structured ethnographic interviews the research participants were asked if they are concerned about the environment or not. If yes, they were asked to give reasons for their environmental concern and protection. The following findings are based on the analysis of the reasons volunteered by the participants. Since the research participants generally gave more than one reason for their concerns, the total responses were 155, though the number of participants responding was only sixty four.

The 155 reasons volunteered by research participants were coded into 10 categories, which are presented in Figure 5.11. A perusal of the figure reveals that the reasons *clean and healthy living*, and *survival/future generations* are the two primary reasons, which accounted for 55 percent of the total reasons given by the participants. These two reasons are anthropocentric, however ecological. The third most cited reason *most rational/responsible thing to do* is pragmatic and intellectual, which is also anthropocentric and ecological. Given these reasons, the primary environmental ethics may be called *utilitarian-conservationism* or *ecological-anthropocentrism* which is in conformation to the environmental protection orientation elicited

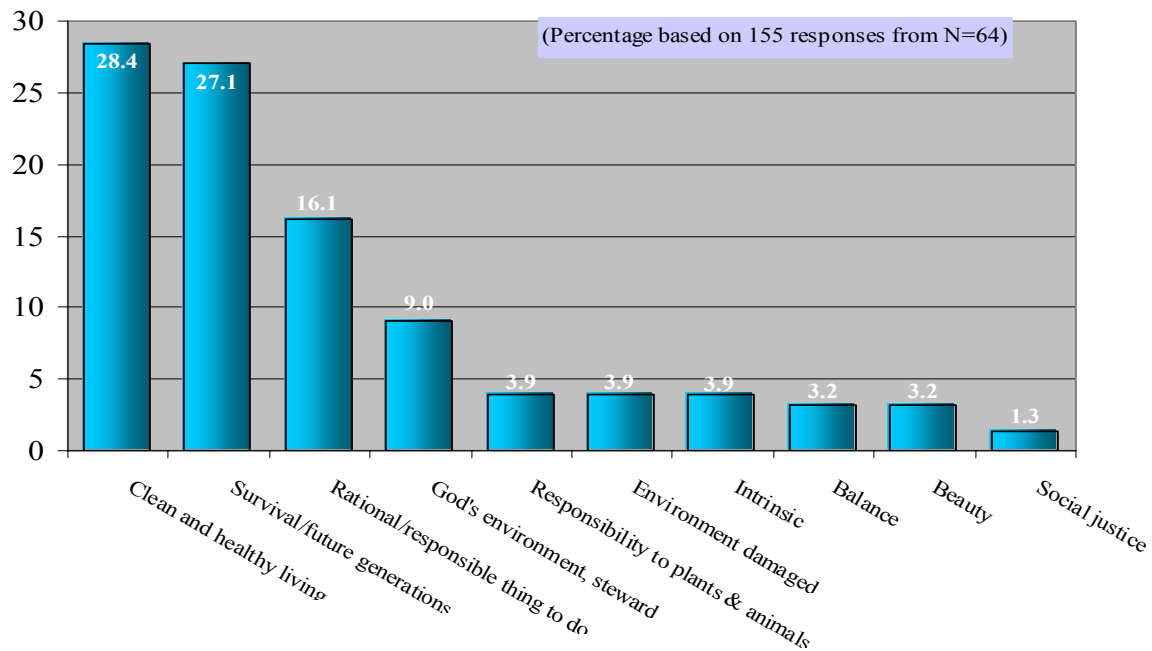


Figure 5.11: Percentage distribution of reasons for environmental concerns

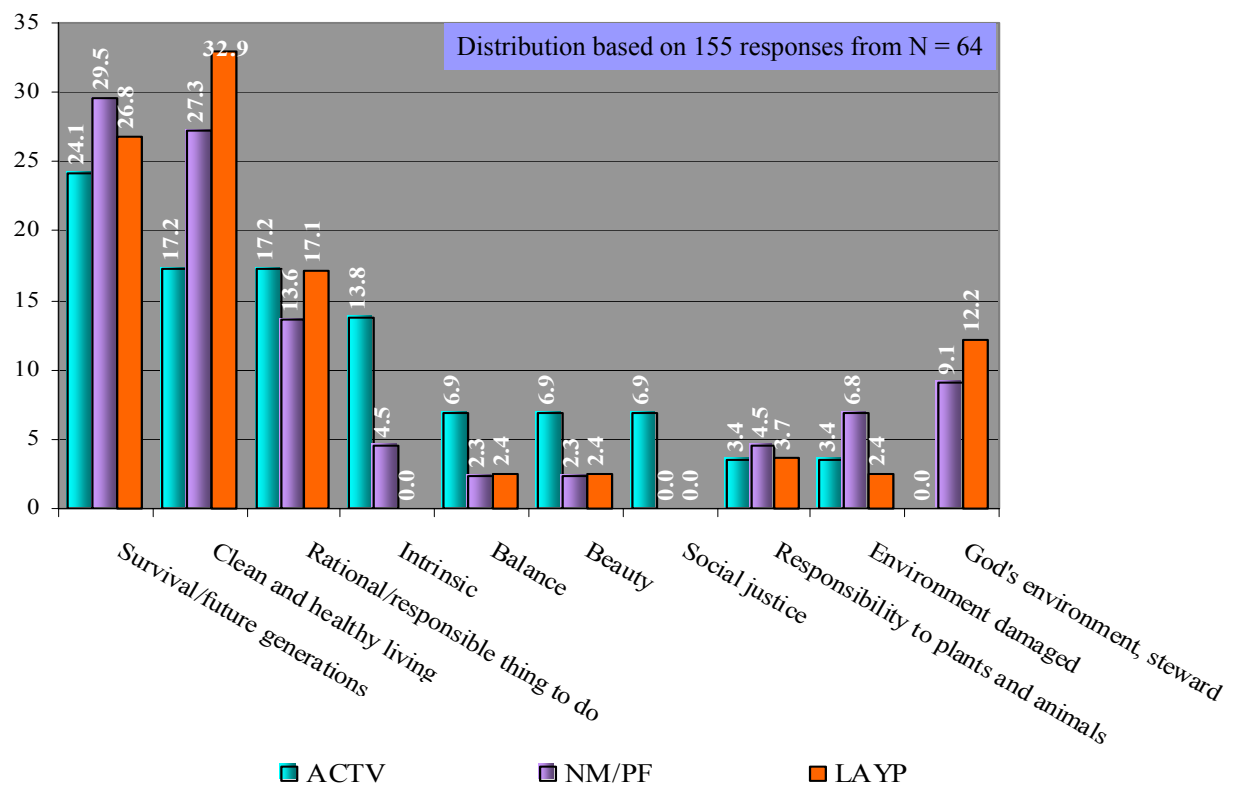


Figure 5.12: Percentage distribution for reasons for environmental concerns by level of activism

during MTAT session. Interestingly, following these three themes is the religious basis for environmental concern. They reported that the earth and environment are God's creation. It belongs to God and is a gift to us. Therefore, it is our responsibility to take care of the environment as good stewards. This basis is also in conformation to ethical basis given by participants for environmental protection during the MTAT session. The other minor reasons for environmental concerns are responsibility to plants and animals, environmental degradation, intrinsic value, beauty, balance, and social justice, which also reflect the other ethical codes volunteered by participants during the MTAT session. However, interesting is the low percentage for beauty given beauty is identified an important value in the sample (see Chapter 4). A plausible reason is that the participants compartmentalize consumptive-utilitarian and ecological values from aesthetics, or aesthetic is treated a subset of overall environmental concern and quality issues.

Percentage distribution of reasons for environmental concerns by level of activism is presented in Figure 5.12. A study of the figure shows that the primary reasons for the three groups are similar, namely, survival/future generations, clean and healthy living, and rational/responsible thing to do, though there are variations in their percentage scores. However they differ in terms of intrinsic, religious, and social justice. While ACTV and NM/PF invoked intrinsic worth of environment, LAYP and NM/PF invoked religion as basis for protection of environment and environmental concerns raised.

Noteworthy, although only 2.4% of the LAYP sample volunteered *sustainability* a resource use problem or issue in the MTAT session (see Appendix 5.2), 26.8% of LAYP volunteered *survival/future generations* reason for environmental concern (see Figure 5.12). Their expression for human survival and future generations may be interpreted a form of

sustainability, however with a different perspective. While ACTV and NM/PF are holistic, anthropocentric, non-anthropocentric, and impersonal, LAYP are primarily anthropocentric and personal at times. The six sample quotes presented below demonstrate the difference in their concept of concern for survival and future generation. The first quote is from a young activist environmentalist. His views are anthropocentric, but at the same time links ecological sustainability and social justice. The second is also from a middle-aged male activist environmentalist. His views are biocentric based upon deep ecology philosophy. To him the health of the environment is primary, which eventually is good for human health. The third quote is from a middle-aged female and a non-active member of environmental organization. The quote is communalistic. Human concern is there, but does not necessarily precede environment. The remaining three quotes are from LAYP. The first is from an older black female, the second from middle-aged white male, and the final from a young black male. Their concerns are primarily anthropocentric with tints of kin-centered concerns.

I would say that there's a symbiotic relationship between social justice and ecological sustainability and the only way we're going to have a more socially just society is one in which we have better protections for the environment. I believe the two go hand in hand...it's not just about parks and having pretty green spaces or saving the whales, it's about best practices in agriculture, it's about distribution of the world's resources, it's about us decreasing our consumption, partly in order to help with development in Asia and Africa, it's about cheap tennis shoes because we exploit people and because we dump the rubber and chemicals into the environment. It's a symbiotic relationship.

Participant - A/Env/WM/1

The most important reason comes from deep ecology. The standpoint is the environment has a right, as much as any one regular part of the environment, to exist. That is philosophical and important for me. From a pragmatic reason, we have got to make sure that the environment is healthy and the bio-diversity is maintained, the environment is clean and functioning for the long term survival of the human race. But I think, first, you have to understand that the environment needs to be preserved for its own sake and then secondarily that is also going to benefit the humans.

Participant - A/Env/WM/2

When we lose pieces of our natural environment, we lose habitat for plants and animals. We are part of that population. We lose resources. As we use the resources, we should be starting to renew them. We should use them in a responsible way. If we lose our natural environment, not only will the wildlife

animals be dead but the human animals will be dead, too. We live off of our earth.

Participant - P/WF/40-60yrs/1

I guess when you think about the future and if we use it all up now, or overuse it at this point, what will things be like in the future?...we have a responsibility to conserve and preserve as much as possible for our future generations.

Participant - L/BF/>60yrs/2

Why am I concerned? For my children and my grandchildren. I just pray that we can leave this earth in as good a shape or better shape than it was when I've been alive.

Participant - L/WM/40-60yrs/2

I just think we don't take care of [environment] a lot of times. By us not taking care of the environment we're not hurting the environment, we're more so hurting ourselves...So you've got to think about what damage I'm making to the environment now, and to my great grandchildren and their great grandchildren. What affect is that going to have on my descendants?

Participant - L/BM/<40yrs/4

Although there are some differences in reasons for environmental concern in between ACTV, NM/PF and LAYP, differences in ethnicity, gender, age and education has little effect on the reasons volunteered by the LAYP sample. Following is the results and findings of percentage distributional analysis of reasons for environmental concerns by ethnicity, gender, age, and education. The distribution is based upon 82 reasons volunteered by 39 laypersons. Percentage distribution of reasons for environmental concerns by ethnicity, gender, age, and education are presented in Figure 5.13, Figure 5.14, Figure 5.15, and Figure 5.16, respectively. Study of the figures show that clean and healthy living, for survival/future generations, rational/responsible thing to do, and God's environment/gift are the four primary reasons volunteered by the research participants of all categories. Thus it is concluded that the reasons volunteered by LAYP for their environmental concerns are similar, where besides the three ecological-anthropocentric reasons, religion is the fourth important basis volunteered.

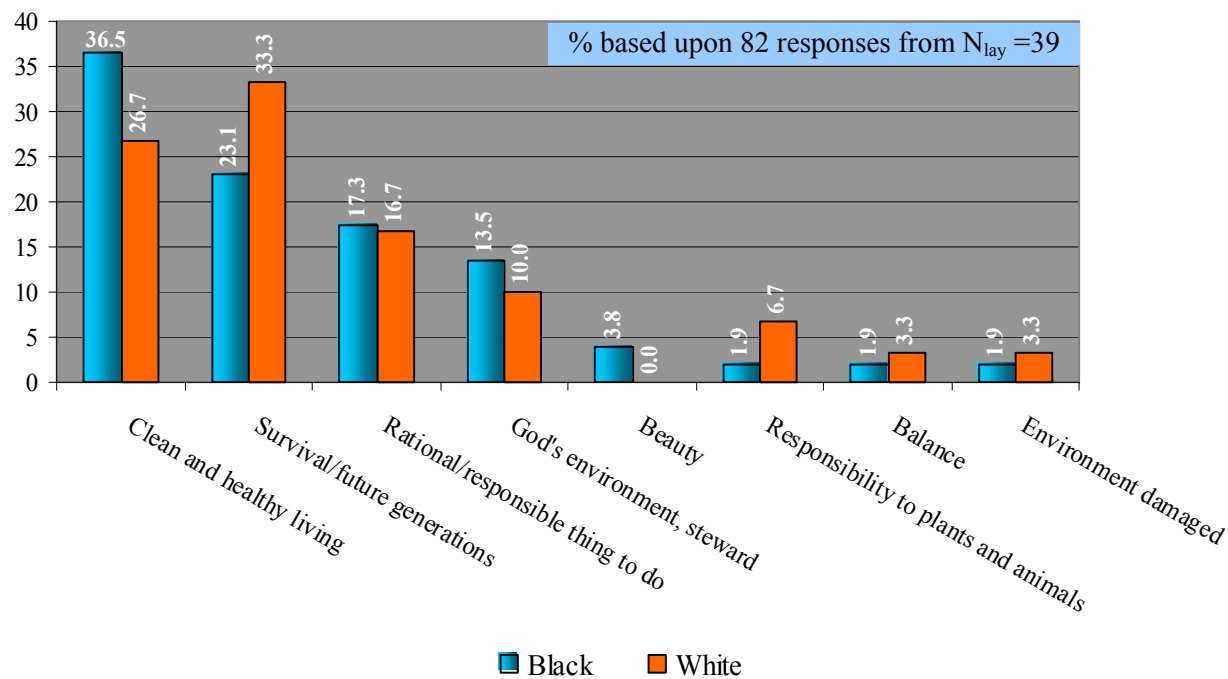


Figure 5.13: Percentage distribution of reasons for environmental concern by ethnicity

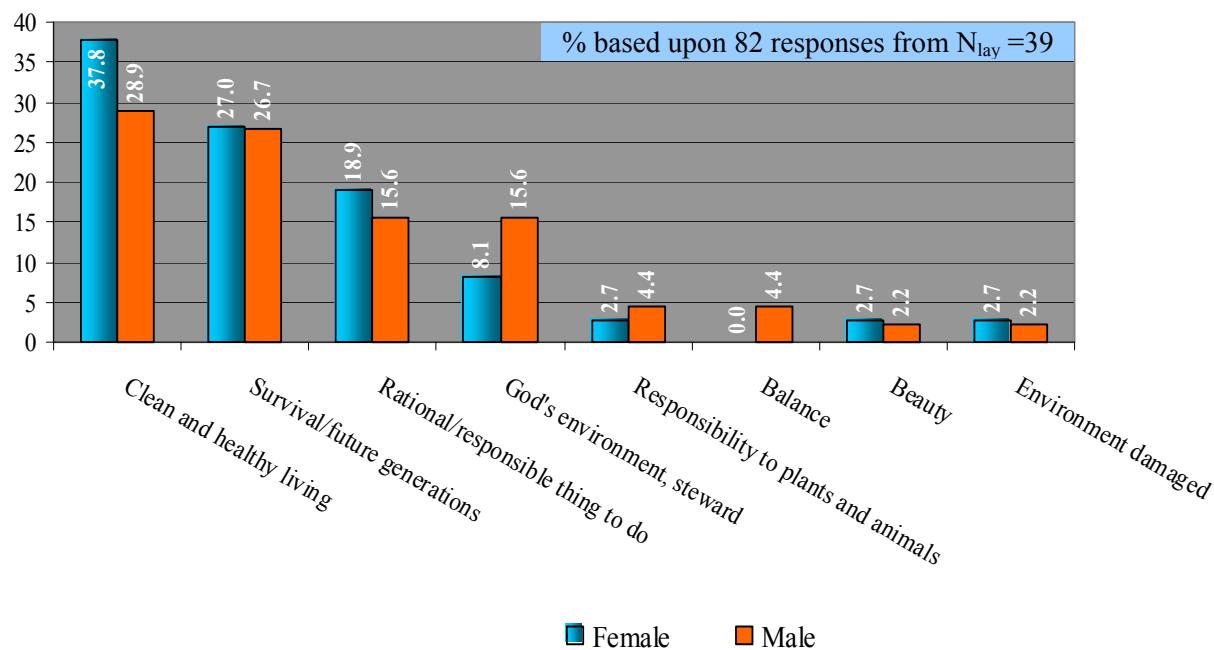


Figure 5.14: Percentage distribution of reasons for environmental concern by gender

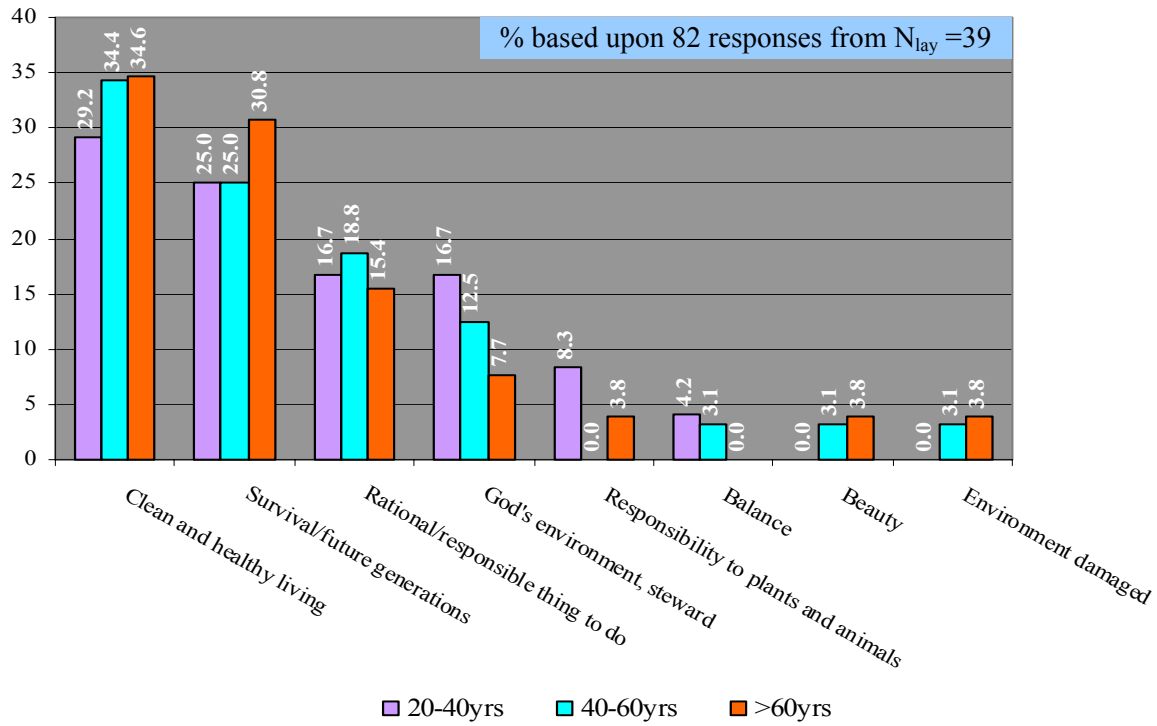


Figure 5.15: Percentage distribution of reasons for environmental concerns by age

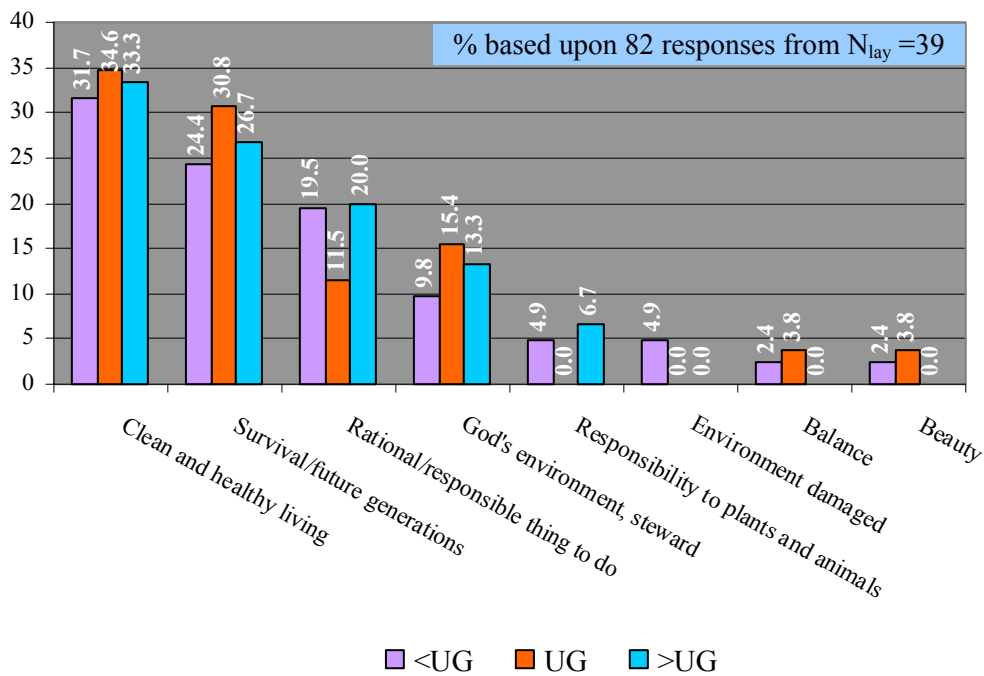


Figure 5.16: Percentage distribution of reasons of environmental concerns by education

5.4 Summary and Conclusion

Chapter 5 dealt with studying the environmental concerns in the sample. The objective was to study the levels of environmental concerns and identify the socio-cultural correlates that explain the variance. The alternative hypothesis H_{A7} was broadly defined to test variability in environmental concern in the sample is a function of level of activism, ethnicity, gender, age, and education. Differences in environmental concern by level of activism used the full sample ($N_{full}=72$), while differences in concern by ethnicity, gender, age and education used layperson sample ($N_{lay}=41$). The data for hypothesis testing were derived from the MTAT. ANOVA, LSD t-test, and cross-tabular analysis were performed to study the data.

Hypothesis testing on environmental concern by level of activism indicated a significant difference in the groups score means. ACTV showed the highest level of environmental concern followed by NM/PF and LAYP. Thus the H_{A7} of difference in the groups score means by level of activism was accepted. LSD t-test indicated that the score means differed significantly between the three groups. The hypothesis test result was supported by differences in the cross-distribution of research participants by environmental concern category and level of activism; association of environmental concern with environmental forms; and results of ANOVA runs on environmental concern-related themes invoked by participants. ACTV and NM/PF associated environmental concerns with all forms of environment. However, LAYP primarily associated environmental concerns with environmental forms with visual cues of environmental degradation or pollution, for example, factory, highway, logging, landfill, city, and strip mall. LAYP least associated environmental concern with benign looking environmental forms like arid area, cattle pasture, chicken houses, manicured lawn, and stream, in which environmental degradation are visually less obvious as compared to factory, landfill, highway congestion, and city. This is indicative knowledge is an important intervening variable in discerning environmental

degradation; thus environmental concern. ANOVA runs on 13 environmental concern-related themes indicated score means for three themes—simple forms of environmental degradation, efficient use of resources, and population growth—did not differ significantly between the groups, while the score means differed significantly for the remaining ten themes. This suggests that LAYP environmental concerns do not differ from ACTV and NM/PF primarily in terms of simple forms of environmental degradation themes, indicative that ecological knowledge is an important intervening variable differentiating LAYP, NM/PF and ACTV environmental concerns.

The second hypothesis testing on ethnic (black vs. white) differences in environmental concern indicated no significant difference; thus the alternative hypothesis of difference was rejected. This result was supported by similarity in the cross-distribution of participants by environmental concern category and ethnicity variable, and similarity in association of environmental concern with environmental forms. ANOVA runs on 13 environmental concern-related themes indicated significant difference in only two themes, viz., excessive use and wasteful. White sample had a higher score means for these two themes. However, overall, the levels of environmental concern for the black and white samples are similar. Although recent studies show similar or higher levels of environmental concern for black as compared to white (Mohai 1990; Mohai and Bryant 1992); this finding is particularly interesting in the light that traditionally blacks are rated environmentally less concerned than white population in social science environmental research/study literature (Taylor 1989; Taylor 2000).

Hypothesis testing on gender differences in environmental concern indicated difference in the groups score means. Male sample had a significantly higher environmental concern score mean than female sample. This finding is contrary to ecofeminist theory (Diamond and Orenstein

1990; Merchant 1979), though literature indicate mixed results on gender differences and environmentalism (Hines, et al. 1986/87; Stern, et al. 1993). The difference in the score mean was also reflected in the cross-distribution of the sample by environmental concern category and gender. About 90% of the female participants fell in the low concern category, while only 64% of the male sample fell in the same category. Although, the pattern of association of environmental concern with environmental forms was similar, male had a consistently higher percentage score. ANOVA run on the 13 environmental concern-related themes indicated male sample to have a significantly higher score means for a) complex forms of environmental degradation, b) sprawl and growth, and c) waste management and recycling themes. This is suggestive ecological/ecosystem knowledge is important intervening variable in discerning the differences between male and female samples.

Contrary to theorization of strong inverse relationship between age and environmentalism (Buttelt 1979; Van Liere and Dunlap 1980), hypothesis testing on age differences in environmental concerns indicated no significant difference between the groups score means; thus the hypothesis of difference was rejected. Although insignificant, score mean for 40-60 years had the highest score mean (8.88) followed by 20-40 years (8.31) and >60 years (8.08). This pattern/difference is also reflected in the cross-distribution of participants by environmental concern categories and age groups, association of environmental concern and environmental forms, and ANOVA run on environmental concern-related themes. A high percentage (91%) of >60 years age group fell in the low concern category, as compared to 20-40 years (76%) and 40-60 years age (62.5%) groups. Although age group 40-60 years had a higher environmental concern score mean, overall, the pattern of association of environmental concern and environmental forms for the three groups were similar. ANOVA runs on the 13 environmental

concern-related themes, only two themes emerged significant. These are suggestive that some minor differences exist. However, given the social science literature consistently found age to be negatively related to environmental concern, the finding of no difference is particularly interesting. The 40-60 years age group, who were growing or coming-of-age during the 1970s, has the highest score mean. Perhaps this is indicative of cohort effect (Mohai and Twight 1987; Nazarea 1999; Van Liere and Dunlap 1980) than the negative relationship generalization. As the cohort coming-of-age during the 1970s gets older the negative relationship thesis will become increasingly weaker.

