Self, Society, and Environment in the 21st Century: The Development and Assessment of an Ecological Identity Scale

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DEDICATION

This dissertation is the product of many years of work and could not have been accomplished without the support of my family, close friends, and mentors. My wife Danyl and four boys Noah, Malikhai, Elias, and Oliver have supported me in countless ways, making the best of often very difficult situations. Over the years we as a family have been fortunate to be surrounded by wonderful friends and extended family members, and I dedicate this accomplishment to you all.

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ABSTRACT

Through a mixed-methods approach, this dissertation develops and assesses a multi-item scale measure of ecological identity (EI). Although recent decades have seen increased attention devoted to research on identity in relation to nature and the bio-physical environment, a valid and reliable scale capable of encompassing the complexities of this construct has yet to be developed. This dissertation uses an integral approach to build upon and extend recent attempts to develop measures of similar constructs. Key facets of multiple theories and perspectives on identity are integrated into a unified framework capable of multi-level identity analysis. A rigorous statistical approach that combines a pre-test power analysis with information-theoretic techniques of multi-model comparison and inference reveal a highly reliable and valid scale. The Ecological Identity Scale (EIS scale) is shown to better explain pro-ecological behavior than measures of many of the other more established constructs in this area (e.g. worldviews, attitudes, norms). Once developed, the new EIS scale is integrated with several other social and psychological measures into an exploratory path model of pro-ecological behavior. Three top performing models with varying levels of complexity are identified and EI appears in each of them, further supporting the validity of the construct.

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CHAPTER I
INTRODUCTION

Approaches to understanding and attempting to mitigate the causes and repercussions of contemporary environmental problems span multiple disciplines and involve many levels of analysis. For instance, natural scientists and engineers investigate causes and potential solutions through focusing on contemporary modes of production and technological innovation, while ecological economists build models to determine how contemporary market economies can be modernized so as to internalize the ecological costs that traditional economics routinely externalize. On other fronts, policy specialists focus on the implementation and evaluation of regulatory legislation, and action researchers collaborate with communities of resistance in efforts to achieve community environmental needs. Indeed, there is a vast range of scholarly work focused on modern society's often problematic relationship with the natural environment.

Within this wide-ranging body of research, sociologists have made and will continue to make, significant contributions to both our understanding of the forces that drive environmental degradation and potential solutions (Cable, 2012; Frey, 2012; Dunlap and Jones, 2002). By providing society a lens through which to view itself, sociology offers a unique set of tools for assessing and addressing environmental problems. However, despite the contributions of sociologists over the last 40 to 50 years, one might still ask, "can we see the forest for the trees?". That is, although substantial bodies of knowledge have been produced within environmental sociology, it is often the case that areas of research are rigidly divided between micro and macro-level, structural and cultural, and quantitative and qualitative approaches with little integration across these boundaries.

For sociology to continue contributing to our understanding and ability to mitigate environmental problems, studies from across these traditional boundaries must be able to build upon each other and produce cumulative results over time. Indeed, many sociologists recognize that one challenge for

environmental sociology today is to generate theories and employ methods that "cover the space between these extremes and that mediate between macro, meso, and microlevels" (Seippel, 2002, 199). Without efforts designed to cross these theoretical and methodological boundaries, the goal of accumulating useable knowledge is at risk. The dynamics of environmental degradation operate across varying levels of time and space, not in isolation from one another. Henceforth, our scientific inquiry into the causes and their potential solutions must be appropriately designed to cross traditional disciplinary boundaries and integrate multiple levels of analysis.

This dissertation attempts to conduct this type of integrative research. Its primary goal is to develop a valid and reliable multi-item scale measure of identity in relation to nature and the biophysical environment, (Ecological Identity), that improves upon existing related measures. *Ecological identity (EI)* can be thought of as who we think we are in relation to nature and the bio-physical environment. More formally it is conceptualized in this dissertation as ***the extent and ways by which an individual views him or herself as part of an integrated social and biophysical (i.e., ecological) system characterized by interconnected processes and relationships.*** A valid measure of such self-referent beliefs should be able to reliably assess the likelihood an individual will (or will not) take efforts to minimize the impact they and others have on the environment. Although such a pursuit is best classified as a micro-level social psychological analysis, this research integrates methodological and theoretical approaches that cross boundaries commonly found within environmental sociology, social psychology, and the social sciences more generally. This is accomplished in four key ways.

First, this dissertation integrates key aspects of different theoretical traditions within identity research into a unified framework of Ecological Identity (EI). Second, a measure of EI, the EIS scale, is developed by combining qualitative and quantitative approaches to social science research into a mixed-methods, known groups approach to scale construction. Third, after its

development it is integrated with other more established constructs into an exploratory model of pro-ecological behavior. Fourth, the testing throughout this dissertation integrates an information-theoretic approach with a pre-test statistical power analysis to produce robust results which are more easily compared to other studies. Each of these integrative facets is discussed in detail below, followed by a short overview of the research design and preview of the remaining chapters of the dissertation.

Integration of Identity Theories

The construct of Identity is used extensively in social science research spanning multiple levels of analysis and research paradigms (e.g. Beck and Beck-Gernsheim, 2002; Stets and Burke, 2000; Giddens, 1991; Bauman, 1990; Turner, 1985; Tajfel, 1981; Stryker, 1968, 1980; Goffman, 1963). Moreover, since the 1980s it has increasingly become a unifying theme within sociology (Jenkins, 1996). Within the environmental literature as well, there has been increased focus on the role that identity plays in our individual and collective responses to environmental problems. Evidence of this growing interest in how self and the environment are linked through identity can be found in the recent work on the subject over the last two decades (Dono et al., 2010; Dunlap and McCright, 2008; Clayton, 2003; Zavestoski, 2003; Stets and Biga, 2003; Kitchel et al. 2000, Weigert 1997, Thomashow,1995).