The final hypothesis testing for difference in the levels of environmental concern as a function of education was performed. The test resulted insignificant difference in the groups score means as defined by education; thus the alternative hypothesis of difference was rejected. The percentage distribution of participants by environmental concern category and level of education was almost identical, supportive of the non-significant difference finding. Similarly, a study of association of environmental concern with environmental forms revealed a similar pattern except for stream and cattle pasture. A higher percentage of >UG group associated environmental concern with stream and cattle pasture, indicative of some form of education effect though insignificant. ANOVA run on the 13 environmental concern-related themes suggest that score means for sprawl/growth, excessive use, and efficient use of resources themes differed significantly. The UG and >UG groups have consistently higher score means than <UG. This is, again, suggestive that education has some effect on levels of environmental concern. However, given the hypothesis test results, the effect is statistically insignificant. This result is interesting for in social science literature education, as a part of social class hypothesis, is expected to have a significant positive effect on the levels of environmental concerns (Dietz, et

al. 1998; Jones and Dunlap 1992; Van Liere and Dunlap 1980). Although insignificant, it is suggestive that education has some effect on levels of environmental concern in the sample.

Finally, a study into the reasons for environmental concerns was performed. Overall, the primary reasons for environmental concerns were clean and healthy living, survival/future generations, rational/responsible thing to do, and it is God's environment. The first three are anthropocentric or utilitarian in nature. Given its ecological basis, though anthropocentric, it may be termed *utilitarian-conservationism*, or *ecological-anthropocentrism/utilitarianism*.

Interestingly, the religious basis emerged as the fourth important reason, which conformed to the religious basis of value and ethics in the sample elicited from the MTAT. The religious basis was primarily carried by LAYP and NM/PF samples.

Given the analytical results, it is concluded that the sample is environmentally concerned in one form or the other. Important is the differences in the environmental concerns between LAYP, NM/PF and ACTV. While LAYP concerns are primarily based on simple forms of environmental degradations, NM/PF and ACTV concerns are based on much broader and deeper understanding of the modern ecological problems. This finding has the implication that percentages reported in opinion polls and research on public environmental concerns need to be appropriately interpreted for there exist a gradation in the levels of concern as defined by ecological knowledge held and the forms of environmental degradations (simple and complex).

Based upon hypothesis testing results, it is concluded level of activism and gender are the variables that have significant explanatory power in explaining the differences in the levels of environmental concern. As opposed to ecofeminist writings, males are environmentally more concerned than females. Similarly, contrary to theorizations in social science on environmentalism, ethnicity, age, and level of education variables are non-significant in

explaining variance in environmental concern in the LAYP sample. Clean and healthy living, for survival/future generations, and rational/responsible thing to do are the primary reasons for their environmental concerns, which are ecologically-anthropocentric. Interestingly, contrary to the popular thesis *Christianity the root of ecological crisis*, religion emerged the fourth important reason for environmental concerns, which is primarily carried by LAYP and NM/PF participants.

CHAPTER 6: ENVIRONMENTAL BEHAVIORS

6.1 Introduction

With five percent of the world population, United States is the largest per capita consumer of earthly resources using twenty-five percent of the world's oil, producing annually more than half a ton of garbage while discarding one tire for every man, woman and child (Appenzeller 2004; Clarke and Cortner 2001; Steinberg 2002). Given American culture and its level of consumerism, the objective of this chapter is to analyze the reported pro-environmental behaviors in the sample, and identify what socio-cultural correlates are important in explaining them. The primary goal of the chapter is to test alternative hypothesis H_A7 "variability in the reported pro-environmental behaviors is a function of level of activism, ethnicity, gender, age, education, and environmental concern." First, results of the general distributional study on the types of reported behaviors are presented. Second, the results of hypothesis testing to compare environmental behavior score means by level of activism, ethnicity, gender, age, and education are presented. Finally, results of the bivariate correlation study between environmental concerns and behaviors are presented.

The field of social science research on environmental concern and attitude is consistent, and has made progress in identifying its correlates. However, research on pro-environmental behavior is much less consistent, especially research on the types of behaviors and their correlates. Recycling is the only field that has been thoroughly examined (Hallin 1995; Olli, et al. 2001). Other examples include research on voting intentions, gasoline use, meta-analysis, and use of multiple behavioral items to study pro-environmental behaviors (Hallin 1995; Hines, et

al. 1986/87; Kaiser, et al. 1999; Karp 1996; Vaske and Donnelly 1999). They have used sociodemographics, attitudes, personal norms, values, past behavior, efficacy factors and locus of control in various combinations as independent variables to explain pro-environmental behaviors (Corraliza and Berenguer 2000; Hallin 1995; Hamid and Cheng 1995; Hines, et al. 1986/87; Sivek and Hungerford 1989/90; Vogel 1996). However, all except Hallin (1995) used the questionnaire survey method to study pro-environmental behaviors. Hallin (1995) used a combination of ethnographic interview and questionnaire survey to study recycling in Foley, Minnesota. This dissertation research used semi-structured ethnographic interview methods to get better insights, which is difficult to obtain with questionnaire method for they are primarily close ended. Additionally, very few environmental behavior studies have tried to link concerns with behavior, although they have tried to correlate behavior with other independent variables. The few available studies on environmental behaviors point to a weak relationship between concerns and behavior (Axelrod and Lehman 1993; Dunlap 1991; Kempton, et al. 1995; O'Riordan 1976). Thus, an objective of the chapter is also to study correlation between the levels of concerns expressed and levels of pro-environmental behaviors adopted.

The data for the study are derived from the semistructured ethnographic interview component of the research. Following the question on environmental concern, the participants were asked about pro-environmental behaviors adopted. Simple cross-tables, correlation, and ANOVA are used to analyze the data. ANOVA in particular is used to test the hypothesis, while cross-tables and bivariate correlation are used to study other forms of correlation between the independent and dependent variables, and to support ANOVA results and findings. Each reported behavior was scored one. Based upon the total score count of reported behaviors, a new behavioral variable was derived. ANOVA was run on the derived variable to compare the groups

score means as defined by level of activism, ethnicity, gender, age, and education to test the alternative hypothesis of difference. Hypothesis was tested at three levels of significance: $\alpha=0.01$, $\alpha=0.01$, and $\alpha=0.10$. ANOVA to compare score mean by level activism was run on the full sample ($N_{full}=67$), and ANOVA to compare score mean by ethnicity, gender, age and education was run on only layperson sample ($N_{lay}=39$). For independent variables with three categories (level of activism, age and education), ANOVA was complemented with LSD t-test. Correlation between environmental concern and behavior was studied with cross-table analysis and Pearson correlation coefficient (Bhattacharyya and Johnson 1977; Norusis 2000). Two analyses, one with full sample ($N_{full}=67$) and one with layperson sample ($N_{lay}=39$) are run to study the relationship. Environmental behavior distribution was studied by categorizing reported environmental behaviors into three categories: low, moderate, and high pro-environmental behaviors. Since no measuring yard stick is available, these categories are derived based upon the sample mean (4.51), and the maximum and minimum scores. Environmental behavior scores below the mean (4.51) were categorized low, score between 4.6 and 7 were categorized moderate, and scores >7 were categorized high.

6.2 Types and Distribution of Self-Reported Environmental Behaviors

The types of pro-environmental behavior reported by research participants during the ethnographic interviews are presented in this section. The analysis is based upon 308 reported behaviors by 67 research participants: ACTV – 11; NM/PF -17, and LAYP - 39. The reported 308 behaviors were coded into 37 categories. The generalized distribution of the behaviors is presented in Figure 6.1.

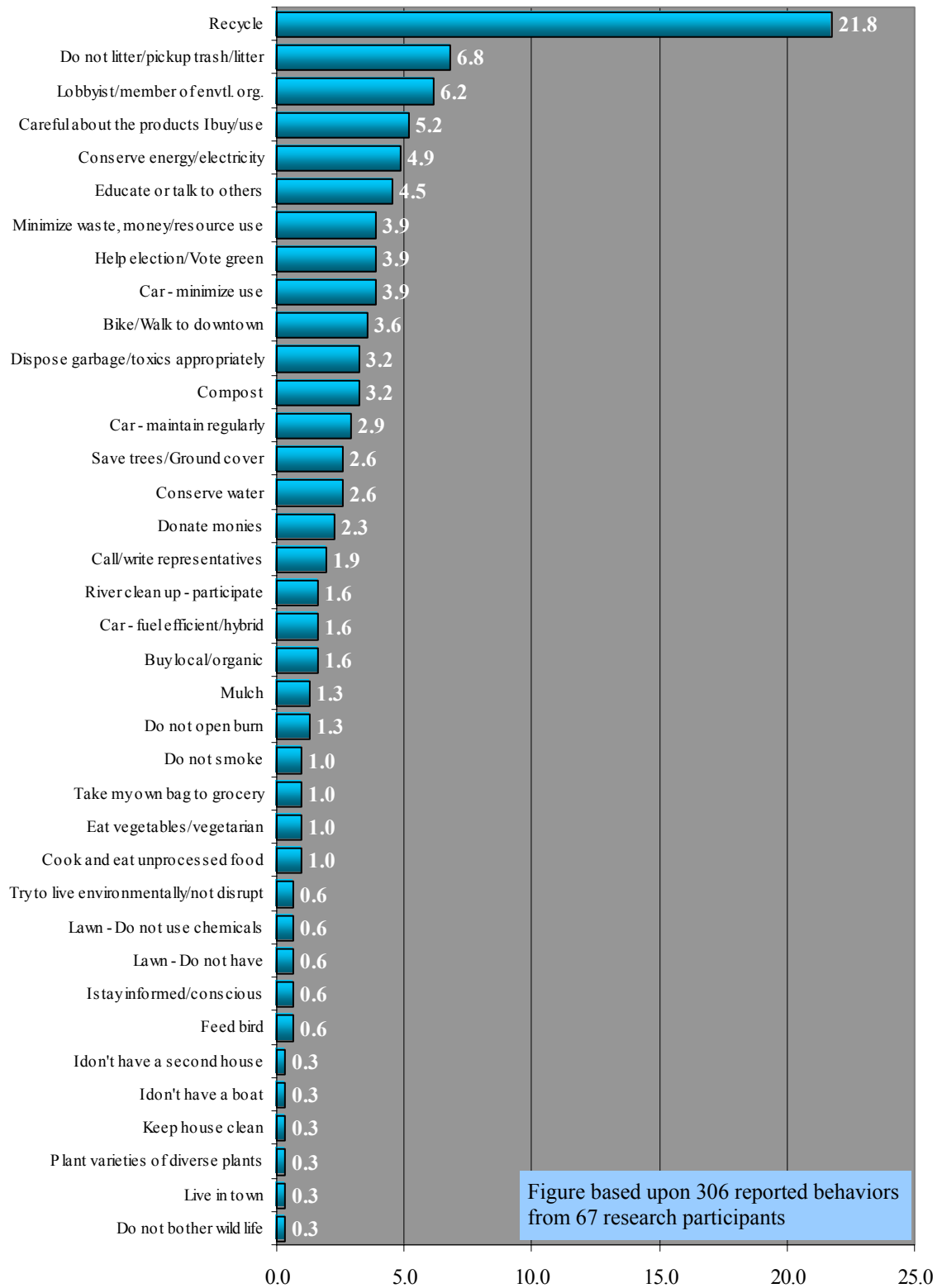


Figure 6.1: Percentage distribution of reported pro-environmental behaviors

A perusal of Figure 6.1 shows that *recycling* is the most reported behavior. It accounted for 21.8 percent of the total reported 308 behaviors. Of the 67 respondents, 65 (97.0%) reported they recycled. Noteworthy is the *do not litter/pickup trash/litter* at a distant second at 6.8 percent. The third most reported pro-environmental behavior is *lobbyist/member of environmental organization*, which is primarily comprised of ACTV and NM/PF participants. Interesting finding is that, except for recycling, the percentage points for most behaviors are very small. This is indicative that there is no set of actions/behaviors that most participants practice, as a form of culture, in response to the environmental concerns they express. The pro-environmental behaviors adopted/reported seem more random than systemic. This is reflected in some of the behaviors reported by participants; for example, I do not smoke, keep house clean, do not open burn, I do not have a boat, I do not have a second house, I do not bother wildlife, and feed birds⁹, among others.

6.3 Pro-environmental Behaviors and its Correlates - Results of Hypothesis Testing

This section presents the results of hypothesis testing to study the difference in the reported pro-environmental behaviors of participants by level of activism, ethnicity, gender, age, and education. Also, results of correlation study between environmental concern and behaviors are presented.

6.3.1 Level of activism and pro-environmental behaviors

ACTV had the highest pro-environmental behavior score mean of 7.91, followed by NM/PF (5.41), and LAYP (3.15). ANOVA run to compare the groups score means indicated a statistically significant difference in their score means at the levels tested ($F=35.06$, $p<0.000$)

⁹ Local ordinance prohibits open burning. Many persons may dismiss many of these behaviors as pro-environmental, though it may be valid, for example, a person with resources consciously not buying a second house for environmental reasons.

(see Appendix 6.1). LSD t-test results also indicated that the groups score means between the three groups differed significantly. Given the test results, the alternative hypothesis H_{A7} of difference in the groups score means is accepted.

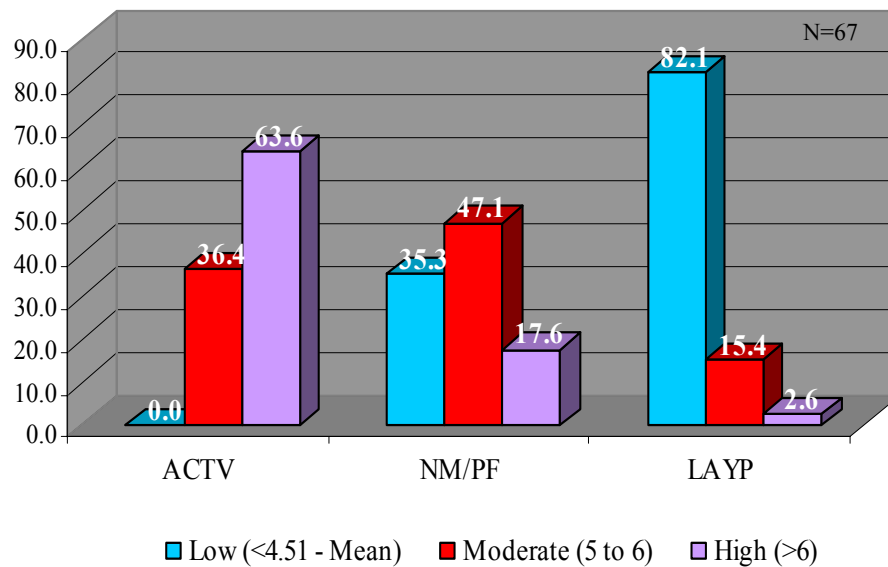


Figure 6.2: Percentage distribution of research participants by behavioral category and level of activism

Percentage distribution of research participants by behavior category and level of activism is presented in Figure 6.2. The distribution in Figure 6.2 shows that about 64% of the ACTV fell in the high pro-environmental behavior category. Contrary to this, 17.6% of NM/PF and 2.6% of the LAYP fell in the same category, respectively. The distribution shows that while the percentage of NM/PF participants in the low (35.4%) and moderate (47.1%) categories is close, the distribution for LAYP is skewed to the low category (82.1%).

Lobbying (14.6%) is the primary pro-environmental behavior reported by ACTV, a public sphere behavior (Table 6.1). Of the total behaviors reported by ACTV, 33.7% of them comprised public sphere behaviors (Figure 6.3). Recycling (12.4%), voting/helping green

Table 6.1: Percentage distribution of reported pro-environmental behaviors by level activism

Sl	Category	ACTV	NM/PF	LAYP	Total	Behavior sphere
1	Recycle	12.4	20.2	29.6	21.8	Private sphere
2	Do not litter/pickup trash/litter	1.1	3.2	13.6	6.8	Private sphere
3	Careful about the products I buy/use	6.7	6.4	3.2	5.2	Private sphere
4	Conserve energy/electricity	6.7	6.4	2.4	4.9	Private sphere
5	Car - minimize use	3.4	4.3	4.0	3.9	Private sphere
6	Minimize waste, money/resource use	4.5	2.1	4.8	3.9	Private sphere
7	Bike/Walk to downtown	5.6	5.3	0.8	3.6	Private sphere
8	Compost	2.2	5.3	2.4	3.2	Private sphere
9	Dispose garbage/toxics appropriately		1.1	7.2	3.2	Private sphere
10	Car - maintain regularly		1.1	6.4	2.9	Private sphere
11	Conserve water	2.2	2.1	3.2	2.6	Private sphere
12	Save trees/Ground cover		2.1	4.8	2.6	Private sphere
13	Buy local/organic	4.5		0.8	1.6	Private sphere
14	Car - fuel efficient/hybrid	3.4	1.1	0.8	1.6	Private sphere
15	Do not open burn		1.1	2.4	1.3	Private sphere
16	Mulch	2.2	2.1		1.3	Private sphere
17	Cook and eat unprocessed food		3.2		1.0	Private sphere
18	Eat vegetables/vegetarian	2.2	1.1		1.0	Private sphere
19	Take my own bag to grocery	1.1		1.6	1.0	Private sphere
20	Do not smoke			2.4	1.0	Private sphere
21	Feed bird		1.1	0.8	0.6	Private sphere
22	I stay informed/conscious		2.1		0.6	Private sphere
23	Lawn - Do not have	2.2			0.6	Private sphere
24	Lawn - Do not use chemicals	1.1		0.8	0.6	Private sphere
25	Try to live environmentally/not disrupt	1.1		0.8	0.6	Private sphere
26	Do not bother wild life			0.8	0.3	Private sphere
27	Live in town		1.1		0.3	Private sphere
28	Plant varieties of diverse plants		1.1		0.3	Private sphere
29	Keep house clean			0.8	0.3	Private sphere
30	I don't have a boat	1.1			0.3	Private sphere
31	I don't have a second house	1.1			0.3	Private sphere
32	Lobbyist/member of envtl. org.	14.6	3.2	2.4	6.2	Public sphere
33	Educate or talk to others	4.5	7.4	2.4	4.5	Public sphere
34	Help election/Vote green	9.0	3.2	0.8	3.9	Public sphere
35	Donate monies	2.2	5.3		2.3	Public sphere
36	Call/write representatives	1.1	5.3		1.9	Public sphere
37	River clean up – participate	3.4	2.1		1.6	Public sphere
Total (percent)		100.0	100.0	100.0	100.0	
Total (count)		89	94	125	308	

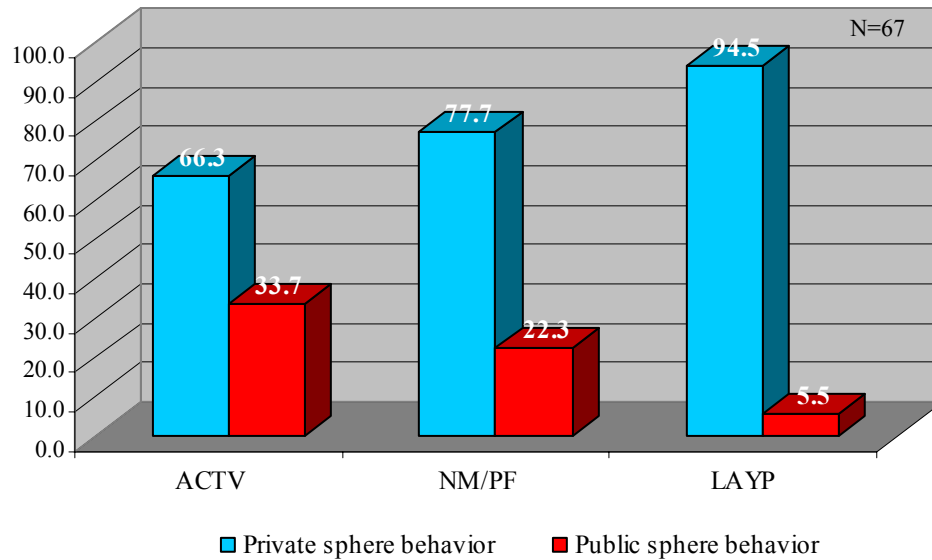


Figure 6.3: Percentage distribution of private and public sphere behaviors by level of activism candidates (9%), conserve energy/electricity, careful about the products bought/used are the other pro-environmental behaviors of secondary importance reported by ACTV (Table 6.1).

LAYP are primarily involved in private sphere (94.5%) pro-environmental behaviors (Figure 6.3). However, a few laypersons (primarily persons involved in community activities) also reported public sphere behaviors, for example, attending public hearings, attending commission meeting, and lobbying for environment. For LAYP, recycling is the most reported behavior (29.6%) followed by does not litter/pickup trash/litter (13.2%), dispose garbage/toxics appropriately, and maintain car regularly (Table 6.1). Noteworthy is the *do not litter/pickup trash/litter* as a concept of pro-environmental behavior, which is not held by most ACTV and NM/PF. Perhaps, this concept has historical roots to the environmental movement of the 1960s and 1970s, when First Lady Claudia Johnson emerged as the leader for the beautification movement, Keep America Beautiful campaign (Clarke and Cortner 2001; Rothman 2000). She was a primary advocate of a number of aspects of the new environmentalism like clean up of U.S. Highways, beautification of urban areas, and the development of a beautification strategy

for inner-city neighborhood and schools (Rothman 2000). Keep Athens-Clarke County Beautiful—a non-profit organization supported by Athens-Clarke County Solid Waste Department and an affiliate of Keep Georgia Beautiful and Keep America Beautiful, Inc.—educates citizens about litter reduction, recycling solutions and proper solid waste practices¹⁰.

Similar to LAYP, recycling (20.2%) is the most reported pro-environmental behavior by NM/PF. Secondarily, educate/talk to others, careful about the products bought, conserve energy/electricity, donate monies, call/write to representatives, and bike/walk to downtown are the other important behaviors reported by NM/PF (Table 6.1). Public sphere behavior (22.3%) is also an important component of NM/PF environmentalism (Figure 6.3). They participate in public sphere activities like public hearing, commission meetings, donate monies to environmental organizations, call or write to public representatives, help/vote green candidates, and river clean up programs (Table 6.1).

6.3.2 Ethnic differences in reported pro-environmental behaviors

Although the pro-environmental behavior score mean for the white sample (3.53) is higher than the black sample (2.92), the difference is not significant at the levels tested ($F=1.36$, $p=0.25$) (Appendix 6.1). Thus the alternative hypothesis of difference in the score mean as defined by ethnicity is rejected. This finding is of further interest in the light that blacks do not differ from the whites in terms of both environmental concerns and reported pro-environmental behaviors.

Recent literature (post-1980s) on black environmentalism indicate that although black environmental concerns are similar to whites (Arp III and Kenny 1996; Jones and Carter 1994; Mohai 1990; Parker and McDonough 1999), overall black participation is limited, which is

¹⁰ <http://keepathensbeautiful.org/>

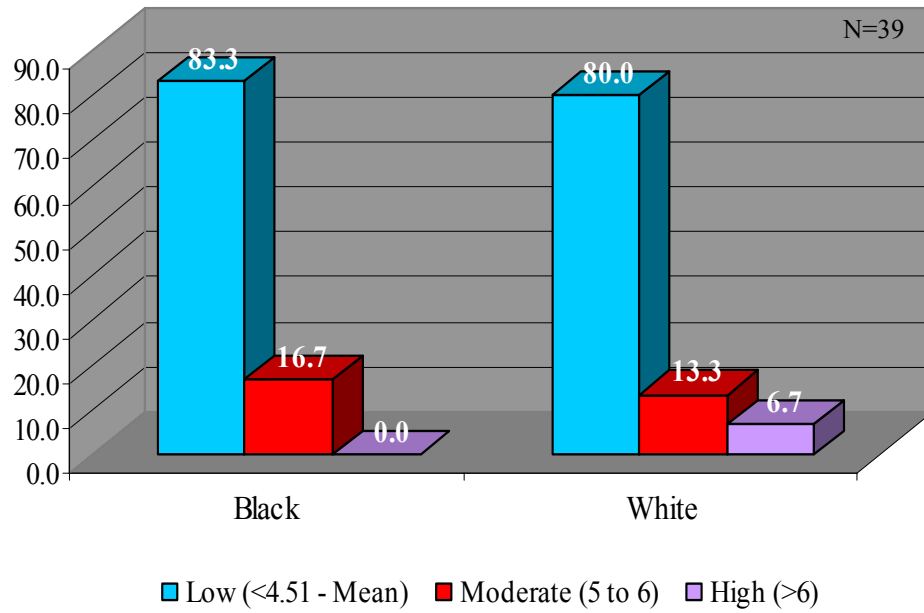


Figure 6.4: Percentage distribution of participants by pro-environmental behavior category and ethnicity

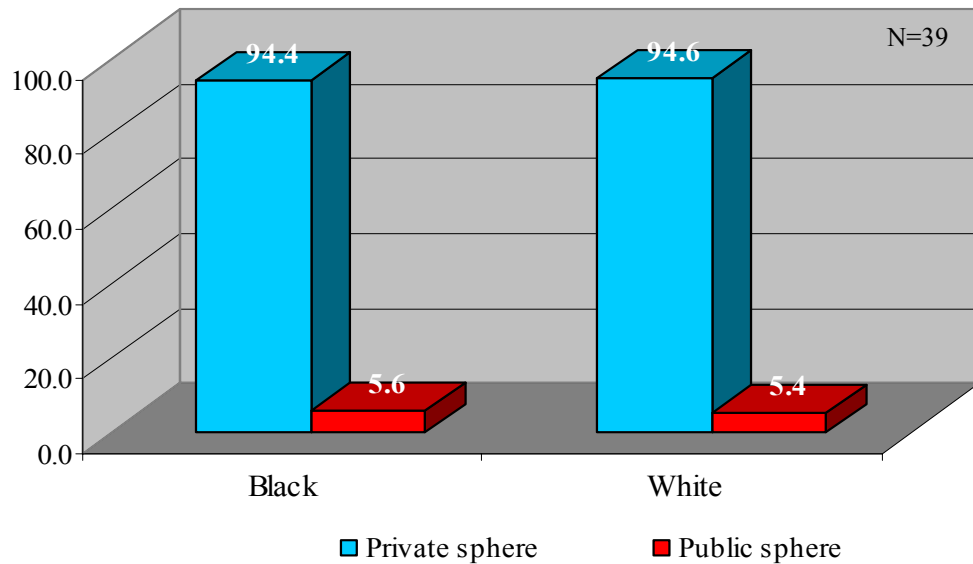


Figure 6.5: Percentage distribution of participants by public and private sphere pro-environmental behavior by ethnicity

explained by barriers theory (Parker and McDonough 1999). However, contrary to this theorization, the participation structure for black and white sample is identical, both in terms of private and public sphere behaviors. Figure 6.4 shows that the percentage distribution for the black and white sample by pro-environmental behavior category is almost identical. Similarly, Figure 6.5 shows that the percentage distributions for the private and public sphere pro-environmental behaviors for the two groups are identical.

This similarity is also observed in the types of primary pro-environmental behavior reported, though white sample has slightly higher percentages (see Appendix 6.2). Recycling and do not litter/pick up trash are the two primary reported behaviors common to both the sample. However, there is difference in the percentage of sample reporting the behavior. While 53% of the white sample reported do not litter/pickup trash, only 38% of black sample reported it, which perhaps can be ascribed to the higher levels of aesthetics and recreation value orientation of the white sample (see value orientation in Chapter 4). The other reported behaviors of secondary importance to the sample are: dispose garbage/toxics properly, maintain car regularly, minimize waste/resource use, and save trees/ground cover. Given the hypothesis test results, and percentage distribution of reported pro-environmental behaviors, it is concluded that the pro-environmental behavior makeup for the black and white sample is more similar than different.

6.3.3 Gender differences in reported pro-environmental behaviors

The reported pro-environmental behavior score means for the male sample (3.25) is slightly higher than the female sample (3.05). However, ANOVA run on the behavior score indicated no difference in the score means between the two at the significance levels tested ($F=0.14$, $p=0.708$) (see Appendix 6.1). Thus the hypothesis of difference is rejected.

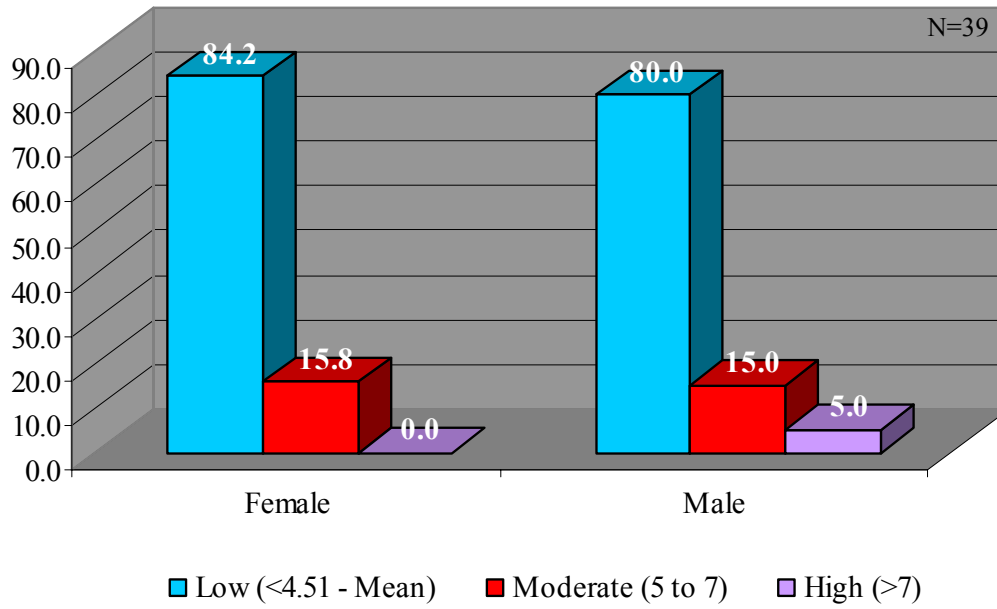


Figure 6.6: Percentage distribution of participants by pro-environmental behavior categories and gender

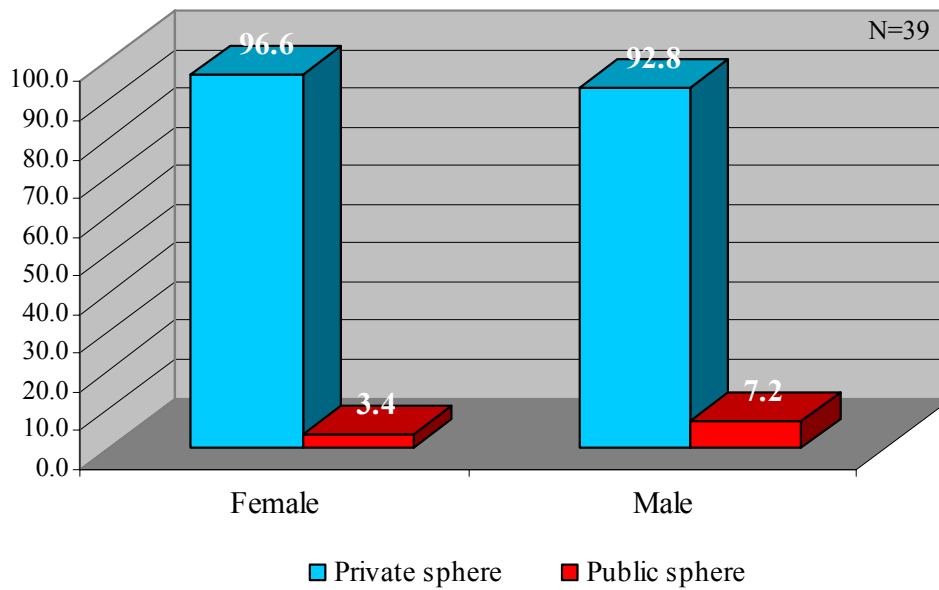


Figure 6.7: Percentage distribution of participants by pro-environmental behavior score count and gender

The similarity in the score means is also reflected in the percentage distribution of the research participants by pro-environmental behavior category (Figure 6.6). The distribution is almost identical for the two. Although male sample is more likely to report participation in public sphere behaviors, there is no plausible reason to differentiate between male and female respondents in terms of public sphere behaviors (Figure 6.7). The two groups are also similar in terms of primary pro-environmental behaviors reported. Recycling and do not litter/pick up trash/litter are the two most reported behaviors (see Appendix 6.3). Although the two groups agree on the primary reported behavior type, some differences in terms of percentage points for other reported behaviors are evident. While male sample are more likely to report dispose garbage/toxic properly, maintain car regularly, and lobby for environment in public and commission meetings, female respondents are more likely to report minimize waste/resource use, careful about the products bought/used, conserve water, and take their own bag to grocery. This difference, though small, indicates gender effect. For example, female reported behaviors are more pragmatic and home oriented; the male sample reported behaviors are more ecosystem (proper toxic waste disposal), and outside home oriented. Given the test results, this difference may not be of significance. However, examination of this result in light of significantly higher environmental concern of male sample is interesting (see Chapter 5). Similarly, as concluded in Chapter 4 males had significantly higher levels of ecosystem and environmental state orientations, but their levels of environmental protection orientation did not differ significantly from female sample. The non-significant difference for environmental protection and environmental behavior is suggestive that though female sample may be less ecosystem/ecology oriented and less environmentally concerned, because of the pragmatic nature of behavioral

orientation, female participants are predisposed to taking pro-environmental actions than male. This perhaps is a reflection of ecofeminism in operation.

6.3.4 Age differences in reported pro-environmental behaviors

The age group 40-60 years has the highest behavioral score mean (3.33), followed by 20-40 years (3.08), and >60 years (3.00). However, ANOVA results indicate that the differences in the score means are not statistically significant ($F=0.15$, $p=0.861$) (see Appendix 6.1). LSD t-test results also indicate no significant difference between the score means. Thus the alternative hypothesis of difference in pro-environmental behaviors is rejected.

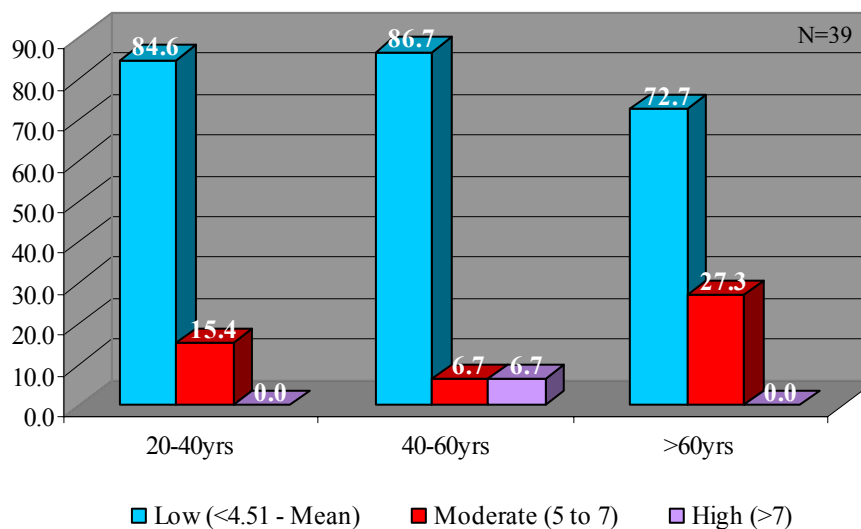


Figure 6.8: Percentage distribution of participants by pro-environmental behavior categories and age

Figure 6.8 shows that there is large similarity in distribution of participants by categories of pro-environmental behavior. Low pro-environmental behavior category (<4.5) account for a very high percentage of the participants in all the groups. Although, >60 years has lower percentage of the participants in the low category, and a higher percentage of participants in the moderate category, it has the lowest score mean. It is primarily due to distribution of participants by pro-

environmental behavior counts: the behavioral score ranged between 1-4 (lower end) for >60 years age group, while for 20-40 years age group it ranged between 2-7, and for 40-60 years age group it ranged between 1 and 8 (see Appendix 6.4).

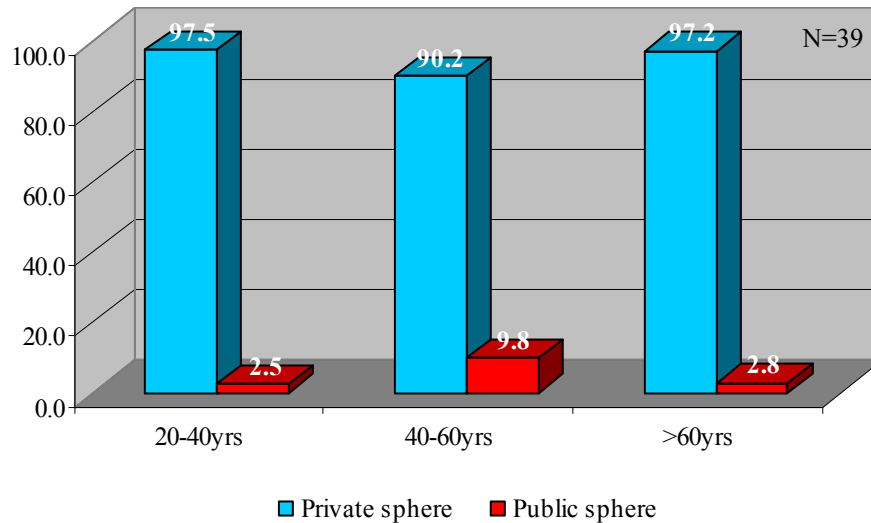


Figure 6.9: Percentage distribution of public and private sphere behaviors by age group

Although there is similarity in the percentage of reported private sphere behaviors, about 10% of the 40-60 years age group reported participation in public sphere behaviors, for example attending public hearings and commission meetings, and voting green (Figure 6.9). This higher level of public sphere behavior participation is cohort effect (Mohai and Twight 1987; Nazarea, et al. 1998) as discussed earlier in Chapter 5. This is particularly true for a middle-aged white female who was in her adolescent in the 1960s and 1970. She is well informed on environmental problems from her personal experiences. She is not an activist and does not participate in public meetings, however, she help and votes green. Recycling and do not litter are the two primary behaviors reported by the groups. While recycling was reported by over 90%, do not litter/pickup trash was reported by over 36% of the participants. These were followed by dispose garbage appropriately, maintain car regularly, and minimize waste and resources (see Appendix 6.5).

Noteworthy, as compared to the other two younger age groups, the percentage of >60 years age group reporting on the first four primary behaviors is impressive, which reinforces the no difference in terms of major behavioral types (Appendix 6.5).

Given the test results and distribution study, age is not a significant factor in explaining pro-environmental behavior in the sample population. This contrasting find is noteworthy in light of the most consistent theory in environmental studies that age is negatively related to environmental concern (Hines, et al. 1986/87; Mohai and Twight 1987; Van Liere and Dunlap 1980).

6.3.5 Education differences in reported pro-environmental behaviors

Given the groups score means ($>UG=3.50$, $UG=3.36$, and $<UG=2.90$), the relationship between education level and pro-environmental behaviors has a positive correlation. But, the ANOVA run on reported pro-environmental behavior score indicate no difference in the groups score means at the significance levels tested ($F=0.51$, $p=0.605$) (see Appendix 6.1). LSD t-test results also indicate no difference between the score means for the groups. Thus the alternative hypothesis H_{A7} of difference in the score means is rejected.

Percentage distribution of participants by pro-environmental behavior category suggest that the distribution for UG and >UG are almost identical. However the distribution for <UG group differs from UG and >UG groups (Figure 6.10). This is primarily due to a larger percentage of participants falling in the lower percentile of the distribution (see Appendix 6.6). However, given a very large percentage of the participants in the low pro-environmental behavior category, the groups are more similar than different. The study of private and public sphere behaviors suggest that level of education is not necessarily an important factor for participation in public sphere behaviors, although people with higher education are more likely

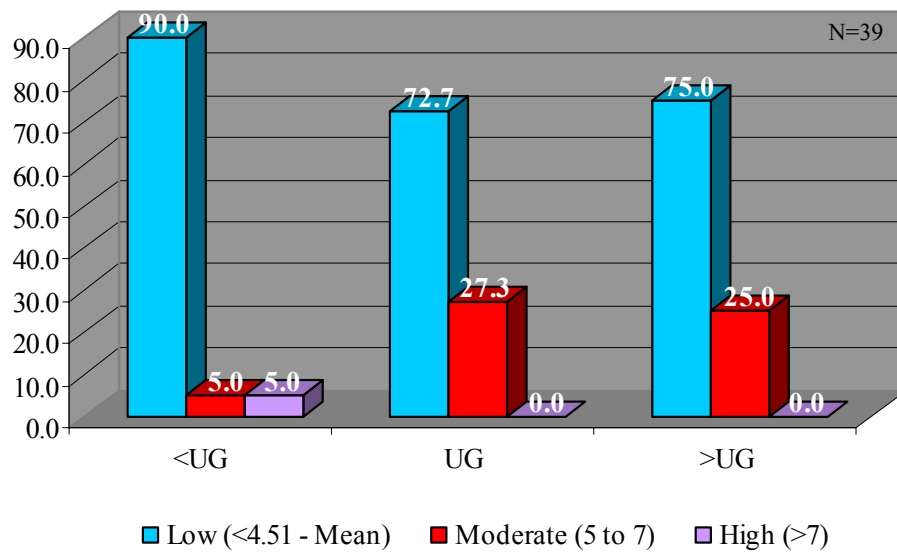


Figure 6.10: Percentage distribution of participants by pro-environmental behavior category and education

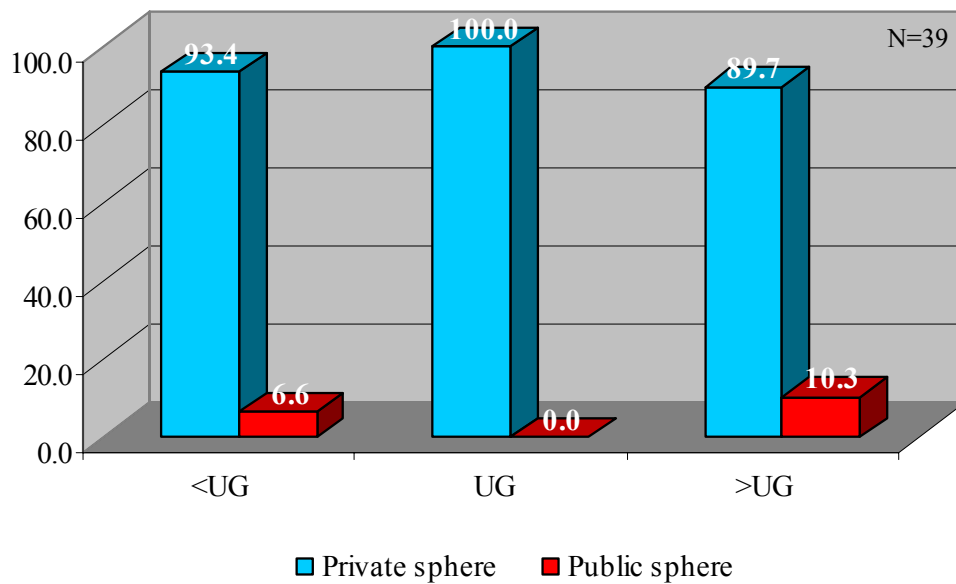


Figure 6.11: Percentage distribution of public and private sphere behavior by education

to participate (Figure 6.11). This is supportive of the finding that education is not a significant factor in explaining reported pro-environmental behaviors. Although, recycling is the most reported pro-environmental behavior for the groups, some variability exists in the other reported behaviors. There is more agreement between <UG and >UG, than with UG. However, over all, do not litter/pickup trashes followed by dispose garbage/toxics appropriately, maintain car regularly are the other reported behaviors of secondary importance (see Appendix 6.7). Given the hypothesis test results and distribution studies, it is concluded that education as a factor is not important in explaining the differences in reported pro-environmental behaviors in the sample.

6.3.6 Correlation between environmental concern and pro-environmental behaviors

Much of social science research on new environmentalism has been to treat environmental concerns and behaviors as dependent variables and identify the best predictor variables, which include demographic, socio-psychological, and socio-cultural. Very little research was designed to study environmental concern and behavior simultaneously, and study the correlation between the two. The closest to concern-behavior (C-B) study is the attitude-behavior (A-B) study in social psychology. However, the concern of A-B researchers is the low predictive power of attitude, i.e. low correlation coefficient 'r' between the two. The effort is thus primarily geared to improve the predictive power of attitude (Kallgren and Wood 1986; Schultz and Oskamp 1996; Wicker 1969). However, it is not the case in concern-behavior study; low correlation means inaction (high concern-low behavior). The objective of this section is to study the correlation between environmental concerns expressed and pro-environmental behaviors reported in the sample. Although outside the scope of this research, an attempt is made to find plausible theoretical explanation/s to the correlation between concern and behavior.

Bivariate correlation analysis for the full sample ($N_{lay}67$) was significant ($r=0.587$, $p=0.000$), suggesting that there is a positive correlation between environmental concerns expressed and reported behaviors. Given the ‘r’ value, the strength of correlation is strong. However, two points need to be considered. First, the sample includes activist environmentalists, which will likely result a high positive correlation. Second, correlation analysis do not discriminate lower values of concern and behavior¹¹. Thus a cross-table distribution analysis is done with pro-environmental behavior categories used earlier in the chapter and environmental concern categories used in Chapter 5. The cross-distribution is presented in Table 6.2.

Table 6.2: Cross-distribution of research participants by environmental concern and behavior categories

Behavior	Concern			Total
	Low ($< \text{Mean} - 10.5$)	Moderate ($10.5 - 14$)	High (>14)	
Low ($< \text{Mean} - 4.5$)	25	13	0	38
Moderate (5 to 7)	4	9	5	18
High (>7)	1	6	4	11
Total	30	28	9	67

Perusal of Table 6.2 shows that of the total 30 participants with low environmental concern, 25 are in the low pro-environmental behavior category, i.e. low concern (LC)-low behavior (LB) group, an undesirable relationship. Similarly, there are 4 low concern-moderate behavior (MB) relationship, a desirable relationship, and 1 low concern-high behavior (HB) relationship, a desirable relationship. Thus out of 30, only 5 desirable relationships exist. Similarly for 28 participants with moderate environmental concern (MC), 13 are in the low behavior category, an undesirable negative relationship. There are 9 MC-MB relationships. Since both are moderate, it may be accepted as a desirable relationship. There are 6 MC-HB, a desirable positive relationship. Similarly, out of 9 high concern (HC) participants, the 5 HC-MB

¹¹ For example even if both the concern and behavior values are in the lower quartile, it can still give positive correlation. But the desired relationship is a positive correlation with values in the upper quartile of distribution.

has a negative undesirable relationship. However, there are 4 HC-HB with desirable relationship. Thus, of the 67 cases, 41 cases have undesirable relationship, and only 26 have desirable concern-behavior relationship. Although, the Pearson correlation show a significant and high positive correlation, the cross-table analysis in essence show that there are more undesirable relationship between concern and behavior than desirable.

A second Pearson correlation analysis between environmental concern and pro-environmental behavior with layperson sample ($N_{lay}=39$) indicate an insignificant positive correlation ($r=0.256$, $p=0.115$). Thus the two correlation and the cross-distribution analyses results indicate that relationship between environmental concern and reported pro-environmental behavior is tenuous, especially in the LAYP sample. Given the correlation analysis, the study concludes that correlation between environmental concern and reported pro-environmental behaviors in the layperson sample is insignificant. The distribution of participants by number of reported behaviors in Table 6.3 reinforces this finding. The table reveals that about 57% of the participants reported four or less pro-environmental behaviors.

Table 6.3: Frequency distribution of participants by number of behavior reported and level of activism

(N=67)

# of reported behavior	ACTV	NM/PF	LAYP	Total	Percent	Cumulative percent
1			4	4	6.0	6.0
2		2	12	14	20.9	26.9
3		2	10	12	17.9	44.8
4		2	6	8	11.9	56.7
5		2	4	6	9.0	65.7
6	2	4	1	7	10.4	76.1
7	2	2	1	5	7.5	83.6
8	3	1	1	5	7.5	91.0
9	3	2		5	7.5	98.5
10	1			1	1.5	100.0
Total	11	17	39	67	100.0	

The tenuous relationship between environmental concern and behavior was also observable during interviews. When the participants were asked if they are environmentally concerned, every participant replied *yes*. Subsequently, when they were asked what they did to protect the environment, the most reported was recycling followed by do not litter and/or pick up trash. Many participants had difficulty reporting three or more pro-environmental behaviors (see Table 6.3). In order to give the participants more time and opportunity to think, the question was repeated a number of times. Many replied that is all what they do, and a few gave unusual answers like “I don’t smoke”, “I feed birds”, “keep house clean”, and “don’t bother wildlife” among others (see Figure 6.1 and Table 6.1). Also, a few confessed that they were not doing enough or their ways were not environmental friendly. Presented below is a sample of quotes which reflects the situation.

The first quote is from a white female respondent. She is knowledgeable of the environmental movement of the 1960s and 1970s and has a good knowledge about the environment. She recycles, conserves water, and votes for environmental candidate. During the course of interview she self-realized and made the following remark.

And yet I live in a big house,...oh, my gosh! ... this is a conflict I’m doing within myself already. So now here doing it in front of you, my own conflict.
Participant - L/WF/40-60yrs/2

The second quote is from an older black female who has a high school education. Although, she is not very knowledgeable about the environment, she is aware of some basic environmental degradation and/or pollution matters. She had a very candid answer to the question what she did to protect the environment.

I’m going to be honest. I’ve never really thought about it? I’m being honest. Like you say you take stuff for granted and when something happens then it makes you think.
Participant - L/BF/>60yrs/5

The following quote is from a young, educated (master's) black male holding an executive position. He recycles, keeps car in good condition, does not pollute water, and does not litter/pick up trash. When asked, what else he did? He replied, he couldn't think of any other thing he did to help environment. Although he did not personally admit that his behaviors are in conflict with his environmental concerns, as a member of a group or society he admits that despite our knowledge of what environment gives us we still mistreat it.

I think we understand from a theoretical standpoint that if we didn't have trees we wouldn't be able to breathe because trees produce oxygen. We all learned that in 8th grade science, I think. But I think because of the mindset that we have of production and development industry, it tends to drive us more towards growth than the preservation of natural resources.

Participant - L/BM/40-60yrs/3

The next quote is from a 60 years old white male with undergraduate in business. He has just retired. He is a passive member of Sierra Club and receives its newsletter. When asked what he does to protect the environment, he replied that he does five things: recycles, composts, sometimes write or call congressman, participates occasionally in river cleanups, and is a member of environmental organization. He feels that he could do more, but does not:

We will do river walk clean ups and the road side clean ups organized by ACC government once in a while, but we don't do a lot to be honest with you. I don't do nearly as much as I should.

Participant - P/WM/40-60yrs/6

The final quote is from a young white male who has a master of divinity and some knowledge on environment, although he considers he knows very little. He is concerned about the environment. He recycles and picks up trash and litters. He has a power mower, which he calls *weed eater*, and knows that it pollutes at a higher rate than most cars. Given below is his concern for environment, but not taking a stand, politically, for the environment.

I'm concerned about emissions from cars and weed eaters and lawn mowers. Somebody told me that the weed-eater that I use in my yard pollutes the air ten times faster than a car does... I'm concerned about those things but I haven't taken a political stand.

Participant - LP-WM<40-01

It is important to note that while many research participants (as seen in the quotes above) realize that environmental conditions are not good and it needs to be protected for self and future generations, they at the same time realize that their behaviors are in conflict with their concerns and that they are not doing enough for the betterment of the environment. This is an interesting phenomenon for future research.

6.4 Theoretical Explanations to the Weak Concerns-Behavior Relationship

Studying the theoretical underpinnings for the weak correlation between environmental concern and pro-environmental behaviors was not within the scope of the dissertation research. However, some available possible explanations are presented.

The weak correlation might be due to mere lack of knowledge as evident in the simple forms of environmental degradation reported by most LAYP, the lower levels of environmental awareness, and inadequate capability to link social, economic, and political ramifications of environment use, especially, in the LAYP sample. Additionally, analyses reveal that although LAYP did not differ significantly from ACTV and NM/PF in terms of volunteering simple forms of environmental degradations, they differed in terms of complex forms of environmental degradation, level of overall environmental concern and environmental protection orientation, suggestive that the LAYP does not have the same level of concerns and urgency to protect environment. This is a probable reason for the discrepancy between concerns and behavior. However, it needs to be recognized that given the complex nature of *human nature*, it is very difficult to understand human behavior. Besides lack of knowledge and sense of urgency explanations, two theoretical explanations are found. They are discussed below.

6.4.1 Social dilemma - Revisiting the “Tragedy of the Commons”

Two seminal works, namely, Mancur Olson’s (1965) *The logic of collective action*, and Garret Hardin’s (1968) *The tragedy of the commons* (Hardin 1968) provided the impetus for what has become the field of social dilemma research (Schroeder 1995). A few social psychological studies on personal environmental behavior mentioned in passing the environment as a type of *common pool resource* and its pollution a *social dilemma* (Diekmann and Preisendorfer 1998; Karp 1996; Schroeder 1995). A very few research have investigated the determinants of behaviors in social dilemma paradigm (Schroeder 1995). Perhaps, it is because of the fact that social dilemma and common property research have primarily concentrated on tangible natural resources, as opposed to intangible environmental resources like environment and air quality and/or pollution among others. Social dilemma in essence is a conflict between egoistic, self-serving desires and the common societal good. Formally, social dilemmas are characterized by three properties: a) non-cooperative choice is always profitable to the actor than a cooperative choice that benefits the society regardless of choices made by others; b) the noncooperative choice is always harmful to others, as opposed to cooperative choice; and c) the aggregate amount of harm done to others as a result of noncooperative choice is greater than the profit accrued to the actor (Dawes 1980; van Lange, et al. 1992).

An example of N-person dilemma is the decision to pollute. A hypothetical example for N-person dilemma game is presented in Figure 6.12. Here the dominant strategy is always profitable as opposed to the common interest choice. For example, for common interest choice $2/4n$, payoff for C-strategy is 60, while payoff for D-strategy is 120.

Individual or egocentric rationality prescribes non-cooperation, because payoff outcome from this decision is higher than from a cooperative decision. Common interest choice rationality

prescribes cooperation, because each individual is better off when they cooperate than when they do not cooperate (van Lange, et al. 1992). Thus in social dilemma research egocentrism is the key variable, although the given situation defines the option chosen from an array of options.

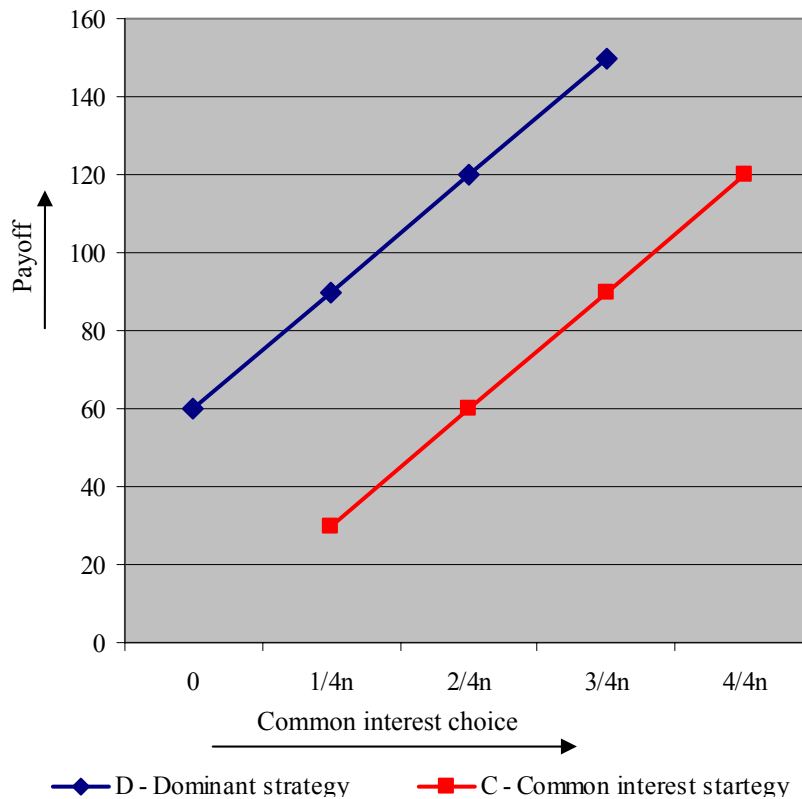


Figure 6.12: Payoff schedule for N-person prisoner dilemma game
(Source: Adapted from van Lange et al. 1992)

Egocentric nature of human was identified by scholars in geography, e.g., Yi-Fu Tuan (1968, 1970, and 1971), but not as a social dilemma paradigm problem. He wrote “Man is egocentric” (Tuan 1971). Some research in social psychology on environmental concern and behavior (Stern and Dietz 1994; Stern, et al. 1993; Stern, et al. 1995b) used egoism or individualism as a value to study their relationships, but not in a social dilemma paradigm. Social dilemma research is conducted primarily in an experimental game paradigm (Schroeder 1995), which perhaps is the reason why social psychologists using questionnaire survey research do not

adopt the paradigm in empirical study of environmental behaviors. Perhaps a very well thought out research adopting quantitative and qualitative techniques, and anthropological skills is warranted to study the discrepancy as a social dilemma paradigm problem.

6.4.2 Is “Cognitive dissonance” at work?

Cognitive dissonance theory introduced by Leon Festinger in 1957 had been one of the most influential theories in social psychology, which however by the end of 1970s all but disappeared from the social psychology literature (Aronson 1992; Harmon-Jones and Mills 1999; Stone 2001). Festinger (1957) wrote:

If a person held two cognitions that were psychologically inconsistent, he or she would experience dissonance and would attempt to reduce dissonance as one would attempt to reduce hunger, thirst, or any drive. (Aronson 1992)

Two relevant cognitions can either be consonant or dissonant. The two cognitions are consonant if one follows from the other, and they are dissonant if the obverse of one cognition follows from the other. Individuals experience dissonance when they say things they do not mean or behave in ways that are inconsistent with their underlying attitudes or values. Dissonance is thus psychologically an uncomfortable or unpleasant state, which motivates the individual to reduce the dissonance (Baron and Byrne 1994; Harmon-Jones and Mills 1999). Except for *forced compliance*¹², when such a dissonance occurs, something has to be changed, for example, cognition, value, attitude, or norms among others. The greater the magnitude of dissonance, the greater is the pressure on the individual to reduce dissonance (Harmon-Jones and Mills 1999). Several possibilities exist to reduce the dissonance: a) individuals can change their attitudes; b) individuals can change their cognition about their own behavior; c) acquire new information that is consistent with the attitude or action; and d) minimize the importance of

¹² In incidents when one is forced by circumstance to say or do things contrary to one's real views, values and norms.

inconsistency. People seek to reduce the inconsistency in the way that is least effortful (Baron and Byrne 1994).

It is easier to cope with dissonances of one-time or ephemeral event nature. However, the type of dissonance that is encountered between environmental concern and behavior is lasting. For example, people know that larger automobiles generate more pollution but they continue to drive them. Although this research was not designed to study cognitive dissonance, there are indications that perhaps cognitive dissonance theory is at work. Presented below are a few examples of possible cases of cognitive dissonance.

Perhaps there was a case of *acquiring new information that is consistent with the attitude or action type*. When asked “Why he drove a larger vehicle?” the research participant replied that vehicles these days are more fuel efficient than automobiles of yesteryears. The other possible cases of cognitive dissonance corrections do not fit the types outlined above. Perhaps the confessions made by the participants with regards to environmental behaviors reported are a form of reducing the dissonance. The quote presented below may be called *self-justification*. The justification given was not asked for. Perhaps it was given due to the fact that she is a passive environmentalist, and there was a greater magnitude of dissonance. The justification is given below:

I've got a Subaru station wagon, it has a 4 cylinder. My husband's car is a 6 cylinder. Ford Escape, they're not huge. They're not excessive, they are bigger than like a compact car, but we've got a big dog and I feel that our cars are justified.

Respondent - PP-WF<40-04

Given the little evidence in this study, a research designed to test hypothesis based on cognitive dissonance theory is one promising area that environmental concern and behavior research can focus in future to explain the dissonance or the weak correlation between observed concern and behavior.

6.5 Summary and Conclusion

The chapter dealt with studying the reported pro-environmental behaviors of the study population. The objective was to study the levels of reported pro-environmental behaviors and identify the socio-cultural correlates that explained the variance in the sample. A broadly defined alternative hypothesis H_{A8} was to test that the variability in the reported pro-environmental behavior is a function of level of activism, ethnicity, gender, age, education, and environmental concern. ANOVA, LSD t-test, Pearson correlation, and cross-distribution, and graphical analyses were performed to study the data. Differences in environmental behavior by level of activism used the full sample ($N_{full}=67$), while differences in concern by ethnicity, gender, age and education used layperson sample ($N_{lay}=39$).

The sixty seven participants reported 308 behaviors, which were coded into 37 categories. A percentage distribution analysis showed that recycling is the most reported behavior. It accounted for 21.8% of the total reported behavior. Of the 67 respondents, 65 (97.0%) recycled. *Do not litter or pickup trash/litter* was the next most reported behavior, but a distant second at 6.8 percent. Lobby for environment/member of environmental organization, careful about the products bought/used, conserve energy/electricity, educate or talk to others, and minimize waste/resource were the reported behaviors of secondary nature. Given the percentage distribution, and the large difference between the first most reported (recycling) and the second most reported behaviors (do not litter/pickup trash/litter), it is indicative that besides recycling, pro-environmental behavior as a form of culture has not developed. The types of reported behaviors look more random than systemic.

Hypothesis testing on reported pro-environmental behaviors by level of activism (ACTV, NM/PF, and LAYP) suggested a significant difference in the groups score means. The alternative hypothesis H_{A8} of difference in the groups score mean was thus accepted. ACTV had the highest

group score mean (7.91) for the reported pro-environmental behaviors, followed by NM/PF (5.41), and LAYP (3.15). The LAYP mean was below the sample mean (4.51), and a large percentage (82.1%) of them was classified into the low pro-environmental behavior category.

The second hypothesis testing was performed on the number of reported pro-environmental behaviors by ethnicity (black and white). Although, white sample had a little higher score mean (3.53) than black sample (2.92), the difference in the groups score means was not significant at the levels tested. Thus the alternative hypothesis of difference was rejected. Percentage distribution of black and white sample for public sphere and private sphere pro-environmental behaviors were almost identical. This finding of no difference is of particular interest given: a) traditional theorization that blacks are rated lower for environmental concern than white, and b) the more recent theorization that blacks are equally concerned but with limited participation/action as explained by the barriers theory (Parker and McDonough 1999).

Although the male sample had a higher score mean (3.25) for pro-environmental behaviors than female sample (3.05), hypothesis testing revealed that the difference was statistically insignificant at the levels tested. Thus the hypothesis of difference was rejected. This finding is in contrast to the theory of ecofeminism (Diamond and Orenstein 1990; Merchant 1979; Stern, et al. 1993). But, study on gender differences in environmental concerns report mixed results and inconsistencies (Hines, et al. 1986/87; Stern, et al. 1993). However, this study suggest that though women may be less ecosystem oriented and environmentally concerned than men, their pragmatic nature, as reflected in the types of behavior reported, suggest that female are predisposed to taking pro-environmental action than male.

As regards to hypothesis testing on age differences in reported pro-environmental behaviors, ANOVA suggested insignificant difference between the groups score means. Thus the

hypothesis of difference was rejected. This finding is contrast to the most consistent theorization in environmental social science literature that age is negatively correlated with environmental concerns (Hines, et al. 1986/87; Van Liere and Dunlap 1980). The 40-60 years age group, who were coming of age or growing during the environmental era of the 1960s and 1970s, has the highest score mean for pro-environmental behaviors, suggesting *cohort effect* (Mohai and Twight 1987; Nazarea, et al. 1998). Given the finding, it is predicted that the negative relationship age theory will slowly become weaker as the generation growing up in the 1960s and 1970s gets older.

Traditionally, education—as a component of social class theory—is hypothesized to have a positive correlation with pro-environmental concerns and behaviors (Buttell and Flinn 1978; Van Liere and Dunlap 1980). However, contrary to this theory, hypothesis testing indicates that education is not a significant factor in explaining reported pro-environmental behaviors in the study sample. The study also suggests that participants with lower levels of education (<undergraduate) participate in public sphere pro-environmental behaviors, as well.

The final study on correlation between environmental concerns and behaviors suggested a strong positive correlation ($r=0.587$, $p=0.000$) in the full sample, which included ACTV and NM/PF. However, when the correlation analysis was run on the LAYP sample, the correlation ($r=0.256$, $p=0.115$) was insignificant, suggesting a tenuous relationship between concern and behavior in the LAYP sample. Lower levels of environmental knowledge as reflected in the forms of environmental concerns expressed and fewer reported pro-environmental behaviors, and inadequate capability to link socio-economic-political ramifications of environment use may be the primary reasons that explain the weak relationship in the LAYP sample. However, there are other theoretical explanations, namely, social dilemma and cognitive dissonance theories.

Therefore, future research on the relationship between concerns and behaviors in the light of *social dilemma* and *cognitive dissonance theories* is suggested.

Overall, the analyses in this dissertation conclude the following. Recycling is the most reported pro-environmental behavior by the research participants. Ninety seven percent of the 67 participants reported recycling; and of the total pro-environmental behaviors reported (308), recycling accounted for 21.8 percent. The next most reported behavior *do not litter/pickup trash/litter* was a distant second, which accounted for 6.8% of the total behavior reported. Given the nature of distribution of reported behaviors—the large number of types of behaviors reported, but by small percentages of participants—the study concludes that, besides recycling, there is no societal response as a form of culture to the environmental concerns expressed by the sample. The distribution of reported behaviors suggests the responses are more random than systemic.

Level of activism is identified a significant factor explaining the levels of reported pro-environmental behaviors. However, contrary to most research findings and theories, ethnicity, gender, age and education were not significant in explaining the pro-environmental behaviors of the research participants. Based on bivariate correlation analysis, the study concludes that the correlation between environmental concern and behavior in the layperson sample is insignificant (tenuous). This may be primarily due to lower levels of environmental awareness in the LAYP sample. A future research using social dilemma and cognitive dissonance theoretical frameworks is essential to study the concern-behavior relationship, seeking explanations to the identified discrepancy.

CHAPTER 7: SUMMARY AND CONCLUSION

7.1 Summary

This dissertation is a study of everyday American environmentalism in Clarke County, Georgia in southeastern United States. The research was sparked by the statistical finding that more than 90 percent of Americans worry about environmental problems (Axelrod and Lehman 1993). Given this statistic, the high level of consumerism (Clarke and Cortner 2001; Steinberg 2002), and Christianity as a proclaimed root of the ecological crisis (White 1967), questions related to environmental perception, and relationship between environmental concern and behavior spontaneously arise.

Review of the literature indicates a paucity of research designed to study American environmental concern and behavior simultaneously. The trend is to treat them as dependent variables and then identify the set of independent variables that best predict them. Additionally, very little is known about environmentalism of Afro-Americans and other ethnic minorities as compared to Euro-Americans. This dissertation research is thus an attempt to answer two broad research questions:

- How does perception of environment vary in the study population as defined by level of activism, ethnicity, gender, age, and education?
- What is the variability in environmental concern and reported behaviors, and the correlation between the two in the study population as defined by level of activism, ethnicity, gender, age, and education?

Environmental perception in the sample population was studied by examining the differences in: a) definition of environment, b) levels of ecosystem, environmental state, and

environmental protection orientations, c) type of values associated with the environment, and d) socio-economic-political ramifications of environment use.

Environment may mean and constitute different things to different persons. *Cultural Consensus Analysis* run on slip-sort exercise data found the One Culture assumption true in the sample. Since 7 factors were extracted, a cluster analysis yielded three clusters, (i.e. three ways of defining environment), and a group of outliers. Almost all members of the first cluster, the cultural consensus cluster, classified 68 items used in the slip-sort exercise as environment. However, the other two clusters excluded built objects from their definition of the environment. The differentiation between the second and third clusters was based on the inclusion or exclusion of microorganisms in the definition of environment. This finding shows that there are groups in the population which consider only the natural environment the environment. Interestingly, many of them invoked their religious belief while defining environment. To them God's creation is natural. Since human is God's creation, human is natural and a part of environment.

Analyses results suggest a difference in the perception of environment by level of activism—i.e. between ACTV, NM/PF, and LAYP. As expected, the LAYP group was found to be least ecosystem oriented—i.e. they have less knowledge on ecosystem. Also, they were least aware about the state of the environment, and showed a low level of urgency in the protection of the environment. Additionally, the LAYP sample did not adequately link and/or understand the socio-economic-political ramifications of environment use. These finding thus has an implication in terms of interpretation of public environmental concerns in opinion polls. The environmental concerns expressed by LAYP are not adequately informed by ecological knowledge and socio-economic-political ramifications of environment use.

The research participants invoked twelve kinds of values, namely, consumptive, beauty, ecological, psychospiritual, ugly, recreational, negative, intrinsic, religious, heritage, medicinal, and educational/scientific. Consumptive, aesthetics (beauty, ugly, psychospiritual, and recreational), and ecological were identified the primary values in the sample. Analyses indicate that five values, namely, beauty, ecological, recreational, negative, and intrinsic/existence differed significantly by level of activism. Negative value was an important finding, which was salient for ACTV and NM/PF. Although beauty was salient for LAYP sample, the other aesthetics-related values were salient for ACTV and NM/PF conforming to the recreation-based origin of American environmentalism in the mid-nineteenth century. A few laypersons volunteered intrinsic/existence value, however, it was primarily salient for ACTV and NM/PF samples. An important finding of the study is the religious basis of environmental value and environmental protection orientation, which was primarily salient for LAYP sample. To them since the Earth, the environment, and nature are God's creation, all belong to God and it is wrong to abuse them. Humans are thus seen as stewards. And, as stewards humans are responsible to protect and take care of God's gift to humans, or God's belonging. This finding is antithetical to Lyn White's (1967) classic thesis of *Christianity the root of ecological crisis*.

Study on ethnic differences in the perception of environment suggest no difference between lay black and lay white samples in terms of levels of ecosystem orientation (knowledge), environmental state orientation (quality), and environmental protection orientation (attitude). This finding is interesting for traditionally blacks are rated lower than whites in environmental attitude and concern, although recent studies show similar levels of attitude and concern between the two (Jones and Carter 1994; Mohai 1990; Parker and McDonough 1999). However, the two groups differed in terms of value orientations. Blacks had significantly low

levels of aesthetic and recreation related ugly, recreational, and negative value orientations. The white middleclass-based culture of recreational use of wilderness/natural parks, which began with modern environmentalism in the mid-nineteenth century (Petulla 1988; Steinberg 2002), the historically low socioeconomic status of the black population in general, and more importantly the segregation as late as 1960s explains the lower aesthetic and recreational value orientation in the lay black sample. A similar conclusion was arrived in a study which reported that black respondents were least likely to indicate values associated with visitation and on-site use of wilderness as compared to white respondents (Johnson, et al. 2004a).

Analyses results on gender differences indicate that males have a higher level of ecosystem and environmental state orientations than females. However, an interesting finding is they did not differ in their environmental protection orientations—both sample showed equal sense of urgency. This implies that high levels of ecosystem and environmental state orientations do not necessarily translate to environmental protection attitudes, and that females are practice oriented. Females carried significantly higher levels of non-materialistic values: beauty and psychospiritual, while males carried higher levels of materialistic values: consumptive and ecological. These findings suggest that women are more pragmatic and non-materialistic oriented than men.

Study of age differences in the perception of the environment revealed that age is not a significant factor in explaining ecosystem, environmental state, and environmental protection orientations. This finding of no-difference is particularly interesting because social science literature consistently claim younger people to be more pro-environmental than people of older age category. However, age difference was observed in their value orientations. The 20-40 years age group differed significantly from the other two age categories on ugly, intrinsic, recreational,

and negative values of environment. This suggests that younger generation has a different value preference which is aesthetic, biocentric, and socioecological oriented.

The study of education differences in the perception of the environment revealed that there are no significant differences in the ecosystem, environmental state, and environmental protection orientations. However, they differed only in their psychospiritual value orientations. The undergraduate group had a higher level of orientation than the other two groups. However, this was found to be more an interaction between age and education than education effect alone. Thus it is inferred that young people with college degree are likely to carry higher levels of aesthetic related psychospiritual value of the environment.

Analyses of environmental concerns revealed that level of activism is an important factor in explaining levels of environmental concerns in the sample. ACTV showed the highest level of environmental concerns followed by NM/PF and LAYP, which differed significantly between them. The intervening variable for this difference is primarily ecological knowledge. While ACTV and LAYP associated environmental concern with all environmental forms, LAYP primarily associated it with factory, highway/traffic congestion, logging, landfill, city, and strip mall. They least associated environmental concerns with environmental forms like arid area, cattle/pasture, chicken houses, manicured lawn, and stream which afford little visual cues of environmental degradation/pollution. ACTV, NM/PF, and LAYP did not differ in terms of simple forms of environmental degradations volunteered to express their environmental concerns. However, ACTV and NM/PF volunteered more frequently the complex forms of environmental degradation than LAYP sample to express their environmental concerns. Similarly, analyses of reported environmental behaviors suggested a significant difference between the groups. While a large percentage of ACTV and NM/PF participants fell in the

moderate and high levels of pro-environmental behavior categories, about 82% of the LAYP sample fell in the low pro-environmental behavior category.

Analyses of difference in the levels of environmental concerns and behaviors as defined by ethnicity indicate that the lay black and the lay white samples do not differ significantly. This finding is particularly interesting in the light that blacks are traditionally considered to be less environmentally concerned than whites (Buttell and Flinn 1978; Van Liere and Dunlap 1980). However, later studies indicate that black environmental concerns are similar to or higher than whites (Arp III and Kenny 1996; Jones and Carter 1994; Mohai 1990; Parker and McDonough 1999). But their over all participation is limited, which is explained by barriers theory and personal efficacy factors (Parker and McDonough 1999). However, the finding of this research suggest otherwise. Analyses indicate that black participation in both private and public sphere pro-environmental behaviors is almost identical to the white sample (see Figure 6.7).

Studies on gender differences in environmental concerns and behaviors indicate that although males showed a significantly higher level of environmental concerns, male and female groups did not differ in their levels of reported environmental behaviors. This finding is interesting both in the light of ecofeminist theory and the non-translation of higher levels of concerns into appropriate level of behaviors. Ecofeminist theory suggests that by nature females are more pro-environmental than their male counterparts (Diamond and Orenstein 1990; Merchant 1979; Stern, et al. 1993). But studies on gender differences in environmental concerns report mixed results and inconsistencies (Hines, et al. 1986/87; Stern, et al. 1993). However, some difference in behavioral preferences is observed between males and females. Female reported behaviors are more pragmatic and home oriented, male reported behaviors are more outside home oriented. For example, while male samples are more likely to report dispose

garbage/toxics properly, maintain car regularly, and involve in public sphere activities, females are more likely to report minimize waste/resource use, careful about the products to be bought, conserve water, and take their own bags to grocery stores. Given the non-significant difference in environmental protection orientation and environmental behavior, the pragmatic and home oriented behavioral preferences make females predisposed to taking pro-environmental actions than males, which is, perhaps, a reflection of ecofeminism in operation.

The study indicated no significant age differences in environmental concerns and reported behaviors. This finding is interesting in the light that it is in contrast to the most consistent theory in environmental social science literature that age is negatively correlated to environmental concerns (Hines, et al. 1986/87; Van Liere and Dunlap 1980). The non-significance is primarily due to higher level of behavioral scores of 40-60 years age group participants who were growing up or coming-of-age in the 1960s and 1970s, suggesting *cohort effect* (Mohai and Twight 1987; Nazarea, et al. 1998). Given this finding, it is predicted that as the generation coming-of-age during the 1960s and 1970s gets older, the negative age-concern relationship theory profound in social science environment literature will slowly become weaker and, perhaps, wane away.

Traditionally, in the social science environment literature, education as a component of the social class theory is hypothesized to have a positive correlation with environmental concerns and behaviors (Buttell and Flinn 1978; Van Liere and Dunlap 1980). However, contrary to this theorization education was not a significant determinant of the levels of environmental concerns and behaviors in the sample. Participants with lower levels of education also participated in public sphere behaviors like helping/voting green candidates, and attending public hearings and

meetings. This is indicative that general education, unless ecological science, is not an important factor in explaining environmental concerns and behaviors in the LAYP sample.

The final study on correlation between environmental concerns and reported behaviors suggest that the correlation is positive and significant, when the ACTV and NM/PF samples are included in the analysis. However, when the analysis was run on the LAYP sample, the correlation was weak and insignificant, suggesting a tenuous relationship between environmental concern and behavior. Given the lower levels of environmental state awareness and concerns of laypersons—as reflected in their inability to discern environmental degradation/pollution in environmental forms which afford little visual cues of pollution—lower levels of ecological knowledge is one reason for the weak correlation. However, given their general knowledge of environmental degradation and, especially, their self-recognition of not doing enough, it is concluded that there is a discrepancy in between environmental concerns expressed and environmental behaviors reported.

7.2 Implications of Research Findings

7.2.1 Modified thematic apperceptions test as a method

A key feature of anthropological research approach is its attempt to gain a holistic perspective on a research question or a problem. This research used a combination of cognitive and ethnographic methods to collect data from research participants. It used modified thematic apperceptions test, slip-sorting, life history interview, and open-ended ethnographic interview methods. This allowed elicit extensive, rich, and in-depth data on the subject matter, and study people's environmental orientations at a higher level of complexity. Noteworthy is the method 'modified thematic apperceptions test' to study perception of the environment and environmental concerns. It has the advantage of representing different environmental forms in a photograph

format, which present visual stimuli to the research participants. This format of data elicitation is qualitatively superior to verbal and questionnaire formats. The method importantly aided the identification of the place of religion in lay people's environmental belief, which would be difficult to elicit in questionnaire survey or even in semistructured survey unless built into it. Similarly, it was possible to obtain at a greater depth the differences in value orientations, ecosystem and environmental state orientations, and environmental concerns without having to ask research participants specific question on these topics. For example, while most laypersons associated environmental problems with factory, landfill, highway/congestion, and strip mall, among others, most of them failed to associate environmental problems with manicured lawn, cattle pasture, stream, and wetland among others. Such elicitation and discernment is not possible in mailed questionnaire survey and difficult even in verbal semi-structured ethnographic interviews. Given the strengths, modified thematic apperceptions test is highly appropriate as a method to study environmental perceptions and concerns for a superior qualitative data elicitation.

7.2.2 Interpretation of poll figures on public environmental concerns

This research suggests that glossed-over use of environmental concerns may be inappropriate. For example, over 90 percent of population is environmentally concerned or 58-73% percent of the population claim to be environmentalists. This research revealed that although the LAYP did not differ significantly from ACTV and NM/PF in terms of volunteering simple forms of environmental degradation, they differed significantly when it came to understanding and volunteering complex forms of environmental degradations. Similarly, the level of overall environmental concerns, environmental protection orientation or attitude, and reported pro-environmental behaviors of LAYP are significantly lower than ACTV and NM/PF.

A large percentage of LAYP participants fell in the low concern (75.6%) and low pro-environmental behavior (82.1%) categories. These findings are suggestive of significantly lower levels of environmental concern and sense of urgency to protect environment in the LAYP sample. Or, the levels of environmental concerns expressed are not backed up by adequate knowledge to give the level of concerns an air of urgency. This research thus suggests a need for appropriate interpretation of poll results and research results that report public environmental concerns and environmentalisms.

7.2.3 Non-point source pollution and environmental education

United States Environmental Protection Agency's (USEPA) earlier programs on environmental protection focused on *command and control* approach, which were effective at reducing point source pollution over the past three decades. However non-point source pollution, less amenable to command and control, is a primary concern now (Doppert, et al. 1993; Sidhu 1993; USEPA 1999). To achieve non-point source pollution reduction an educated public is essential. However, the research suggests that although the LAYP participants are aware of simpler forms of environmental problems, most of them are not knowledgeable of complex forms of environmental degradations, and that they cannot discern and/or associate environmental degradation with benign looking forms of environment like manicured lawn, cattle pasture, streams, and wetland among others. This is suggestive of a lack of adequate level of ecological/environmental knowledge in their ecological/environmental models of degradations. This finding thus suggests a need to educate the public on ecological and environmental knowledge for reduction of non-point-source pollutions. This finding has implications for public agencies, educators, and environmental organizations involved in policy

formulations and program implementations to develop environmentally educated/informed citizens.

7.2.4 Religion and environmentalism

Lyn White, Jr.'s (1967) polemic *The historical roots of our ecologic crisis* brought Christian religion into debate in the environment field. His thesis squarely blamed Christianity for the ecological crisis because of its anthropocentric orientation embedded in the Book of Genesis. Some supported it (McHarg 1969), some opposed it (Guthrie 1971; Wright 1970), while some argued that the debate over biblical environmental despotism or stewardship is in any case simplistic (Kay 1989; Moncrief 1970; Tuan 1970). Realizing the importance of religion in environmental sustainability, environmental and religious groups have since the 1990s increased their interactions at international, national, grassroots, and inter-religious levels (Gardner 2002). However, religion has received little attention as a potential influence in the environmental social science research and/or academia (Guth, et al. 1995; Hand and Van Liere 1984; Van Liere and Dunlap 1980). A few available empirical literature fails to specify exactly which aspects of religious faith and practice influence environmental attitudes and why (Guth, et al. 1995). A multinational study on Judeo-Christian beliefs and environmental concern revealed a consistent pattern across countries: respondents expressing literal belief in the Bible scored significantly lower on environmental concern scale, but no significant relation was found between biblical literalism and self-reported pro-environmental behaviors (Schultz, et al. 2000). Hand and Van Liere (1984) study indicates Judeo-Christians are generally more committed to the mastery-over-nature orientation than non-Judeo-Christians, but this orientation varied considerably among denominations. They found that correlation coefficient for Episcopalians and Lutherans are consistently positive (though insignificant) with environmental concerns, while the coefficients

for Baptist, Mormons and other Sect groups were strongly negative. However, the findings of this dissertation research show the contrary. Most of the research participants were evangelical Baptists and United Methodists. They invoked religion in the most positive way to express their environmental beliefs, concerns, values, and protection attitudes. Given Lyn White's thesis, the debate, and the little but differential and controversial empirical research finding, future research into religion as a potential influence on environmental concerns and ethics is warranted.

7.2.5 Environmental concern and behavior

The trend in environmental social science research is to treat environmental concerns and behaviors as dependent variables and then to identify the best predictor independent variable/s (Dietz, et al. 1998; Olli, et al. 2001; Samdahl and Robertson 1989; Stern, et al. 1993). A few studies, which were not primarily designed to study the correlation between concern and behavior, have pointed to a tenuous relationship between environmental concerns and behavior (Dunlap 1991; Kempton, et al. 1995; O'Riordan 1976; Poortinga, et al. 2004). This dissertation research revealed that there is a tenuous relationship between environmental concerns and behavior in the LAYP sample. The correlation was positive and significant ($r=0.587$, $p=0.000$) when the correlation analysis was run with the full sample, which included ACTV and NM/PF. However, correlation analysis with only LAYP sample revealed a weak correlation ($r=0.256$, $p=0.115$). Although, the data suggest that this discrepancy is due to low levels of environmental knowledge of LAYP sample, there are also evidences that participants are aware of the discrepancy between their concerns expressed and behaviors practiced. The study of the causes of the discrepancy was not within the scope of the research. However, review of literature suggest the possibility of future research on the discrepancy phenomenon under the *social dilemma* framework found in the common pool resource research (Dawes 1980; Schroeder 1995)

and under the *cognitive dissonance* theoretical framework found in psychology (Aronson 1992; Stone 2001).

7.3 Conclusion

The study identified differences in environmental perception in the sample population. Cultural consensus analysis and hierarchical cluster analysis conclude that although there is a general consensus in the definition of the environment in the sample, i.e., One Culture assumption is true, two other ways exist to define it. The differences in the definition are based on three criteria: natural and built objects/environments, and microorganisms. The analyses also identified a group of outliers. The cultural consensus group included both natural and built objects/environments in their definition of the environment, while the other two groups (ways) defined it to include only natural objects/environments. The differentiating criterion for the two groups was microorganisms: one group included them, the other excluded. The natural environment criterion was primarily salient for LAYP sample, which had influence upon their perceived ecosystem and ecological value orientations. They primarily associated these orientations with natural forms of environment.

Level of activism (ACTV, NM/PF, and LAYP) was significant in explaining differences in environmental perception, concern, and behavior. The LAYP sample had lower levels of ecosystem orientation, environmental state orientation, environmental protection orientation, ecological value orientations, socio-economic-political ramification of environment use, and environmental concern and behavior than ACTV and NM/PF samples. Analysis of MTAT data reveal that, as opposed to ACTV and NM/PF, LAYP associated environmental concern with environmental forms which afford visual cues of environmental degradation, for e.g., factory, highway/congestion, landfill, logging, and city. They least associated environmental concerns

with environmental forms which afford little visual cues of environmental degradation or pollution, for e.g., manicured lawn, cattle pasture, chicken houses, and stream, among others. These findings are indicative that laypersons have low levels of ecological knowledge, environmental concern, and low sense of urgency in protecting the environment. An implication of these findings is that the public environmental concerns reported in opinion polls need to be interpreted appropriately for the concerns expressed by public/laypersons differ in terms of degree or intensity because they are inadequately informed by ecological knowledge and possess a low sense of urgency in protecting the environment.

Although the research participants invoked twelve kinds of values, consumptive, aesthetics (beauty, ugly, psychospiritual, and recreational), and ecological were the primary values in the study population. Negative value was an important finding, which was salient for ACTV and NM/PF. Beauty was salient for LAYP sample. However, the other aesthetics-related values were salient for ACTV and NM/PF samples, which conform to the recreation-based origin of American environmentalism in the mid-nineteenth century. Intrinsic/existence value was primarily salient for ACTV and NM/PF samples. An important finding of the study is the religious basis of environmental value, which was primarily salient for LAYP sample.

Study of ethnic (black and white) differences in layperson environmentalism reveal that ethnicity is not an important factor in explaining ecosystem, environmental state, and environmental protection orientations, and environmental concern and behavior. This finding is in contrast to most findings in environmental social science research that rate blacks lower than whites by all accounts. However, the lay white sample had significantly higher levels of aesthetics and recreation related values, namely, recreational, ugly, and negative values. The historically white middleclass-based recreational use of wilderness/natural parks, historically low

socioeconomic status of black population, and socio-political discrimination against black until the 1960s explain the low aesthetics and recreational value orientations in the lay black sample.

Analyses of gender differences in environmentalism indicate that males have higher levels of environmental concern, and ecosystem and environmental state orientations. Although studies have found mixed results, this finding is contrary to ecofeminist writings. However, no gender difference was observed in environmental protection orientation and reported pro-environmental behavior. While females carried higher levels of aesthetics related values, males carried higher levels of consumptive and ecological values. These findings indicate that females are more pragmatic and non-materialistic value oriented than males.

Studies on age differences in environmentalism reveal that age was not a significant factor in explaining ecosystem, environmental state and environmental orientations, and environmental concern and behavior in the layperson sample. These findings are in contrast to the most consistent and strongest theory in environmental social science research that age is negatively related to environmentalism. Although insignificant, 40-60 years age group participants, who were coming-of-age during the 1960s and 1970s, have higher levels of environmental concern and behavior, indicative of *cohort effect*. Given the findings, it is predicted that as the 40-60 years age group gets older the negative relationship theory will become weaker. However, age difference was observed in value orientations. The 20-40 years age group had significantly higher level of orientations for ugly, intrinsic, recreational, and negative values of environment indicating that the younger generation has a different value preference which is aesthetic, biocentric, and socioecological oriented.

Education, as a part of the social class hypothesis, is hypothesized to have a positive relation with environmentalism. However, contrary to the hypothesis, education was not

significant in explaining the differences in environmental perception, concern, and behavior in the LAYP sample. They differed only in their psychospiritual value orientation, which was salient for the undergraduate group. However, this difference is more an interaction effect of education and age than education effect alone. It is thus inferred that young people with college degree are likely to carry higher levels of aesthetic related psychospiritual value.

Although the levels of environmental concern vary significantly as defined by level of activism, there is a general environmental awareness and concern in the sample. The environmental concern expressed is invariant in the layperson sample as defined by ethnicity, age, and education. Given the consumptive environmental use value and the environmental protectionism verbalized during interviews, the environmental ethics held may be termed ecological-anthropocentrism or utilitarian-conservationism. Contrary to the much publicized anti-ecological Christian ethics in the academia, the research participants—primarily LAYP followed by NM/PF—invoked their Christian belief in most positive ways to express their environmental beliefs, values, and concerns. These findings are indicative of presence of positive attitude towards the environment in the study population. However, unfortunately, the levels of environmental concerns and ethos expressed are not adequately translated into action, especially in the layperson sample. Although, there are theoretical explanations to this discrepancy, the research data suggest a lower level of ecological and environmental knowledge in the layperson sample. Public policies and programs geared to enhancing the levels of public environmental knowledge will not only help reduce the discrepancy between concerns and behaviors, but also help reduction of non-point source pollution, a current primary cause of environmental degradation.

Future research in to the discrepancy between environmental concern and behavior is suggested. Social dilemma and Cognitive dissonance theoretical frameworks are possible avenues of future research to study the discrepancy. Religion as a potential influence on public environmentalism has received little or no attention in the environmental social science research. Therefore, future research endeavors should explore religion as an institution and a medium to achieve the goal of environmental sustainability and human survivability.

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APPENDICES

Appendix 3.1 Qualitative survey instrument

Opening and Introduction

May I begin by introducing my research? My dissertation research is on **environment** and **environmentalism**. The title of my research is “Environmental perception, concern and behavior: An anthropological inquiry into everyday environmentalism in the American Southeast”. The research is an attempt to learn and understand how people in general perceive and know environment, and how they express their concerns and behaviors. To simply put, I am trying to learn your perception, cognition, concerns, personal opinions or viewpoints on environment and environmentalism.

This interview is more a discussion or a conversation and a **learning experience** for me than an interview. I am not an expert on environmental science or the science of ecology. May I apprise you that this interview is not about testing your knowledge? There are no right or wrong answers, but people’s conception, opinions or viewpoints, and perspectives. And as you know, people’s perception, conception, viewpoints and perspectives differ, I as an environmental anthropologist am trying to learn how and why they differ.

The interview has **four** parts to it. The first is **life-history interview**, which is basically a brief background about your self. The second is a **card sorting exercise**, followed by **photo-task** on picture or collage of pictures of American landscape, where you will have to comment on the pictures. The third is a **semi-structured interview** on environment. And, the fourth is filling out a **survey questionnaire**.

At times the question might hear **unintelligent** or **stupid** and **simple**. And at times I might ask questions like when, why, or how etc., but it is not an interrogation. However, these questions need to be asked for the sake of research and elaboration. At times you may find some questions overlapped or repeated because of the nature of the topic and method.

May I apprise you that your answers will be held in strict confidence and that the research does not involve any deception or harm? The United States Government law requires the protection of the research subjects. It requires human subjects research approval, which examines whether the research might bring any harm to the research subject or not. To this effect, I have received approval from the Internal Review Board, at the University of Georgia. As per law, I have here a consent form indicating your approval and willingness to participate in this research, for you to read and sign.

Finally, with your permission, may I tape record the interview. I would greatly appreciate if you would please allow me to tape record the interview. Taping the conversation not only improves the data quality, it also reduces the interview time because I do not have to write or take notes as I proceed.

Life history interview

Could you please tell in brief or in general about yourself, your life history, from birth to now? Generally speaking, could you please highlight the following?

1. Where and when you were born,
2. Your family and family values – i.e. the guiding principles and goals
 - What your family most value? Or, what were the desirable primary/guiding principles and goals of life?
3. Would you like to tell about your **childhood** and **teenage** times – where and how was growing up, what things were most valued, what things/people influenced you most, what were your goals.
4. **Education** – where and what did you study, what degree?
5. **Jobs** – what jobs held, title, employer – what kind, and where, annual family income
6. **Religious orientation and practice**
7. **Political orientation** – conservative, progressive-conservative, democratic, liberal-democrat, liberal, libertarian among others
8. **Hobbies** – Could tell briefly about your hobbies, inclusive of out-door recreational hobbies?
9. Do you consider yourself an environmentalist? If yes, why? Active or non-active/passive?
 - Are you a member of environmental organization? If yes, why and how got involved? What inspired?
 - Do you have cross-membership in environmental organizations?
 - Would you please highlight your environmental learning/education experience in school (primary, middle or high school) or college, if any? E.g. environmental clubs, sorority and fraternity, and classroom education etc.
10. How long have you lived in this place, and
11. Others things that you feel are important to be told.

Card Sorting

Before doing photo-task, I would like to ask you about how you conceptualize environment

1. Firstly, could you please tell when you think about environment, what you think of?
2. If a person asks you to describe environment, how would you describe or define it?
3. I have here a number of cards. Printed on them are the names of various things. If you could please do the following for me:
 - Sort or put the cards into to two piles. In one pile please put the things/cards that make up environment or constitutes environment or is environment. In the other put the cards that do not make up environment or is not environment.
 - Could you please tell the basis of the groupings?
4. Do you differentiate between nature and environment? Yes or no? How?
5. Do you distinguish between **natural** and **built** environment?

Photo-Task Interview

Now we will do a photo-task exercise. However, we will comeback to environment after the photo-task. I have here a collection of pictures and collage of pictures depicting American landscape, flora and fauna. If you could please go picture by picture and do the following for me.

- Firstly, could you please tell me what theme the pictures or the collage of pictures depict?
- Secondly, if you could please tell what comes to your mind when you see the pictures? Please tell what you see, know, think, and good/positive and bad/negative things about the pictures--including from an environmental viewpoint.

Semi-Structured Interview

General question on environmental perception

1. Would you say that you have environmental values? If yes, how would you describe those values?
2. How would you describe the role and influence of your family, relatives, friends circle, and **formal education** institutions among other on your environmental values and beliefs?
3. Is human a part of nature or separate from nature?
4. How would you describe the current/contemporary relationship between humans and nature?
5. What should the relationship between humans and nature be?
6. Do you feel you have any **spiritual** or **religious** basis for your beliefs about the relation between human and nature, and environmental values?
7. Would you say that people have a right to use natural resources? Yes/No? To what extent? Why?
8. How would you describe the nature of nature? I mean about its robustness, resilience, vulnerability.

Environmental quality/pollution

9. When you think about environmental quality, what do you think of?
10. When you think about air, water, and soil degradation what you think about?
11. What factors would you say affects environmental quality?
12. Concern/responsibility/protection:
 - Are you concerned about the environment? Yes or No? Why, please describe?
 - Do people have responsibilities toward the environment? Yes/No? How/why?
 - Would you say that protecting the environment is important? Yes/No? Why?
13. Do you recycle? Why do you recycle? When did you start recycling?
13. How can environment be protected? Could you please tell what else do you do, besides recycling, to protect the environment?
14. Do you think it is also worth the extra effort and cost to protect environment on a long-term basis? Yes/No? Why?

Local - Global environmental problems/issues

15. Could you please tell what you know and think about the quality of the environment in your locality? Are there environmental problems or issues? If yes what are they? What caused it?
16. How do you see the local level environmental problems versus the global level of environmental problems and degradation? What is your view? Linkages, if any? Which should get priority etc.?
17. Do you have relations/friends, five of them who you are most in contact with, who are involved in some of environmental activities?
18. Do you talk with other people about environment or not?
19. What is your source for environmental information, e.g. knowledge, facts, status, problems/issues?
20. What type of vehicle do you drive? Make, year and model? Why did you choose to buy this vehicle?
21. Finally, would you like say or bring up anything to the discussion which we did not cover or you think is important that I should know?

Appendix 3.2 Cards used for slip sorting

AEROPLANE	AIR/WIND	AIRPORT	ANTS	APPLE (tree)	BACTERIA (causes infection, TB)
BASS (fish)	BEAR	BUILDINGS	CABBAGE (plant)	CAT	CATTLE
CAULIFLOWER (plant)	BALD EAGLE	COCKROACH	CORN (plant)	CREEK	CROW
DEER	DESERT	DOG	EARTHWORM	FACTORIES	FOREST
FROG	GRAPE (vine)	GRASS	GRASSHOPPER	HERBS	HUMAN/PEOPLE
KUDZU (plant)	LAKE	LANDFILL	MOSS / LICHEN	MOUNTAIN/HILLS	RAILWAY STATION
PRAIRIE	POND	PARK	OCEAN	NEIGHBORHOOD	NATIONAL PARK
RAILWAY TRAIN	RAIN	RIVER	ROADS	ROCKS	SOIL
SNAIL	SHRUBS	SHRIMP	SHOPPING MALL	SHARK	SEA
SAVANNAH (A treeless plain or grassland containing scattered trees)	SAND	SALMON	SPARROW	SPIDER	SQUIRREL
STONE	SUN	SWAMP	TREES	VEHICLES (car, truck)	VIRUS (causes small pox, cold)
		WHEAT (plant)	VULTURE		

Appendix 3.3 Pictures used for photo-task (MTAT)



Appendix 3.4 Themes identified from the photo-task exercise

(N=72)

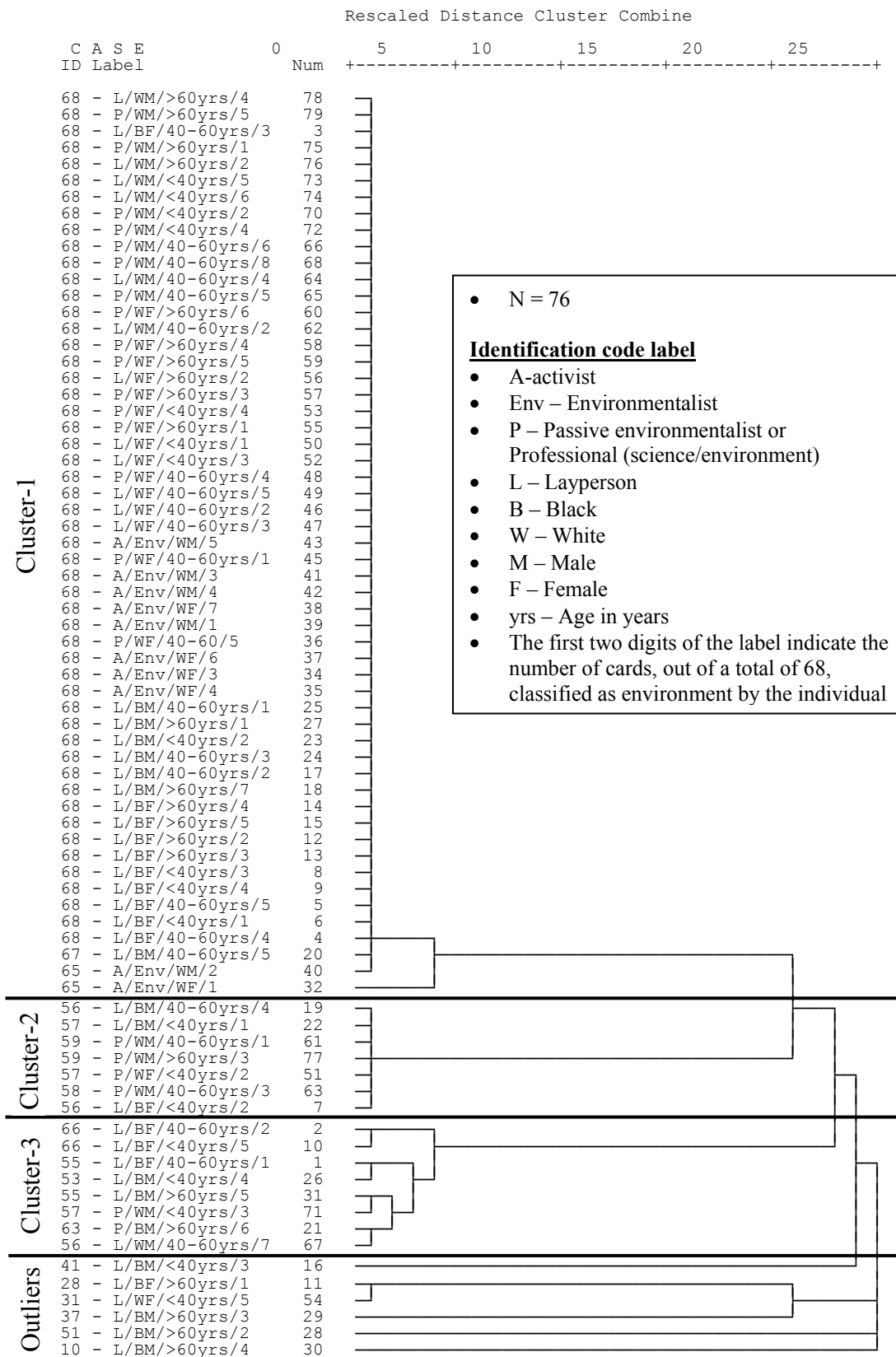
Sl	Themes	Type	% of sample (N)
1	Environmental degradation - simple	Environmental state	100.0
2	Physical degradation of landscape	Environmental state	83.3
3	Loss of wildlife and habitat	Environmental state	79.2
4	Undisturbed, unpolluted & untouched	Environmental state	79.2
5	Ecosystem threat & alteration	Environmental state	55.6
6	Environmental degradation - complex	Environmental state	50.0
7	Looks environmentally well managed	Environmental state	19.4
8	Loss of biodiversity	Environmental state	19.4
9	Sustainability	Environmental state	16.7
10	Loss of medicinal and plant species	Environmental state	9.7
11	Ecological utilitarianism (Envtl. protection)	Ethics	94.4
12	Humane treatment	Ethics	48.6
13	Communalism	Ethics	26.4
14	Religious	Ethics	23.6
15	Stewardship/paternalism	Ethics	15.3
16	Dislike	Personal	63.9
17	Lack of privacy/houses too close	Personal	23.6
18	NIMBY	Personal	20.8
19	Like to own/have (nice house/green lawn)	Personal	15.3
20	Invoking God - positive	Religious/spiritual	30.6
21	Invoking God - negative	Religious/spiritual	2.8
22	Transportation & traffic problems	Socio-cultural	83.3
23	Socio-cultural decay or degradation	Socio-cultural	41.7
32	Population growth/overpopulation	Socio-cultural	26.4
24	Socio-cultural advantages	Socio-cultural	19.4
25	Ecosystem thinking	Socioecological	86.1
26	Excessive use	Socioecological	62.5
27	Need alternate methods, practice or approach	Socioecological	56.9
28	Wasteful	Socioecological	56.9
29	Sprawl and growth	Socioecological	50.0
30	Economics/greed over envt./community	Socioecological	43.1
31	Efficient & less use of resources and chemical	Socioecological	36.1
33	Disconnect	Socioecological	9.7
34	Economy & creation of job	Socioeconomic	65.3
35	Out of business & Loss of job	Socioeconomic	30.6
36	Socio-economic costs	Socioeconomic	6.9
37	Environmental racism & social justice	Socio-political	6.9
38	Political, governance & fiscal policy	Socio-political/economic	50.0
39	Socioeconomic inequity/exploitation	Socio-political/economic	25.0
40	Waste management and recycling	Techno-ecological	66.7
41	Scientific, engineering & industrial achievement	Techno-ecological	23.6
42	Beautiful - pleasing to the eyes	Value	100.0
43	Consumptive value	Value	100.0
44	Utilitarian value	Value	100.0
45	Ecological value (ecological service & function)	Value	83.3
46	Psychospiritual value	Value	62.5
47	Ugly	Value	58.3
48	Recreational value	Value	56.9
49	Negative value	Value	52.8
50	Intrinsic value	Value	48.6
51	Religious value	Value	29.2
52	Heritage value	Value	16.7
53	Medicinal	Value	9.7
54	Educational and scientific value	Value	6.9

Appendix 4.1 Factor loadings for cultural consensus analysis

SI	Items used in the slip sort exercise	Factor 1 - General (Natural)	Factor 2 - Built (Built + Domestic)	Factor 3 - Mixed (Built + Natural landscape)	Factor 4 - Natural (Aquatic)	Factor 5 - Natural (Scapes)	Factor 6 - Natural (Domesticated plants)	Factor 7 - Natural (Microorganisms)
1	Airplane	0.29	0.79	0.48	0.00	0.15	0.07	-0.08
2	Air/wind	0.65	-0.33	0.44	-0.45	-0.09	-0.19	0.02
3	Airport	0.12	0.59	0.75	0.22	-0.04	-0.02	-0.05
4	Ants	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
5	Apple	0.85	0.10	-0.05	-0.45	-0.14	0.13	-0.02
6	Bacteria	0.26	0.50	-0.03	-0.02	0.18	0.37	0.66
7	Bald eagle	0.86	0.17	-0.20	0.33	-0.28	-0.01	0.01
8	Bass	0.86	0.17	-0.20	0.33	-0.28	-0.01	0.01
9	Bear	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
10	Buildings	0.32	0.42	0.80	0.23	0.04	-0.02	-0.05
11	Cabbage	0.77	0.05	-0.28	-0.13	0.09	0.42	-0.11
12	Cat	0.82	0.32	-0.02	-0.22	-0.07	-0.23	0.16
13	Cattle	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
14	Cauliflower	0.77	0.05	-0.28	-0.13	0.09	0.42	-0.11
15	Cockroach	0.81	0.30	-0.21	0.13	0.14	-0.03	0.02
16	Corn	0.77	0.08	-0.08	-0.45	-0.12	0.27	-0.08
17	Creek	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
18	Crow	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
19	Deer	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
20	Desert	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
21	Dog	0.82	0.32	-0.02	-0.22	-0.07	-0.23	0.16
22	Earthworm	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
23	Factories	0.18	0.71	0.59	0.05	0.18	0.00	-0.08
24	Forest	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
25	Frog	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
26	Grape	0.85	0.10	-0.05	-0.45	-0.14	0.13	-0.02
27	Grass	0.76	-0.08	0.16	-0.49	-0.14	-0.02	0.01
28	Grasshopper	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
29	Herbs	0.85	0.10	-0.05	-0.45	-0.14	0.13	-0.02
30	Human/people	0.57	0.33	0.34	-0.15	0.06	-0.30	0.25
31	Kudzu	0.88	0.07	-0.28	-0.10	0.10	0.29	-0.04
32	Lake	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
33	Landfill	-0.03	0.44	0.57	0.15	0.28	0.22	-0.10
34	Moss/lichen	0.88	0.07	-0.28	-0.10	0.10	0.29	-0.04
35	Mountain	0.65	-0.33	0.44	-0.45	-0.09	-0.19	0.02
36	National park	0.45	-0.23	0.49	-0.04	-0.46	0.00	-0.04
37	Neighborhood	0.04	0.36	0.61	-0.21	-0.01	-0.06	0.11
38	Ocean	0.61	-0.47	0.30	0.43	-0.32	0.14	0.08
39	Park	0.45	-0.23	0.48	-0.03	-0.46	0.01	-0.06

Sl	Items used in the slip sort exercise	Factor 1 - General (Natural)	Factor 2 - Built (Built + Domestic)	Factor 3 - Mixed (Built + Natural)	Factor 4 - Natural (Aquatic)	Factor 5 - Natural (Scapes)	Factor 6 - Natural (Domesticated plants)	Factor 7 - Natural (Microorganisms)
40	Pond	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
41	Prairie	0.61	-0.47	0.30	0.43	-0.32	0.14	0.08
42	Railway station	0.12	0.59	0.75	0.22	-0.04	-0.02	-0.05
43	Railway train	0.18	0.71	0.59	0.05	0.18	0.00	-0.08
44	Rain	0.88	0.07	-0.28	-0.10	0.10	0.29	-0.04
45	River	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
46	Roads	0.38	0.33	0.69	0.07	-0.06	0.23	-0.24
47	Rocks	0.61	-0.47	0.30	0.43	-0.32	0.14	0.08
48	Salmon	0.86	0.17	-0.20	0.33	-0.28	-0.01	0.01
49	Sand	0.65	-0.33	0.44	-0.45	-0.09	-0.19	0.02
50	Savannah	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
51	Sea	0.61	-0.47	0.30	0.43	-0.32	0.14	0.08
52	Shark	0.86	0.17	-0.20	0.33	-0.28	-0.01	0.01
53	Shopping mall	0.20	0.71	0.60	0.01	0.14	-0.02	-0.09
54	Shrimp	0.86	0.17	-0.20	0.33	-0.28	-0.01	0.01
55	Shrub	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
56	Snail	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
57	Soil	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
58	Sparrow	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
59	Spider	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
60	Squirrel	0.90	0.24	-0.32	0.10	0.07	-0.12	-0.05
61	Stone	0.60	-0.34	0.47	-0.06	-0.52	-0.03	0.09
62	Sun	0.65	-0.09	0.13	-0.46	-0.13	-0.03	0.01
63	Swamp	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
64	Trees	0.74	-0.55	0.23	0.07	0.31	-0.02	-0.01
65	Vehicle	0.29	0.79	0.48	0.00	0.15	0.07	-0.08
66	Virus	0.52	0.42	0.07	0.13	0.30	0.07	0.59
67	Vulture	0.86	0.19	-0.02	0.01	-0.44	-0.11	0.02
68	Wheat	0.85	0.10	-0.05	-0.45	-0.14	0.13	-0.02

Appendix 4.2 Dendrogram using Ward method of hierarchical cluster analysis



Appendix 4.3 Card sort data matrix using Ward method of hierarchical cluster analysis¹³

Case number	Cluster number	ID label	Ecosystems																												Habitats																												Biomes																												Climates																												Geographies																												Resources																												Pollutants																												Organisms																												Interactions																												Processes																												Cycles																												Flows																												Energy																												Matter																												Information																												Behavior																												Cognition																												Emotion																												Consciousness																												Intelligence																												Culture																												Vulture																												Wheat																																																																																																																																																																																																																																																																																																																																																																																																																																										
			Airplane	Air/wind	Airport	Ants	Apple	Bacteria	Baldrige	Bass	Bear	Buildings	Cabbage	Cat	Cattle	Cauliflower	Cockroach	Corn	Creek	Crow	Deer	Desert	Dog	Earthworm	Factories	Forest	Frog	Grape	Grass	Grasshopper	Herbs	Human/people	Kudzu	Lake	Landfill	Moss/lichen	Mountain	National park	Neighborhood	Ocean	Park	Pond	Prairie	Railway station	Railway/train	Rain	River	Roads	Rocks	Salmon	Sand	Savannah	Sea	Shark	Shopping mall	Shrimp	Shrub	Snail	Soil	Sparrow	Spider	Squirrel	Stone	Sun	Swamp	Trees	Vehicle	Virus	Vulture	Wheat																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
45	1	68 - L/BF/>60yrs/5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1</

¹³ Cluster rows are color coded. Cluster-1 yellow, Cluster-2 pink, Cluster-3 gray, & Outliers O - white. To differentiate clusters, especially Clusters 2 and 3, card sort items are color coded. Yellow – built; Pink – microorganisms, White – natural, gray - human. Cards sorted environment is coded 1, otherwise coded 0.

Appendix 4.4 Cluster Membership Distribution

Cluster membership distribution by level of activism

Level of activism	Clusters				Total
	Cluster 1	Cluster 2	Cluster 3	Outliers	
Activist environmentalist	10	0	0	0	10
Passive member/ Sc.&Env. Professional	16	4	2	0	22
Layperson/Not a member	29	3	6	6	44
Total	55	7	8	6	76

Cluster membership distribution by ethnicity

Ethnicity	Clusters				Total
	Cluster 1	Cluster 2	Cluster 3	Outliers	
Black/Afro-American	17	3	6	5	31
White/Euro-American	38	4	2	1	45
Total	55	7	8	6	76

Cluster membership distribution by sex

Sex	Clusters				Total
	Cluster 1	Cluster 2	Cluster 3	Outliers	
Female	30	2	3	2	37
Male	25	5	5	4	39
Total	55	7	8	6	76

Cluster membership distribution by age group

Age group	Clusters				Total
	Cluster 1	Cluster 2	Cluster 3	Outliers	
20-40 Years	18	3	3	1	25
40-60 Years	21	3	4	1	29
>60 Years	16	1	1	4	22
Total	55				76

Cluster membership distribution by level of education

Level of education	Clusters				Total
	Cluster 1	Cluster 2	Cluster 3	Outliers	
Below undergraduate	18	3	2	5	28
Undergraduate	15	1	5	1	22
Above undergraduate	22	3	1	0	26
Total	55				76

Appendix 4.5 ANOVA and LSD t-test results for environmental orientation by level of activism

Sl.	Particulars	ANOVA		LSD t-test (p values)		
		F	p	AC v NP	AC v LP	NP v LP
1	Ecosystem orientation	18.34	0.000	0.000	0.000	0.081
2	Environmental state orientation	33.27	0.000	0.152	0.000	0.000
3	Envt. protection orientation/attitude	27.73	0.000	0.080	0.000	0.000

AC = ACTV, NP = NM/PF, LP = LAYP

Appendix 4.6 Frequency Distribution of Environmental Information Sources

Sl.	Source	ACTV	NM/PF	LAYP	Total
1	Academic	1	1	0	2
2	Family	0	1	6	7
3	Friends	1	5	8	14
4	Internet/email	2	2	1	5
5	Magazines	1	2	4	7
6	Media	0	0	3	3
7	Newspaper	1	4	18	23
8	Personal experience	2	0	1	3
9	Radio	0	1	3	4
10	Read	1	3	2	6
11	TV	2	4	21	27
12	Work	0	2	1	3
13	Others	1	0	2	3
	Total	12	25	70	107

Note: The frequency table is based on responses from 46 participants. Because of multiple responses the total exceeds 46.

Appendix 4.7 ANOVA and LSD t-test results for ethical orientation by level of activism

Sl.	Particulars	ANOVA		LSD t-test (p values)		
		F	p	AC v NP	AC v LP	NP v LP
1	Religious	1.36	0.263	0.475	0.120	0.368
2	Stewardship	Nr	nr	nr	nr	nr
3	Communalism	1.22	0.302	0.342	0.125	0.575
4	Humane treatment	0.43	0.650	0.518	0.355	0.813

nr – ANOVA & LSD test not run, AC = ACTV, NP = NM/PF, LP = LAYP

Appendix 4.8 Frequency distribution of religion based ethics by level of activism

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Wildlife	1	1	7	9
2	Logging (sawing a tree)		2	4	6
3	Arid area		1	2	3
4	Cattle pasture		1	1	2
5	Forest			2	2
6	Stream		1	1	2
7	Chicken houses			1	1
8	Dam			1	1
9	Sub-division			1	1
10	Strip mall			1	1
11	Wetland			1	1
	Column total	1	6	22	29
	Sample size (Ni)	12	19	41	72

Note: A participant can invoke the basis multiple times across the scenes. The column total is simply the frequency count of the basis, not the number of participants. For percent of participants invoking the basis see Table 4.9.

Appendix 4.9 Frequency distribution of stewardship ethics by level of activism

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Wildlife	2	1	6	9
2	Logging (sawing a tree)	1	2	2	5
3	Forest			1	1
4	Stream		1		1
5	Wetland			1	1
	Column total	3	4	10	17
	Sample size (Ni)	12	19	41	72

Note: A participant can invoke the basis multiple times across the scenes. The column total is simply the frequency count of the basis, not the number of participants. For percent of participants invoking the basis see Table 4.9.

Appendix 4.10 Frequency distribution of communalism ethics by level of activism

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Wildlife	3	4	7	14
2	Logging (sawing a tree)	1	1	1	3
3	Forest	1			1
	Column total	5	5	8	18
	Sample size (Ni)	12	19	41	72

Note: A participant can invoke the basis multiple times across the scenes. The column total is simply the frequency count of the basis, not the number of participants. For percent of participants invoking the basis see Table 4.9.

Appendix 4.11 ANOVA and LSD t-test results for value orientation by level of activism

Sl	Values	Score mean				ANOVA		LSD t-test (p values)		
		ACTV	NM/PF	LAYP	Total	F	p	AC v NP	AC v LP	NP v LP
1	Consumptive	10.67	11.26	11.12	11.08	0.31	0.736	0.447	0.514	0.811
2	Beauty/pleasing to eyes	3.25	4.05	5.00	4.46	3.79	0.027	0.298	0.012	0.105
3	Ecological	6.00	3.53	2.46	3.33	11.38	0.000	0.004	0.000	0.096
3	Psycho-spiritual	1.08	0.84	0.90	0.92	0.25	0.777	0.489	0.560	0.818
4	Ugly	1.33	1.53	1.00	1.19	0.97	0.383	0.712	0.474	0.183
5	Recreational	1.33	1.42	0.59	0.93	5.37	0.007	0.818	0.030	0.005
7	Negative	4.33	2.05	0.49	1.54	30.70	0.000	0.000	0.000	0.000
8	Intrinsic	1.00	0.84	0.41	0.63	3.26	0.044	0.604	0.033	0.065
9	Religious	0.08	0.37	0.80	0.57	1.92	0.155	0.534	0.080	0.208
10	Heritage	0.42	0.16	0.20	0.22	nr	nr	nr	nr	nr
11	Medicinal	0.33	0.11	0.05	0.11	nr	nr	nr	nr	nr
12	Educational/scientific	0.25	0.16		0.08	nr	nr	nr	nr	nr

nr – ANOVA/LSD not run, AC = ACTV, NP = NM/PF, LP = LAYP

Appendix 4.12 Environmental value association by environmental forms

(frequency count)

Sl	Values	Agriculture	Arid area	Cattle pasture	Chicken houses	City	River dam	Forest	Factory	Highway/congestion	Landfill	Manicured lawn	Logging	Sub-division	Stream	Strip mall	Wetland	Wildlife	Total (count)	Total (Percent)
1	Consumptive	71	15	62	67	55	67	23	66	55	53	27	67	59	14	64	18	15	798	44.2
2	Beauty		40	17		24	14	42		2		46	15	9	57	4	28	23	321	17.8
3	Ecological	2	18	8	4	4	19	36		2	3	16	27	10	13	11	36	31	240	13.3
4	Negative				11	6	1		2	20	10	17	2	14	0	26	2		111	6.1
5	Ugly		3		3	2	3	0	14	6	15	8	1	15		13	3		86	4.8
6	Recreational		9				5	13							20		15	5	67	3.7
7	Psychospiritual		5	4		1	1	12		0			2		25		13	3	66	3.7
8	Intrinsic		8					4					26		2		1	4	45	2.5
9	Religious		5	2	2		3	3					6	1	4	2	4	9	41	2.3
10	Heritage	1	2	1		1		4					6					1	16	0.9
11	Medicinal		2					1			1		1				1	2	8	0.4
12	Science/Educl.		2					1					2					1	6	0.3
Column total		74	109	94	87	93	113	139	82	85	82	114	155	108	135	120	121	94	1805	100

Appendix 4.13 Distribution of beauty value by level of activism
(in percentage by environmental forms)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Stream	75.0	84.2	78.0	79.2
2	Manicured lawn	8.3	42.1	90.2	63.9
3	Forest	58.3	57.9	58.5	58.3
4	Arid area	50.0	52.6	58.5	55.6
5	Wetland	41.7	31.6	41.5	38.9
6	City	16.7	26.3	41.5	33.3
7	Wildlife	41.7	26.3	31.7	31.9
8	Cattle pasture	8.3	26.3	26.8	23.6
9	Logging (sawing a tree)	25.0	36.8	12.2	20.8
10	Dam		15.8	26.8	19.4
11	Sub-division			22.0	12.5
12	Strip mall		5.3	7.3	5.6
13	Highway/traffic congestion			4.9	2.8
	Sample size (Ni)	12	19	41	72

Appendix 4.14 Distribution of ecological value by level of activism
(in percentage by environmental forms)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Forest	58.3	47.4	48.8	50.0
2	Wetland	83.3	63.2	34.1	50.0
3	Wildlife	75.0	36.8	36.6	43.1
4	Logging (sawing a tree)	66.7	26.3	34.1	37.5
5	Dam	50.0	31.6	17.1	26.4
6	Arid area	58.3	31.6	12.2	25.0
7	Manicured lawn	33.3	26.3	17.1	22.2
8	Stream	50.0	15.8	9.8	18.1
9	Strip mall	16.7	21.1	12.2	15.3
10	Sub-division	16.7	10.5	14.6	13.9
11	Cattle pasture	33.3	10.5	4.9	11.1
12	Chicken houses	8.3	10.5	2.4	5.6
13	City	16.7	10.5		5.6
14	Landfill	16.7		2.4	4.2
15	Agriculture		10.5		2.8
16	Highway/traffic congestion	16.7			2.8
17	Factory				
	Average	40.00	25.19	18.95	20.83
	Sample size (Ni)	12	19	41	72

Appendix 4.15 Distribution of negative value by level of activism
(in percentage by environmental forms)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Manicured lawn	83.3	31.6	2.4	23.6
2	Strip mall	75.0	63.2	12.2	36.1
3	Highway/traffic congestion	66.7	47.4	7.3	27.8
4	Landfill	58.3	15.8		13.9
5	Sub-division	50.0	21.1	9.8	19.4
6	Chicken houses	50.0	10.5	7.3	15.3
7	City	25.0	10.5	2.4	8.3
8	Logging (sawing a tree)	16.7			2.8
9	Factory	8.3		2.4	2.8
10	Dam		5.3		1.4
11	Wetland			4.9	2.8
	Sample size (Ni)	12	19	41	72

Appendix 4.16 Distribution of intrinsic/existence value by level of activism
(in percentage by environmental forms)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Logging (sawing a tree)	66.7	47.4	22.0	36.1
2	Arid area	16.7	10.5	9.8	11.1
3	Forest	8.3	10.5	2.4	5.6
4	Wildlife	8.3	15.8		5.6
5	Stream			4.9	2.8
6	Wetland			2.4	1.4
	Sample size (Ni)	12	19	41	72

Appendix 4.17 Distribution of religious value by level of activism
(in percent by environmental forms)

Sl	Environmental forms/scenes	Level of activism			Total
		ACTV	NM/PF	LAYP	
1	Wildlife	8.3	5.3	17.1	12.5
2	Logging (sawing a tree)		10.5	9.8	8.3
3	Arid area		5.3	9.8	6.9
4	Stream		5.3	7.3	5.6
5	Wetland			9.8	5.6
6	River dam		5.3	4.9	4.2
7	Forest			7.3	4.2
8	Cattle pasture		5.3	2.4	2.8
9	Chicken houses			4.9	2.8
10	Strip mall			4.9	2.8
11	Sub-division			2.4	1.4
	Sample size (Ni)	12	19	41	72

Appendix 4.18 ANOVA and LSD t-test results for socio-economic-political ramification themes by level of activism

Sl	Themes	Score mean				ANOVA		LSD t-test (p values)		
		ACTV	NM/PF	LAYP	Total	F	p	AC v NP	AC v LP	NP v LP
1	Political, governance & policy	1.33	1.89	0.51	1.01	11.52	0.000	0.158	0.022	0.000
2	Socioeconomic inequity & exploitation	0.92	0.37	0.17	0.35	7.1	0.002	0.016	0.000	0.242
3	Economy & creation of job	1.17	1.63	1.56	1.51	0.31	0.734	0.462	0.483	0.882
4	Out of business & Loss of job	1	0.37	0.27	0.42	4.76	0.012	0.021	0.003	0.621
5	Sprawl and growth	3.5	1.58	0.44	1.25	20.96	0.000	0.001	0.000	0.006
6	Economics over environment /community	1.25	0.89	0.54	0.75	2.45	0.094	0.356	0.040	0.218
7	Excessive use of resources	4.17	1.74	0.73	1.57	22.72	0.000	0.000	0.000	0.023
8	Wasteful	2.17	1.58	0.54	1.08	13.29	0.000	0.145	0.000	0.001
9	Population growth & overpopulation	0.58	0.32	0.29	0.35	0.74	0.479	0.329	0.234	0.910
10	Socio-cultural decay or degradation	1.42	0.63	0.49	0.68	4.38	0.016	0.030	0.004	0.591
Sample size (Ni)		12	19	41	72					

AC = ACTV, NP = NM/PF, LP = LAYP

Appendix 4.19 Socio-economic-political ramification theme association by environmental forms

(frequency count)

Sl	Values	Agriculture	Arid area	Cattle pasture	Chicken house	City	River dam	Forest	Factory	Highway	Landfill	Manicured lawn	Logging	Sub-division	Stream	Strip mall	Wetland	Wildlife	Total (count)	Total (Percent)
1	Excessive use of resources	8	1	6	8	15	3	1	3	13	14	19	6	6		10			113	17.5
2	Economy & creation of job	7	1	4	13	17	3	1	17	6	5	4	9	8		12	1	1	109	16.9
3	Sprawl, growth and development		3	5		13	3	5	1	11	1	3	3	14	3	9	7	9	90	13.9
4	Wasteful of resources	3		1		8	5	2	4	6	22	11	4	1		11			78	12.1
5	Political/governance/policy	2		1	2	3	7	4	10	8	7	2	11	6		6	2	2	73	11.3
6	Economics over envt/community	3		2	7	1	1	3	6		1	1	14	6	1	5	2	1	54	8.4
7	Socio-cultural degradation	2			1	15	1		1	9		8	1	6		5			49	7.6
8	Out of business & Loss of job	7		3	3	1				2				1		13			30	4.6
9	Socio-econ. Inequity & exploitation	2		1	2	6	3	2	1	1		1		2	1	3			25	3.9
10	Population growth & over population	1	3	1	3	4	1		1	1	2			5		1		2	25	3.9
Column total		35	8	24	39	83	27	18	44	57	52	49	48	55	5	75	12	15	646	100

Appendix 4.20 Groups score means, and ANOVA for environmental orientation by ethnicity

Sl	Themes	Percent			Score mean			F	p
		Black	White	Total	Black	White	Total		
1	Ecosystem orientation	69.2	86.7	75.6	3.08	2.80	2.98	0.10	0.754
2	Envtl. state orientation	100.0	100.0	100.0	9.50	10.40	9.83	0.67	0.418
3	Envt. Protection orientation	88.5	93.3	90.2	4.73	6.60	5.41	2.67	0.110
4	Religious (ethics)	38.5	26.7	34.1	0.69	0.27	0.54	1.75	0.194
5	Communalism (ethics)	23.1	13.3	19.5	0.23	0.13	0.20	nr	nr
6	Stewardship (ethics)	15.4	20.0	17.1	0.23	0.27	0.24	nr	nr
7	Humane treatment (animal)	34.6	60.0	43.9	0.38	0.67	0.49	2.19	0.147
Sample size (Ni)		26	15	41					

nr – ANOVA not run

Appendix 4.21 Distribution of ecosystem orientation by ethnicity (in percent by environmental forms)

Sl	Environmental forms/scenes	Ethnicity		Total
		Black	White	
1	Forest	46.2	53.3	48.8
2	Wildlife	42.3	40.0	41.5
3	Logging (sawing a tree)	42.3	33.3	39.0
4	Wetland	30.8	46.7	36.6
5	Strip mall	23.1	20.0	22.0
6	River dam	15.4	20.0	17.1
7	Manicured lawn	15.4	20.0	17.1
8	Sub-division	26.9		17.1
9	Arid area	11.5	13.3	12.2
10	Chicken houses	7.7	20.0	12.2
11	Stream	11.5	13.3	12.2
12	Landfill	15.4		9.8
13	Cattle pasture	7.7		4.9
14	City	3.8		2.4
15	Factory	3.8		2.4
16	Highway/traffic congestion	3.8		2.4
17	Agriculture			
Sample size (Ni)		26	15	41

Appendix 4.22 Distribution of environmental state orientation by ethnicity
(in percent by environmental forms)

Sl	Environmental forms/scenes	Ethnicity		Total
		Black	White	
1	Factory	100.0	93.3	97.6
2	Landfill	96.2	93.3	95.1
3	Highway/traffic congestion	100.0	80.0	92.7
4	Logging (sawing a tree)	80.8	100.0	87.8
5	City	84.6	73.3	80.5
6	Wildlife	65.4	66.7	65.9
7	Forest	61.5	66.7	63.4
8	Strip mall	57.7	66.7	61.0
9	Sub-division	38.5	80.0	53.7
10	Wetland	38.5	66.7	48.8
11	Agriculture	38.5	60.0	46.3
12	Stream	46.2	40.0	43.9
13	River dam	34.6	46.7	39.0
14	Manicured lawn	34.6	33.3	34.1
15	Chicken houses	23.1	40.0	29.3
16	Arid area	26.9	20.0	24.4
17	Cattle pasture	23.1	13.3	19.5
Sample size (Ni)		26	15	41

Appendix 4.23 Distribution of Environmental protection orientation by ethnicity
(in percent by environmental forms)

Sl	Environmental forms/scenes	Ethnicity		Total
		Black	White	
1	Logging (sawing a tree)	69.2	66.7	68.3
2	Wildlife	69.2	66.7	68.3
3	Landfill	53.8	80.0	63.4
4	Factory	42.3	53.3	46.3
5	Sub-division	26.9	60.0	39.0
6	Strip mall	26.9	53.3	36.6
7	Forest	26.9	40.0	31.7
8	Highway/traffic congestion	19.2	46.7	29.3
9	Wetland	23.1	40.0	29.3
10	Stream	26.9	26.7	26.8
11	City	19.2	26.7	22.0
12	Agriculture	7.7	33.3	17.1
13	River dam	11.5	26.7	17.1
14	Manicured lawn	19.2	13.3	17.1
15	Arid area	11.5	13.3	12.2
16	Cattle pasture	15.4	0.0	9.8
17	Chicken houses	3.8	13.3	7.3
Sample size (Ni)		26	15	41

Appendix 4.24 Groups score means, and ANOVA for value orientation by ethnicity

Sl	Values	Percent			Score mean			F	p
		Black	White	Total	Black	White	Total		
1	Consumptive value	100.0	100.0	100.0	11.38	10.67	11.12	1.02	0.319
2	Beauty – pleasing to the eyes	100.0	100.0	100.0	4.77	5.40	5.00	0.67	0.418
3	Ecological value	69.2	73.3	70.7	2.50	2.40	2.46	0.02	0.894
4	Psychospiritual value	57.7	66.7	61.0	0.88	0.93	0.90	0.03	0.864
5	Ugly	46.2	66.7	53.7	0.69	1.53	1.00	4.43	0.042
6	Recreational value	26.9	73.3	43.9	0.31	1.07	0.59	9.51	0.004
7	Religious value	46.2	33.3	41.5	0.96	0.53	0.80	0.79	0.381
8	Intrinsic value	34.6	40.0	36.6	0.35	0.53	0.41	0.83	0.367
9	Negative value	15.4	46.7	26.8	0.19	1.00	0.49	5.50	0.024
10	Heritage value	15.4	20.0	17.1	0.15	0.27	0.20	nr	nr
11	Medicinal	3.8	0.0	2.4	0.08	0.00	0.05	nr	nr
Sample size (Ni)		26	15	41					

nr – ANOVA not run

Appendix 4.25 Groups score means, ANOVA for environmental orientation by gender

Sl	Themes	Percent			Score mean			F	p
		Female	Male	Total	Female	Male	Total		
1	Ecosystem orientation	63.2	86.4	75.6	1.95	3.86	2.98	5.85	0.020
2	Envtl. state orientation	100	100	100	8.32	11.14	9.83	8.44	0.006
3	Envtl. protection orientation	89.5	90.9	90.2	4.58	6.14	5.41	1.96	0.170
4	Religious (ethics)	31.6	36.4	34.1	0.42	0.64	0.54	0.46	0.500
5	Communalism (ethics)	15.8	22.7	19.5	0.16	0.23	0.2	nr	nr
6	Stewardship (ethics)	10.5	22.7	17.1	0.11	0.36	0.24	nr	nr
7	Humane treatment (animal)	52.6	36.4	43.9	0.58	0.41	0.49	0.82	0.370
Sample size (Ni)		19	22	41					

nr – ANOVA not run

Appendix 4.26 Distribution of ecosystem orientation by gender (in percent by environmental forms)

Sl	Environmental forms/scenes	Sex		Total
		Female	Male	
1	Forest	31.6	63.6	48.8
2	Wildlife	36.8	45.5	41.5
3	Logging (sawing a tree)	31.6	45.5	39.0
4	Wetland	26.3	45.5	36.6
5	Strip mall	15.8	27.3	22.0
6	River dam	10.5	22.7	17.1
7	Manicured lawn	21.1	13.6	17.1
8	Sub-division	10.5	22.7	17.1
9	Arid area	5.3	18.2	12.2
10	Chicken houses	5.3	18.2	12.2
11	Stream		22.7	12.2
12	Landfill		18.2	9.8
13	Cattle pasture		9.1	4.9
14	City		4.5	2.4
15	Factory		4.5	2.4
16	Highway/traffic congestion		4.5	2.4
17	Agriculture			
Sample size (Ni)		19	22	41

Appendix 4.27 Distribution of environmental state orientation by gender
(in percent by environmental forms)

Sl	Environmental forms/scenes	Sex		Total
		Female	Male	
1	Factory	94.7	100.0	97.6
2	Landfill	89.5	100.0	95.1
3	Highway/traffic congestion	89.5	95.5	92.7
4	Logging (sawing a tree)	78.9	95.5	87.8
5	City	68.4	90.9	80.5
6	Wildlife	52.6	77.3	65.9
7	Forest	52.6	72.7	63.4
8	Strip mall	52.6	68.2	61.0
9	Sub-division	42.1	63.6	53.7
10	Wetland	31.6	63.6	48.8
11	Agriculture	47.4	45.5	46.3
12	Stream	31.6	54.5	43.9
13	River dam	31.6	45.5	39.0
14	Manicured lawn	36.8	31.8	34.1
15	Chicken houses	15.8	40.9	29.3
16	Arid area	10.5	36.4	24.4
17	Cattle pasture	5.3	31.8	19.5
Sample size (Ni)		19	22	41

Appendix 4.28 Distribution of environmental protection orientation by gender
(in percent by environmental forms)

Sl	Environmental forms/scenes	Sex		Total
		Female	Male	
1	Wildlife	57.9	77.3	68.3
2	Logging (sawing a tree)	63.2	72.7	68.3
3	Landfill	63.2	63.6	63.4
4	Factory	31.6	59.1	46.3
5	Sub-division	42.1	36.4	39.0
6	Strip mall	36.8	36.4	36.6
7	Forest	21.1	40.9	31.7
8	Wetland	21.1	36.4	29.3
9	Highway/traffic congestion	21.1	36.4	29.3
10	Stream	21.1	31.8	26.8
11	City	10.5	31.8	22.0
12	Manicured lawn	21.1	13.6	17.1
13	River dam	21.1	13.6	17.1
14	Agriculture	10.5	22.7	17.1
15	Arid area	5.3	18.2	12.2
16	Cattle pasture	10.5	9.1	9.8
17	Chicken houses	0.0	13.6	7.3
Sample size (Ni)		19	22	41

Appendix 4.29 Groups score means, and ANOVA for value orientation by ethnicity

Sl	Themes	Percent			Score mean			F	p
		Female	Male	Total	Female	Male	Total		
1	Beauty - pleasing to the eyes	100.0	100.0	100.0	6.0	4.14	5.00	7.32	0.010
2	Consumptive value	100.0	100.0	100.0	10.3	11.86	11.12	6.13	0.018
3	Ecological value	57.9	81.8	70.7	1.7	3.09	2.46	3.85	0.057
4	Psychospiritual value	73.7	50.0	61.0	1.2	0.68	0.90	3.30	0.077
5	Ugly	68.4	40.9	53.7	1.3	0.73	1.00	2.20	0.146
6	Recreational value	52.6	36.4	43.9	0.6	0.55	0.59	0.11	0.747
7	Religious/spiritual value	42.1	40.9	41.5	0.8	0.77	0.80	0.02	0.884
8	Intrinsic value	36.8	36.4	36.6	0.4	0.45	0.41	0.19	0.669
9	Negative value	26.3	27.3	26.8	0.5	0.50	0.49	0.01	0.941
10	Heritage value	0.0	31.8	17.1	0.0	0.36	0.20	nr	nr
11	Medicinal	0.0	4.5	2.4	0.0	0.09	0.05	nr	nr
Sample size (Ni)		26	15	41					

nr – ANOVA not run

Appendix 4.30 Groups score means, and ANOVA for environmental orientation by ethnicity

Sl	Themes	Percent of participants				Score means				ANOVA	LSD t-test
		20-40 years	40-60 years	>60 years	Total	20-40 years	40-60 years	>60 years	Total	F, p	
1	Ecosystem orientation	84.6	68.8	75.0	75.6	2.92	2.31	4.00	3.00	1.40, 0.256	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 *
2	Environmental state orientation	100.0	100.0	100.0	100.0	9.62	9.88	10.00	9.83	0.04, 0.960	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
3	Envt. protection orientation	100.0	87.5	83.3	90.2	5.31	5.06	6.00	5.41	0.23, 0.794	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
4	Religious (ethics)	46.2	25.0	33.3	34.1	0.77	0.38	0.50	0.54	0.55, 0.580	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
6	Communalism (ethics)	23.1	25.0	8.3	19.5	0.23	0.25	0.08	0.20	nr	nr
5	Stewardship (ethics)	30.8	6.3	16.7	17.1	0.46	0.06	0.25	0.24	nr	nr
7	Humane treatment (animal)	53.8	37.5	41.7	43.9	0.69	0.38	0.42	0.49	1.14, 0.330	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
Sample size (Ni)		13	16	12	41						

* - significant at $p < 0.10$, ns – not significant, nr – test not run, v – versus

Appendix 4.31 Distribution of ecosystem orientation by age
(in percent by environmental forms)

Sl	Environmental forms/scenes	Age			Total
		20-40yrs	40-60yrs	>60yrs	
1	Forest	38.5	43.8	66.7	48.8
2	Wildlife	30.8	31.3	66.7	41.5
3	Logging (sawing a tree)	46.2	31.3	41.7	39.0
4	Wetland	38.5	31.3	41.7	36.6
5	Strip mall	23.1	12.5	33.3	22.0
6	River dam	15.4	25.0	8.3	17.1
7	Manicured lawn	15.4	12.5	25.0	17.1
8	Sub-division	15.4	12.5	25.0	17.1
9	Arid area	7.7	6.3	25.0	12.2
10	Chicken houses	23.1		16.7	12.2
11	Stream	7.7	12.5	16.7	12.2
12	Landfill	7.7	12.5	8.3	9.8
13	Cattle pasture	7.7		8.3	4.9
14	City			8.3	2.4
15	Factory			8.3	2.4
16	Highway/traffic congestion	7.7			2.4
17	Agriculture				
Sample size (Ni)		13	16	12	41

Appendix 4.32 Distribution of environmental state orientation by age
(in percent by environmental forms)

Sl	Environmental forms/scenes	Age			Total
		20-40yrs	40-60yrs	>60yrs	
1	Factory	92.3	100.0	100.0	97.6
2	Landfill	84.6	100.0	100.0	95.1
3	Highway/traffic congestion	76.9	100.0	100.0	92.7
4	Logging (sawing a tree)	92.3	93.8	75.0	87.8
5	City	76.9	81.3	83.3	80.5
6	Wildlife	53.8	68.8	75.0	65.9
7	Forest	61.5	56.3	75.0	63.4
8	Strip mall	69.2	50.0	66.7	61.0
9	Sub-division	53.8	56.3	50.0	53.7
10	Wetland	61.5	43.8	41.7	48.8
11	Agriculture	46.2	56.3	33.3	46.3
12	Stream	38.5	31.3	66.7	43.9
13	River dam	46.2	43.8	25.0	39.0
14	Manicured lawn	30.8	37.5	33.3	34.1
15	Chicken houses	23.1	37.5	25.0	29.3
16	Arid area	30.8	18.8	25.0	24.4
17	Cattle pasture	23.1	12.5	25.0	19.5
Sample size (Ni)		13	16	12	41

Appendix 4.33 Distribution of environmental protection orientation by age
(in percent by environmental forms)

Sl	Environmental forms/scenes	Age			Total
		20-40yrs	40-60yrs	>60yrs	
1	Logging (sawing a tree)	76.9	62.5	66.7	68.3
2	Wildlife	84.6	50.0	75.0	68.3
3	Landfill	69.2	62.5	58.3	63.4
4	Factory	46.2	43.8	50.0	46.3
5	Sub-division	38.5	37.5	41.7	39.0
6	Strip mall	38.5	31.3	41.7	36.6
7	Forest	38.5	18.8	41.7	31.7
8	Highway/traffic congestion	15.4	31.3	41.7	29.3
9	Wetland	15.4	31.3	41.7	29.3
10	Stream	23.1	25.0	33.3	26.8
11	City	23.1	18.8	25.0	22.0
12	Agriculture	15.4	25.0	8.3	17.1
13	River dam	7.7	25.0	16.7	17.1
14	Manicured lawn	7.7	25.0	16.7	17.1
15	Arid area	23.1	6.3	8.3	12.2
16	Cattle pasture		12.5	16.7	9.8
17	Chicken houses	7.7		16.7	7.3
Sample size (Ni)		13	16	12	41

Appendix 4.34 Groups score means, and ANOVA results for value orientations by age

Sl	Value	Percent				Mean				ANOVA	LSD t-test
		20-40 years	40-60 years	>60 years	Total	20-40 years	40-60 years	>60 years	Total	F, p	
1	Beauty - pleasing to the eyes	100.0	100.0	100.0	100.0	5.62	5.06	4.25	5.00	1.05, 0.360	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
2	Consumptive value	100.0	100.0	100.0	100.0	11.23	10.63	11.58	11.10	0.79, 0.462	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
3	Ecological value	69.2	68.8	75.0	70.7	1.92	2.19	3.42	2.46	1.57, 0.221	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
4	Psychospiritual value	76.9	62.5	41.7	61.0	1.08	1.06	0.50	0.90	1.94, 0.157	20-40 v 40-60 ns 20-40 v >60 * 40-60 v >60 *
5	Ugly	76.9	56.3	25.0	53.7	1.92	0.81	0.25	1.00	7.34, 0.002	20-40 v 40-60 ** 20-40 v >60 *** 40-60 v >60 ns
6	Recreational value	76.9	37.5	16.7	43.9	1.15	0.44	0.17	0.59	5.94, 0.006	20-40 v 40-60 ** 20-40 v >60 *** 40-60 v >60 **
7	Religious value	46.2	37.5	41.7	41.5	1.00	0.88	0.50	0.80	0.37, 0.693	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
8	Intrinsic value	69.2	25.0	16.7	36.6	0.85	0.25	0.17	0.41	5.52, 0.008	20-40 v 40-60 *** 20-40 v >60 *** 40-60 v >60 ns
9	Negative value	38.5	25.0	16.7	26.8	1.08	0.25	0.17	0.49	2.90, 0.067	20-40 v 40-60 ** 20-40 v >60 ** 40-60 v >60 ns
10	Heritage value	23.1	12.5	16.7	17.1	0.31	0.13	0.17	0.20	nr	nr
11	Medicinal	7.7	0.0	0.0	2.4	0.15	0.00	0.00	0.05	nr	nr
Sample size (Ni)		13	16	12	41						

*** - p<0.01, ** - p<0.05, * - p<0.10, ns – not significant, nr – ANOVA/LSD test not run

Appendix 4.35 Frequency distribution of environmental value for layperson sample

Sl	Values	Agriculture	Arid area	Cattle pasture	Chicken houses	City	River dam	Forest	Factory	Highway/congestion	Landfill	Manicured lawn	Logging	Sub-division	Stream	Strip mall	Wetland	Wildlife	Total (count)	Total (percent)
1	Consumptive	40	6	34	38	28	38	15	36	30	29	18	38	38	9	40	9	10	456	48.3
2	Beauty		24	11		17	11	24		2		37	5	9	32	3	17	13	205	21.7
3	Ecological		5	2	1		7	20			1	7	14	6	4	5	14	15	101	10.7
4	Ugly		3		2	2	2		5	1	8	3	1	6		5	3		41	4.3
5	Psychospiritual		1	1		1	1	5					2		15		8	3	37	3.9
6	Spiritual		4	1	2		2	3					4	1	3	2	4	7	33	3.5
7	Recreational		2				2	4							6		8	2	24	2.5
8	Negative				3	1			1	3		1		4	0	5	2		20	2.1
9	Intrinsic		4					1					9		2		1		17	1.8
10	Heritage	1	1	1				1					3					1	8	0.8
11	Medicinal							1					1						2	0.2
12	Science/Eduatl.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Column total		41	50	50	46	49	63	74	42	36	38	66	77	64	71	60	66	51	944	100

Appendix 4.36 Groups score means, and ANOVA results for environmental orientations by education

Sl	Themes	Percent of Ni				Score means				ANOVA	LSD t-test
		<UG	UG	>UG	Total	<UG	UG	>UG	Total	F, p	
1	Ecosystem orientation	72.7	81.8	75.0	75.6	3.36	2.27	2.88	2.98	0.60, 0.552	<UG v UG ns <UG v >UG ns UG v >UG ns
2	Envtl. state orientation	100.0	100.0	100.0	100.0	9.91	9.09	10.63	9.83	0.48, 0.623	<UG v UG ns <UG v >UG ns UG v >UG ns
3	Envtl. protection orientation	86.4	100.0	87.5	90.2	4.50	6.45	6.50	5.41	1.58, 0.220	<UG v UG ns <UG v >UG ns UG v >UG ns
4	Religious (ethics)	36.4	36.4	25.0	34.1	0.68	0.45	0.25	0.54	0.58, 0.564	<UG v UG ns <UG v >UG ns UG v >UG ns
6	Communalism (ethics)	22.7	18.2	12.5	19.5	0.23	0.18	0.13	0.20	nr	nr
5	Stewardship (ethics)	13.6	9.1	37.5	17.1	0.18	0.09	0.63	0.24	nr	nr
7	Humane treatment (animal)	40.9	45.5	50.0	43.9	0.45	0.45	0.63	0.49	0.25, 0.778	<UG v UG ns <UG v >UG ns UG v >UG ns
Sample size (Ni)		22	11	8	41						

ns – not significant, nr – ANOVA/LSD t-test not run, UG – undergraduate, v - versus

Appendix 4.37 Distribution of ecosystem orientation by education
(in percent by environmental forms)

Sl	Environmental forms/scenes	Education			Total
		<UG	UG	>UG	
1	Forest	50.0	45.5	50.0	48.8
2	Wildlife	40.9	45.5	37.5	41.5
3	Logging (sawing a tree)	50.0	27.3	25.0	39.0
4	Wetland	31.8	36.4	50.0	36.6
5	Strip mall	22.7	27.3	12.5	22.0
6	River dam	27.3	9.1		17.1
7	Manicured lawn	9.1	18.2	37.5	17.1
8	Sub-division	27.3	0.0	12.5	17.1
9	Arid area	18.2	0.0	12.5	12.2
10	Chicken houses	4.5	9.1	37.5	12.2
11	Stream	22.7	0.0	0.0	12.2
12	Landfill	13.6	9.1	0.0	9.8
13	Cattle pasture	4.5		12.5	4.9
14	City	4.5			2.4
15	Factory	4.5			2.4
16	Highway/traffic congestion	4.5			2.4
17	Agriculture				
Sample size (Ni)		22	11	8	41

Appendix 4.38 Distribution of environmental state orientation by education
(in percent by environmental forms)

Sl.	Environmental forms/scenes	Education			Total
		<UG	UG	>UG	
1	Factory	100.0	90.9	100.0	97.6
2	Landfill	100.0	90.9	87.5	95.1
3	Highway/traffic congestion	100.0	81.8	87.5	92.7
4	Logging (sawing a tree)	77.3	100.0	100.0	87.8
5	City	86.4	63.6	87.5	80.5
6	Wildlife	59.1	81.8	62.5	65.9
7	Forest	68.2	54.5	62.5	63.4
8	Strip mall	54.5	63.6	75.0	61.0
9	Sub-division	54.5	45.5	62.5	53.7
10	Wetland	45.5	45.5	62.5	48.8
11	Agriculture	45.5	45.5	50.0	46.3
12	Stream	45.5	36.4	50.0	43.9
13	River dam	45.5	36.4	25.0	39.0
14	Manicured lawn	31.8	36.4	37.5	34.1
15	Chicken houses	31.8	18.2	37.5	29.3
16	Arid area	27.3	18.2	25.0	24.4
17	Cattle pasture	18.2		50.0	19.5
Sample size (Ni)		22	11	8	41

Appendix 4.39 Distribution of environmental state orientation by education
(in percent by environmental forms)

Sl	Environmental forms/scenes	Education			Total
		<UG	UG	>UG	
1	Logging (sawing a tree)	63.6	72.7	75.0	68.3
2	Wildlife	63.6	63.6	87.5	68.3
3	Landfill	50.0	81.8	75.0	63.4
4	Factory	40.9	54.5	50.0	46.3
5	Sub-division	27.3	63.6	37.5	39.0
6	Strip mall	22.7	63.6	37.5	36.6
7	Forest	18.2	36.4	62.5	31.7
8	Highway/traffic congestion	22.7	45.5	25.0	29.3
9	Wetland	22.7	36.4	37.5	29.3
10	Stream	27.3	27.3	25.0	26.8
11	City	18.2	18.2	37.5	22.0
12	Agriculture	18.2	9.1	25.0	17.1
13	River dam	18.2	18.2	12.5	17.1
14	Manicured lawn	13.6	27.3	12.5	17.1
15	Arid area	9.1	18.2	12.5	12.2
16	Cattle pasture	4.5	9.1	25.0	9.8
17	Chicken houses	9.1		12.5	7.3
Sample size (Ni)		22	11	8	41

Appendix 4.40 Groups score means, and ANOVA results for value orientations by education

Sl	Values	Percent of Ni				Mean				ANOVA	LSD t-test
		<UG	UG	>UG	Total	<UG	UG	>UG	Total	F, p	
1	Beauty - pleasing to the eyes	100.0	100.0	100.0	100.0	4.86	5.55	4.63	5.00	0.42, 0.662	<UG v UG ns <UG v >UG ns UG v >UG ns
2	Consumptive value	100.0	100.0	100.0	100.0	11.09	10.73	11.75	11.12	0.50, 0.613	<UG v UG ns <UG v >UG ns UG v >UG ns
3	Ecological value	72.7	63.6	75.0	70.7	2.86	1.55	2.63	2.46	1.27, 0.294	<UG v UG ns <UG v >UG ns UG v >UG ns
4	Psychospiritual value	40.9	90.9	75.0	61.0	0.64	1.45	0.88	0.90	3.78, 0.032	<UG v UG *** <UG v >UG ns UG v >UG ns
5	Ugly	54.5	63.6	37.5	53.7	0.86	1.64	0.50	1.00	2.21, 0.124	<UG v UG ns <UG v >UG ns UG v >UG *
6	Recreational value	27.3	63.6	62.5	43.9	0.36	1.00	0.63	0.59	2.27, 0.117	<UG v UG ** <UG v >UG ns UG v >UG ns
7	Religious value	40.9	54.5	25.0	41.5	0.73	1.18	0.50	0.80	0.54, 0.588	<UG v UG ns <UG v >UG ns UG v >UG ns
8	Intrinsic value	27.3	54.5	37.5	36.6	0.27	0.55	0.63	0.41	1.25, 0.298	<UG v UG ns <UG v >UG ns UG v >UG ns
9	Negative value	22.7	27.3	37.5	26.8	0.23	1.00	0.50	0.49	1.81, 0.177	<UG v UG * <UG v >UG ns UG v >UG ns
10	Heritage value	18.2	9.1	25.0	17.1	0.18	0.09	0.38	0.20	nr	nr
11	Medicinal	0.0	9.1	0.0	2.4	0.00	0.18	0.00	0.05	nr	nr
Sample size (Ni)		22	11	8	41						

** - $p < 0.05$, * - $p < 0.10$, ns – not significant, nr – ANOVA/LSD test not run, UG – undergraduate, v - versus

Appendix 5.1 Percent distribution, score mean, and ANOVA results for environmental concern by level of activism

Particulars	Levels of activism				ANOVA	LSD t-test
	ACTV	NM/PF	LAYP	Total	F, p	
Groups score means	14.67	12.53	8.46	10.57	39.77, 0.000	AC v NP ** AC v LP *** NP v LP ***
% of participants (Ni) expressing environmental concern at least once during MTAT session	100	100	100	100		
Sample size (Ni)	12	19	41	72		

** - significant at $p < .05$; *** - significant at $p < .01$; AC – ACTV; NP – NM/PF; LP – LAYP; and v - versus

Appendix 5.2 Percent distribution, score mean, and ANOVA for environmental concern related themes by level of activism

Sl	Themes	Percent of Ni				Score mean				F	p
		ACTV	NM/PF	LAYP	Total	ACTV	NM/PF	LAYP	Total		
1	Degradation – simple	100.0	100.0	100.0	100.0	5.92	6.21	5.37	5.68	1.03	0.363
2	Degradation – complex	75.0	89.5	24.4	50.0	2.50	1.68	0.54	1.17	8.60	0.000
3	Phys. degradn. of landscape	91.7	89.5	78.0	83.3	2.33	2.68	1.66	2.04	3.29	0.043
4	Loss of wildlife & habitat	91.7	89.5	70.7	79.2	2.17	1.53	1.05	1.36	5.71	0.005
5	Ecosystem threat/alteration	83.3	68.4	41.5	55.6	3.50	1.21	0.71	1.31	18.61	0.000
6	Sprawl and growth	91.7	68.4	29.3	50.0	3.50	1.58	0.44	1.25	20.96	0.000
7	Loss of biodiversity	58.3	26.3	4.9	19.4	1.00	0.63	0.05	0.36	nr	nr
8	Loss of medicinal plants	33.3	10.5	2.4	9.7	0.33	0.11	0.05	0.11	nr	nr
9	Waste mgmt. and recycling	100.0	84.2	48.8	66.7	1.50	1.37	0.63	0.97	8.85	0.000
10	Excessive use	91.7	94.7	39.0	62.5	4.17	1.74	0.73	1.57	22.72	0.000
11	Wasteful	83.3	84.2	36.6	56.9	2.17	158.00	0.54	1.08	13.29	0.000
12	Need alternate methods/practice	75.0	84.2	39.0	56.9	2.08	1.47	0.51	1.03	12.75	0.000
13	Economics over envt./community	66.7	57.9	29.3	43.1	1.25	0.89	0.54	0.75	2.45	0.094
14	Efficient/less use of resource	58.3	42.1	26.8	36.1	0.83	0.74	0.46	0.60	0.96	0.387
15	Pop. growth/ overpopulation	25.0	31.6	26.8	27.8	0.58	0.32	0.29	0.35	0.74	0.479
16	Sustainability	66.7	15.8	2.4	16.7	1.00	0.16	0.02	0.22	nr	nr
Sample size (Ni)		12	19	41	72						

nr – test not run

Appendix 5.3 Percentage distribution, score mean, and ANOVA results for environmental concern by ethnicity

Particulars	Ethnicity		Total	F	p
	Black	White			
Groups score means	8.15	9.00	8.46	0.87	0.357
% of participants (Ni) expressing environmental concern at least once during MTAT session	100	100	100		
Sample size (Ni)	26	15	41		

ns – not significant

Appendix 5.4 Distribution of positive and negative environmental state association by ethnicity

(in percentage by environmental forms)

Sl	Environmental forms/scenes	Black		White	
		Negative	Positive	Negative	Positive
1	Logging (sawing a tree)	76.9	23.1	100.0	13.3
2	Factory	100.0		93.3	
3	Landfill	96.2		93.3	
4	Highway/traffic congestion	100.0		80.0	
5	City	84.6		73.3	
6	Sub-division	38.5	3.8	73.3	13.3
7	Strip mall	57.7		66.7	
8	Agriculture	38.5		60.0	6.7
9	Wildlife	46.2	26.9	60.0	13.3
10	River dam	30.8	7.7	40.0	13.3
11	Chicken houses	23.1	0.0	33.3	6.7
12	Forest	26.9	50.0	26.7	53.3
13	Manicured lawn	30.8	3.8	26.7	13.3
14	Stream	26.9	19.2	26.7	20.0
15	Wetland	15.4	26.9	26.7	46.7
16	Cattle pasture	15.4	11.5	13.3	
17	Arid area	7.7	19.2	6.7	13.3
	Average	11.3	11.3	12.5	12.5
	Sample size (Ni)	26		15	

Appendix 5.5 Percentage distribution, score mean, and ANOVA results for environmental concern-related themes

Sl	Themes	Percent of Ni			Score mean			F
		Black	White	Total	Black	White	Total	
1	Degradation - simple	100.0	100.0	100.0	5.54	5.07	5.37	0.44 ns
2	Degradation - complex	19.2	33.3	24.4	0.50	0.60	0.54	0.06 ns
3	Phys. degradation of landscape	73.1	86.7	78.0	1.58	1.80	1.66	0.21 ns
4	Loss of wildlife and habitat	65.4	80.0	70.7	0.88	1.33	1.05	2.2 ns
5	Ecosystem threat/alteration	42.3	40.0	41.5	0.69	0.73	0.71	0.01 ns
6	Sprawl and growth	23.1	40.0	29.3	0.35	0.60	0.44	1.02 ns
7	Loss of biodiversity	3.8	6.7	4.9	0.04	0.07	0.05	nr
8	Loss of medicinal plants	3.8		2.4	0.08		0.05	nr
9	Waste mgmt. & recycling	42.3	60.0	48.8	0.62	0.67	0.63	0.05 ns
10	Excessive use	26.9	60.0	39.0	0.50	1.13	0.73	2.96 *
11	Need alternate methods/practice	30.8	53.3	39.0	0.42	0.67	0.51	1.12 ns
12	Wasteful	26.9	53.3	36.6	0.31	0.93	0.54	5.49 **
13	Economics over envt./community	34.6	20.0	29.3	0.69	0.27	0.54	1.66 ns
14	Efficient/less use of resources	19.2	40.0	26.8	0.38	0.60	0.46	0.46 ns
15	Popln. growth/overpopulation	30.8	20.0	26.8	0.35	0.20	0.29	0.77 ns
16	Sustainability	3.8		2.4	0.04		0.02	nr
	Sample size (Ni)	26	15	41				

* - significant at $p < 0.10$; ** - significant at $p < 0.05$; ns – not significant; nr – analysis not run

Appendix 5.6 Percentage distribution, score mean, and ANOVA results for environmental concern score by gender

Particulars	Gender		Total	F
	Female	Male		
Groups score means	7.42	9.36	8.46	5.48 **
% of participants (Ni) expressing environmental concern at least once during MTAT session	100	100	100	
Sample size (Ni)	19	22	41	

** - significant at p <0.05

Appendix 5.7 Distribution of positive and negative environmental state association by gender

(in percentage by environmental forms)

Sl	Environmental forms/scenes	Female		Male	
		Negative	Positive	Negative	Positive
1	Factory	94.7		100.0	
2	Landfill	89.5		100.0	
3	Highway/traffic congestion	89.5		95.5	
4	City	68.4		90.9	
5	Logging (sawing a tree)	78.9	15.8	90.9	22.7
6	Strip mall	52.6		68.2	
7	Sub-division	42.1	10.5	59.1	4.5
8	Wildlife	47.4	10.5	54.5	31.8
9	Agriculture	47.4	5.3	45.5	
10	Chicken houses	15.8		36.4	4.5
11	River dam	31.6	5.3	36.4	13.6
12	Forest	21.1	36.8	31.8	63.6
13	Stream	21.1	10.5	31.8	27.3
14	Wetland	5.3	26.3	31.8	40.9
15	Manicured lawn	31.6	10.5	27.3	4.5
16	Cattle pasture	5.3		22.7	13.6
17	Arid area		10.5	13.6	22.7
Average		43.7	8.4	55.1	14.7
Sample size (Ni)		19		22	

Appendix 5.8 Percentage distribution, score means, ANOVA results of environmental concern-related themes by gender

Sl		Percent of Ni			Score mean			F
		Female	Male	Total	Female	Male	Total	
1	Environmental degradation - simple	100.0	100.0	100.0	4.79	5.86	5.37	2.58 ns
2	Environmental degradation - complex	10.5	36.4	24.4	0.11	0.91	0.54	4.62 **
3	Physical degradation of landscape	78.9	77.3	78.0	1.58	1.73	1.66	0.10 ns
4	Loss of wildlife and habitat	68.4	72.7	70.7	0.95	1.14	1.05	0.40 ns
5	Ecosystem threat & alteration	31.6	50.0	41.5	0.37	1.00	0.71	2.54 ns
6	Sprawl and growth	21.1	36.4	29.3	0.21	0.64	0.44	3.24 *
7	Loss of biodiversity	10.5	0.0	4.9	0.11	0.00	0.05	nr
8	Loss of medicinal and plant species	0.0	4.5	2.4	0.00	0.09	0.05	nr
9	Economics over envt./community	31.6	27.3	29.3	0.47	0.59	0.54	0.13 ns
10	Efficient/less use of resources	36.8	18.2	26.8	0.58	0.36	0.46	0.49 ns
11	Excessive use	31.6	45.5	39.0	0.95	0.55	0.73	1.23 ns
12	Need alternate methods/practice	42.1	36.4	39.0	0.58	0.45	0.51	0.31 ns
13	Population growth/overpopulation	36.8	18.2	26.8	0.37	0.23	0.29	0.77 ns
14	Sustainability	0.0	4.5	2.4	0.00	0.05	0.02	nr
15	Waste management and recycling	36.8	59.1	48.8	0.42	0.82	0.63	3.15 *
16	Wasteful	36.8	36.4	36.6	0.47	0.59	0.54	0.18 ns
Sample size (Ni)		19	22	41				

* - significant at p <0.10; ** - significant at p <0.05; ns – not significant; nr – analysis not run

Appendix 5.9 Percentage distribution, score mean, and ANOVA results for environmental concern score by age

Particulars	Age group				F	LSD t-test
	20-40	40-60	>60	Total		
Groups score means	8.31	8.88	8.08	8.46	0.29 ns	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
% of participants (Ni) expressing environmental concern at least once during MTAT session	100	100	100	100		
Sample size (Ni)	13	16	12	41		

ns – not significant

Appendix 5.10 Distribution of positive and negative environmental state association by age (in percentage by environmental forms)

Sl	Environmental forms/scenes	20-40 years		40-60 years		60 years	
		Negative	Positive	Negative	Positive	Negative	Positive
1	Factory	92.3		100.0		100.0	
2	Highway/traffic congestion	76.9		100.0		100.0	
3	Landfill	84.6		100.0		100.0	
4	Logging (sawing a tree)	92.3	15.4	93.8	18.8	66.7	25.0
5	City	76.9		81.3		83.3	
6	Wildlife	38.5	23.1	62.5	12.5	50.0	33.3
7	Agriculture	46.2		56.3	6.3	33.3	
8	Sub-division	53.8		56.3	12.5	41.7	8.3
9	Strip mall	69.2		50.0		66.7	
10	Chicken houses	15.4	7.7	37.5		25.0	
11	River dam	46.2		37.5	18.8	16.7	8.3
12	Manicured lawn	23.1	7.7	37.5		25.0	16.7
13	Stream	23.1	15.4	25.0	12.5	33.3	33.3
14	Forest	30.8	46.2	18.8	43.8	33.3	66.7
15	Cattle pasture	15.4	7.7	12.5		16.7	16.7
16	Wetland	30.8	38.5	12.5	31.3	16.7	33.3
17	Arid area	15.4	15.4	6.3	12.5		25.0
	Average	48.9	10.4	52.2	9.9	47.5	15.7
	Sample size (Ni)	13		16		12	

Appendix 5.11 Percentage distribution, score means, ANOVA results of environmental concern-related themes by age

Sl	Themes	Percent				Mean				F
		20-40	40-60	>60	Total	20-40	40-60	>60	Total	
1	Environmental degradation - simple	100.0	100.0	100.0	100.0	4.69	5.81	5.50	5.37	0.98 ns
2	Environmental degradation - complex	23.1	25.0	25.0	24.4	0.23	0.56	0.83	0.54	0.72 ns
3	Physical degradation of landscape	84.6	75.0	75.0	78.0	2.31	1.06	1.75	1.66	2.75 *
4	Loss of wildlife and habitat	84.6	68.8	58.3	70.7	1.77	0.81	0.58	1.05	7.58 **
5	Ecosystem threat & alteration	53.8	37.5	33.3	41.5	0.69	0.94	0.42	0.71	0.55 ns
6	Sprawl and growth	30.8	25.0	33.3	29.3	0.38	0.44	0.50	0.44	0.07 ns
7	Loss of biodiversity	7.7	0.0	8.3	4.9	0.08	0.00	0.08	0.05	nr
8	Loss of medicinal and plant species	7.7	0.0	0.0	2.4	0.15	0.00	0.00	0.05	nr
9	Excessive use	61.5	25.0	33.3	39.0	1.08	0.56	0.58	0.73	0.83 ns
10	Wasteful	38.5	43.8	25.0	36.6	0.69	0.63	0.25	0.54	0.94 ns
11	Need alternate methods/practice	30.8	37.5	50.0	39.0	0.31	0.56	0.67	0.51	0.85 ns
12	Population growth/overpopulation	38.5	25.0	16.7	26.8	0.38	0.25	0.25	0.29	0.30 ns
13	Economics over envt./community	30.8	37.5	16.7	29.3	0.38	0.69	0.50	0.54	0.31 ns
14	Sustainability	0.0	0.0	8.3	2.4	0.00	0.00	0.08	0.02	nr
15	Waste management and recycling	61.5	43.8	41.7	48.8	0.69	0.50	0.75	0.63	0.45 ns
16	Efficient/less use of resources	30.8	31.3	16.7	26.8	0.38	0.50	0.50	0.46	0.06 ns
Sample size (Ni)		13	16	12	41					

* - significant at $p < 0.10$; ** - significant at $p < 0.05$; ns – not significant; nr – analysis not run

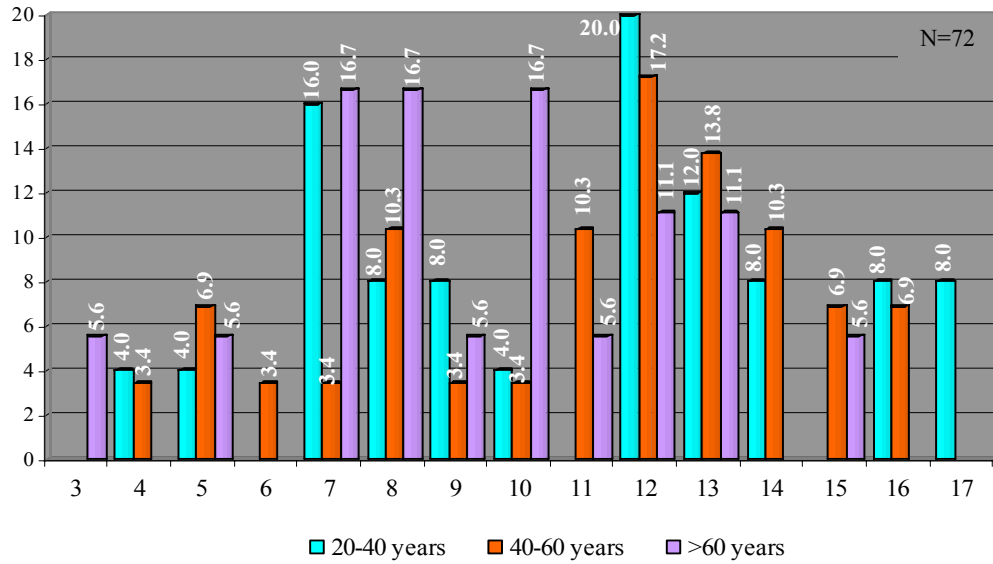
Appendix 5.12 Percentage distribution, score mean, and ANOVA results for environmental concern score by age

(N=72 inclusive of ACTV and NM/PF)

Particulars	Age group				F	LSD t-test
	20-40	40-60	>60	Total		
Groups score means	10.96	11.00	9.33	10.57	1.55 ns	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
% of participants (Ni) expressing environmental concern at least once during MTAT session	100	100	100	100		
Sample size (Ni)	25	29	18	72		

ns – not significant

Appendix 5.13 Percentage distribution of sample for environmental concern score by age for the full sample



Appendix 5.14 Percentage distribution, score mean, and ANOVA results for environmental concern score by education

Particulars	Education level				F	LSD t-test
	<UG	UG	>UG	Total		
Groups score means	8.32	8.00	9.50	8.46	0.72 ns	<UG v UG ns <UG v >UG ns UG v >UG ns
% of participants (Ni) expressing environmental concern at least once during MTAT session	100	100	100	100		
Sample size (Ni)	22	11	8	41		

ns – not significant, UG – undergraduate

Appendix 5.15 Distribution of positive and negative environmental state association by education

(in percentage by environmental forms)

Sl	Environmental forms/scenes	< UG		UG		> UG	
		Negative	Positive	Negative	Positive	Negative	Positive
1	Factory	100.0		90.9		100.0	
2	Logging (sawing a tree)	72.7	22.7	100.0	18.2	100.0	12.5
3	City	86.4		63.6		87.5	
4	Highway/traffic congestion	100.0		81.8		87.5	
5	Landfill	100.0		90.9		87.5	
6	Strip mall	54.5		63.6		75.0	
7	Wildlife	45.5	22.7	54.5	36.4	62.5	
8	Agriculture	45.5		45.5	9.1	50.0	
9	Cattle pasture	9.1	9.1			50.0	12.5
10	Sub-division	54.5	4.5	45.5	9.1	50.0	12.5
11	Stream	27.3	22.7	9.1	27.3	50.0	
12	Wetland	13.6	36.4	18.2	36.4	37.5	25.0
13	Chicken houses	31.8		18.2		25.0	12.5
14	River dam	36.4	18.2	36.4		25.0	
15	Forest	22.7	54.5	36.4	36.4	25.0	62.5
16	Manicured lawn	27.3	4.5	36.4	9.1	25.0	12.5
17	Arid area	4.5	22.7	9.1	9.1	12.5	12.5
Average		48.9	12.8	47.1	11.2	55.9	9.6
Sample size (Ni)		22		11		8	

Appendix 5.16 Percentage distribution, score means, ANOVA results of environmental concern-related themes by education

Sl	Themes	Percent of Ni				Score mean				F
		< UG	UG	>UG	Total	< UG	UG	>UG	Total	
1	Environmental degradation - simple	100.0	100.0	100.0	100.0	5.68	4.64	5.50	5.37	0.86 ns
2	Environmental degradation - complex	22.7	27.3	25.0	24.4	0.64	0.36	0.50	0.54	0.17 ns
3	Physical degradation of landscape	72.7	90.9	75.0	78.0	1.45	1.45	2.50	1.66	1.63 ns
4	Loss of wildlife and habitat	59.1	90.9	75.0	70.7	0.82	1.36	1.25	1.05	1.47 ns
5	Ecosystem threat & alteration	40.9	36.4	50.0	41.5	0.82	0.36	0.88	0.71	0.53 ns
6	Sprawl and growth	18.2	36.4	50.0	29.3	0.23	0.36	1.13	0.44	4.74 **
7	Loss of biodiversity	0.0	9.1	12.5	4.9	0.00	0.09	0.13	0.05	nr
8	Loss of medicinal and plant species	0.0	9.1	0.0	2.4	0.00	0.18	0.00	0.05	nr
9	Excessive use	18.2	63.6	62.5	39.0	0.27	1.55	0.88	0.73	5.47 ***
10	Wasteful	22.7	63.6	37.5	36.6	0.27	0.91	0.75	0.54	2.43 ns
11	Need alternate methods/practice	36.4	45.5	37.5	39.0	0.45	0.64	0.50	0.51	0.23 ns
12	Population growth/overpopulation	27.3	45.5	0.0	26.8	0.32	0.45	0.00	0.29	1.98 ns
13	Economics over envt./community	18.2	45.5	37.5	29.3	0.36	0.73	0.75	0.54	0.66 ns
14	Sustainability	0.0	0.0	12.5	2.4	0.00	0.00	0.13	0.02	nr
15	Waste management and recycling	36.4	54.5	75.0	48.8	0.45	0.73	1.00	0.63	1.82 ns
16	Efficient/less use of resources	18.2	27.3	50.0	26.8	0.18	0.55	1.13	0.46	3.07 *
Sample size (Ni)		22	11	8	41					

* - significant at $p < 0.10$; ** - significant at $p < 0.05$; *** - significant at $p < 0.01$; ns – not significant; nr – analysis not run

Appendix 6.1 Pro-environmental behavior score mean, and ANOVA results by level of activism

Variables	Categories	N	Mean	F	p	LSD t-test
Level of activism	ACTV	11	7.91	35.06	0.000	AC v NM *** AC v NP *** NP v LP ***
	NM/PF	17	5.41			
	LAYP	39	3.15			
	Total	67	4.51			
Age	20-40yrs	13	3.08	0.15	0.861	20-40 v 40-60 ns 20-40 v >60 ns 40-60 v >60 ns
	40-60yrs	15	3.33			
	>60yrs	11	3.00			
	Total	39	3.15			
Education	<UG	20	2.90	0.51	0.605	<UG v UG ns <UG v >UG ns UG v >UG ns
	UG	11	3.36			
	>UG	8	3.50			
	Total	39	3.15			
Ethnicity	Black	24	2.92	1.36	0.25	
	White	15	3.53			
	Total	39	3.15			
Gender	Female	19	3.05	0.14	0.708	
	Male	20	3.25			
	Total	39	3.15			

*** - $p < 0.01$; ns – not significant; AC – ACTV; NM - NM/PF; LP – LAYP; UG – Undergraduate

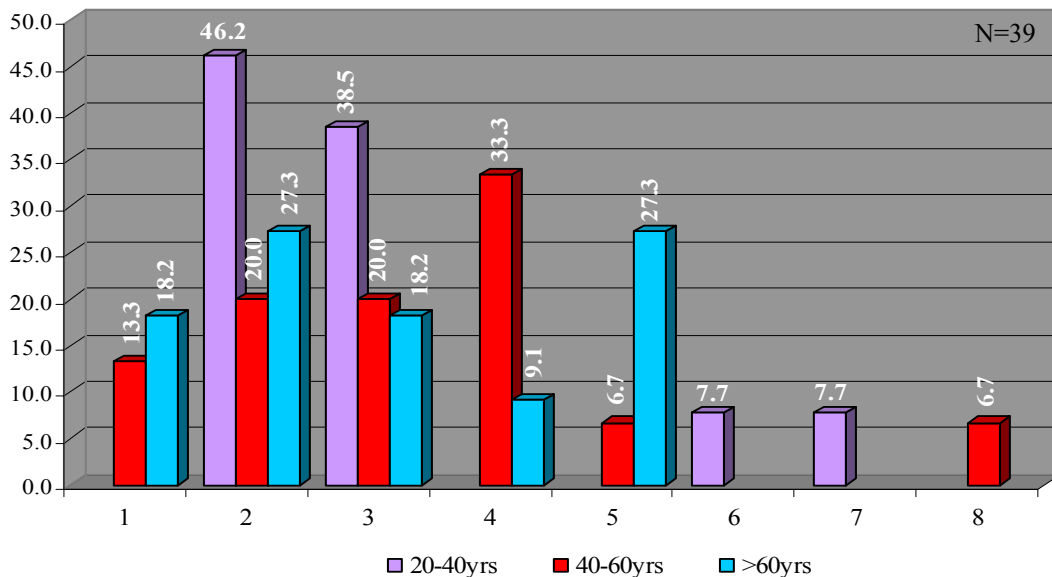
Appendix 6.2 Percentage of reported pro-environmental behavior by ethnicity

Sl	Category	Black	White	Total
1	Recycle	91.7	100.0	94.9
2	Do not litter/pickup trash/litter	37.5	53.3	43.6
3	Dispose garbage/toxics appropriately	20.8	26.7	23.1
4	Car - maintain regularly	25.0	13.3	20.5
5	Minimize waste, money/resource use	12.5	20.0	15.4
6	Save trees/Ground cover	12.5	20.0	15.4
7	Car - minimize use	8.3	20.0	12.8
8	Careful about the products I buy/use	4.2	20.0	10.3
9	Conserve water	8.3	13.3	10.3
10	Compost	8.3	6.7	7.7
11	Conserve energy/electricity	12.5		7.7
12	Do not open burn	8.3	6.7	7.7
13	Educate or talk to others	8.3	6.7	7.7
14	Lobbyist/member of envtl. org.	8.3	6.7	7.7
15	Do not smoke	4.2	13.3	7.7
16	Take my own bag to grocery	4.2	6.7	5.1
17	Bike/Walk to downtown		6.7	2.6
18	Buy local/organic		6.7	2.6
19	Car - fuel efficient/hybrid	4.2		2.6
20	Do not bother wild life	4.2		2.6
21	Feed bird		6.7	2.6
22	Help election/Vote green		6.7	2.6
23	Lawn - Do not use chemicals	4.2		2.6
24	Try to live environmentally/not disrupt		6.7	2.6
25	Keep house clean		6.7	2.6
Sample size (Ni)		24	15	39

Appendix 6.3 Percentage of reported pro-environmental behavior by gender

Sl	Category	Female	Male	Total
1	Recycle	89.5	100.0	94.9
2	Do not litter/pickup trash/litter	36.8	50.0	43.6
3	Dispose garbage/toxics appropriately	10.5	35.0	23.1
4	Car - maintain regularly	5.3	35.0	20.5
5	Minimize waste, money/resource use	21.1	10.0	15.4
6	Save trees/Ground cover	15.8	15.0	15.4
7	Car - minimize use	10.5	15.0	12.8
8	Careful about the products I buy/use	21.1		10.3
9	Conserve water	15.8	5.0	10.3
10	Compost	10.5	5.0	7.7
11	Conserve energy/electricity	10.5	5.0	7.7
12	Do not open burn	10.5	5.0	7.7
13	Educate or talk to others	5.3	10.0	7.7
14	Lobbyist/member of envtl. org.		15.0	7.7
15	Do not smoke	5.3	10.0	7.7
16	Take my own bag to grocery	10.5		5.1
17	Bike/Walk to downtown	5.3		2.6
18	Buy local/organic	5.3		2.6
19	Car - fuel efficient/hybrid		5.0	2.6
20	Do not bother wild life		5.0	2.6
21	Feed bird		5.0	2.6
22	Help election/Vote green	5.3		2.6
23	Lawn - Do not use chemicals		5.0	2.6
24	Try to live environmentally/not disrupt		5.0	2.6
25	Keep house clean		5.0	2.6
Sample size (Ni)		19	20	39

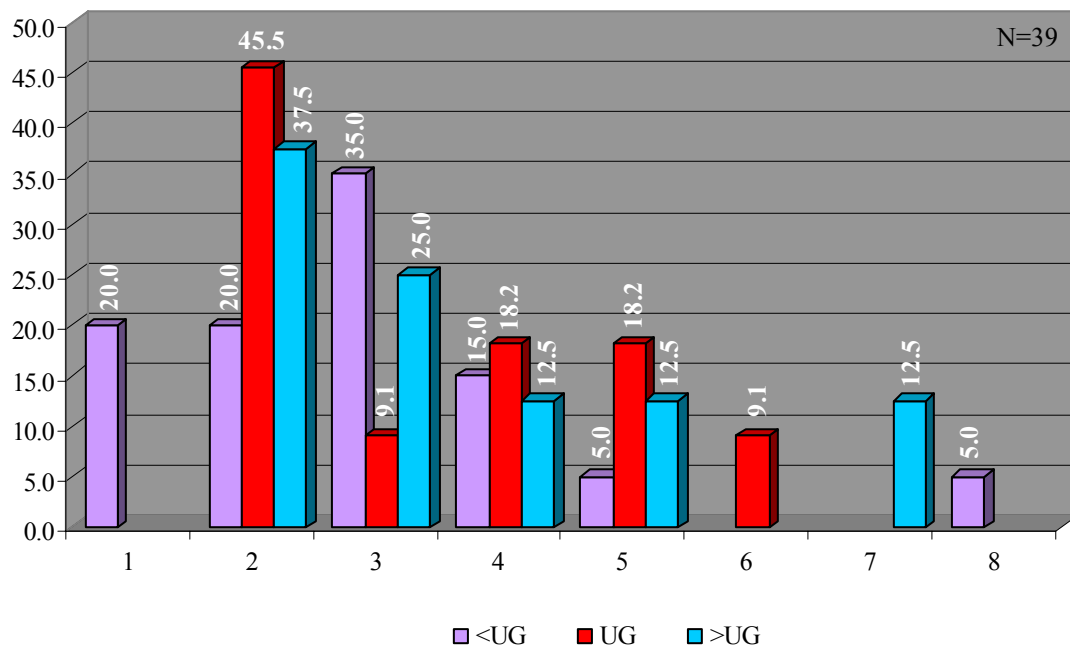
Appendix 6.4 Percentage distribution of reported pro-environmental behavior score count by age



Appendix 6.5 Percentage distribution of reported pro-environmental behavior by age

Sl	Categories	20-40yrs	40-60yrs	>60yrs	Total
1	Recycle	92.3	93.3	100.0	94.9
2	Do not litter/pickup trash/litter	38.5	53.3	36.4	43.6
3	Dispose garbage/toxics appropriately	15.4	20.0	36.4	23.1
4	Car - maintain regularly	23.1	13.3	27.3	20.5
5	Save trees/Ground cover		26.7	18.2	15.4
6	Conserve water	7.7	6.7	18.2	10.3
7	Do not open burn		6.7	18.2	7.7
8	Minimize waste, money/resource use	23.1	13.3	9.1	15.4
9	Lobbyist/member of envtl. org.		13.3	9.1	7.7
10	Do not smoke		13.3	9.1	7.7
11	Careful about the products I buy/use	15.4	6.7	9.1	10.3
12	Conserve energy/electricity	7.7	6.7	9.1	7.7
13	Do not bother wild life			9.1	2.6
14	Keep house clean			9.1	2.6
15	Car - minimize use	23.1	13.3		12.8
16	Compost	7.7	13.3		7.7
17	Educate or talk to others	7.7	13.3		7.7
18	Car - fuel efficient/hybrid		6.7		2.6
19	Feed bird		6.7		2.6
20	Help election/Vote green		6.7		2.6
21	Lawn – Do not use chemicals		6.7		2.6
22	Take my own bag to grocery	15.4			5.1
23	Bike/Walk to downtown	7.7			2.6
24	Buy local/organic	7.7			2.6
25	Try to live environmentally/not disrupt	7.7			2.6
Sample size (Ni)		13	15	11	39

Appendix 6.6 Percentage distribution participants by pro-environmental behavior score and education



Appendix 6.7 Percentage distribution of reported pro-environmental behavior by education

Sl	Categories	<UG	UG	>UG	Total
1	Recycle	95.0	100.0	87.5	94.9
2	Do not litter/pickup trash/litter	40.0	18.2	87.5	43.6
3	Dispose garbage/toxics appropriately	30.0	18.2	12.5	23.1
4	Car - maintain regularly	25.0	9.1	25.0	20.5
5	Minimize waste, money/resource use	10.0	18.2	25.0	15.4
6	Save trees/Ground cover	25.0	9.1		15.4
7	Car - minimize use	5.0	27.3	12.5	12.8
8	Conserve water	10.0	9.1	12.5	10.3
9	Careful about the products I buy/use	5.0	27.3		10.3
10	Lobbyist/member of envtl. org.	5.0		25.0	7.7
11	Conserve energy/electricity		18.2	12.5	7.7
12	Do not open burn	5.0	9.1	12.5	7.7
13	Educate or talk to others	10.0		12.5	7.7
14	Do not smoke	10.0		12.5	7.7
15	Compost	5.0	18.2		7.7
16	Take my own bag to grocery		9.1	12.5	5.1
17	Keep house clean			12.5	2.6
18	Bike/Walk to downtown		9.1		2.6
19	Buy local/organic		9.1		2.6
20	Car - fuel efficient/hybrid		9.1		2.6
21	Lawn - Do not use chemicals		9.1		2.6
22	Try to live environmentally/not disrupt		9.1		2.6
23	Do not bother wild life	5.0			2.6
24	Feed bird	5.0			2.6
25	Help election/Vote green	5.0			2.6
	Sample size (Ni)	20	11	8	39