Because of its wide ranging use, and unifying capabilities, *identity* is ideal for conducting integrative research. For instance, a recent trend within social psychological identity research is toward integrating two particular theoretical traditions; Identity Theory (McCall and Simmons, 1978; Stryker, 1968 and 1980, Burke and Stets, 2009) and Social Identity Theory (Tajfel and Turner, 1979; Tajfel, 1981; Hogg and Abrams 1988). Intriguingly each of these theories is focused on a different level of identity analysis. Specifically, where Identity Theory focuses on an individual role-based level of analysis, Social Identity Theory focuses on a social category-based level. In this way, Identity Theory

directs our attention to the internalization of role expectations in the form of behavioral dispositions, while Social Identity Theory targets group membership and intergroup dynamics such as stereotyping and stigmatization. Both these perspectives offer insight into the drivers of pro and anti-ecological behavior, and creating links between the two offers the possibility of multi-level identity analysis (cf. Owens et al., 2010; Deaux and Martin, 2003; Stets and Burke, 2000).[1] This dissertation follows this recent trend and synthesizes key aspects of each into a unified framework of (EI). This trend has yet to find its way into environmental identity research.[2] Each of the existing measures of identity in relation to nature and the environment are grounded in separate theoretical traditions; one in Identity Theory (Stets and Biga, 2003), and the other in Social Identity Theory (Clayton, 2003). In this way, EI offers a more integral theory and measure that has the potential to advance not only environmental research, but the broader field of social psychology as well.

In addition to joining key aspects of Identity Theory and Social Identity Theory, the framework of EI developed in this dissertation also integrates elements of identity research focused on identification ***with like others***, and more critical approaches focused on ***dis-identification from unlike others***. Many Symbolic Interactionists, for instance, have long recognized that, "Identity is established as a consequence of two processes, apposition and opposition, a bringing together and setting apart" (Stone, 1962, 94). Indeed, identification *with like others* is only part of what constitutes a given identity. Identity also involves an active dis-*identification from unlike others*, and this has been shown to lend itself toward prejudice, discrimination, and control (Weigert, 2010; McCall, 2003; Jenkins, 1996; Tajfel, 1981; Adorno, 1998; Jenkins, 1996; Hogg et al., 1995).[3]

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[1] Many argue that multi-level identity analysis is needed because of a bias toward reductionism. Indeed, social psychological investigations of environmental issues in particular have been critiqued as ahistorical, overly reductionist, and decontextualized (Berezin, 2010; Harvey, 1996; Cronon, 1995)

[2] Each of the existing measures of identity in relation to nature and the environment are grounded in separate theoretical traditions; one in Identity Theory (Stets & Biga, 2003), and the other in Social Identity Theory (Clayton, 2003)

[3] 'Others' here is taken to represent unlike things, persons, or groups.

Consequently, it is important to examine how this may contribute to EI because it is through this dis-identification that power is most often exercised (Weigert, 2010). Each of the two existing efforts to develop scale measures of environmental identity are exclusively focused on assessing identification **with** the environment and fail to acknowledge the role of power, conflict, and difference (cf. Jenkins, 1996; Burkitt, 1991).

Integration of Research Methods

It is often the case that measures of social and psychological constructs are developed almost exclusively through a deductive armchair approach to scale construction. The typical procedure has been for researchers to develop indicators based mostly on their own knowledge and intuition. Once indicators are developed they are statistically tested via questionnaire, interviews, or some other format.

The existing scales of identity in relation to the environment are no exception to this typical approach. As best we can tell, the items that comprise these scales were based only on the knowledge of the researchers. The weakness of this method is its failure to systematically consult people who may have some experience or special knowledge related to the construct under investigation (i.e., ecological identity). Deriving measures of social psychological phenomena without a systematic consultation with people who may experience them raises clear questions of validity, content validity in particular.

Content validity describes the extent to which the items that make up a scale cover the full range of meanings associated with the underlying construct that the scale is intended to measure (Raykov and Marcoulides, 2011). Establishing content validity is contingent upon assumptions made regarding knowledge of the subject-matter domain. If the domain of subject matter associated with the underlying construct is well understood, then content validity can be established by illustrating that the scale items are representative of the domain. However, if the domain is less well circumscribed, then content validity

is usually assessed by analyzing the plans and procedures used to develop the scale items. If they were sound and well carried out, ensuring coverage of at least what is known about the domain, then the scale can be said to have content validity (Nunnally, 1978). Given the relatively recent focus on identity and the environment, it seems fair to assume that relatively little is known about this domain. Hence, to develop valid measures, attention needs to be paid to the process through which the items comprising such an scale are developed.

To ensure better coverage of the subject matter domain, and hence a more valid measure of identity, the Ecological Identity Scale (EIS) was developed by integrating both qualitative and quantitative methods into a known groups approach. In the initial stage of data gathering, focus groups were conducted with members of environmental organizations, because these individuals have been shown to hold known sets of attitudes, beliefs, and worldviews that are directly related to identification with nature and the biophysical environment (Kitchell et al., 2000). Information obtained from these meetings was used to develop the items that comprise the EIS scale. The scale was then statistically tested in a larger, more general sample. This approach produced a measure with a high level of content validity by grounding the items that comprise it in the concrete and lived realities of people who have likely internalized a strong ecological identity, as opposed to the intuitive beliefs of researchers.

Integration of Social Psychological Constructs

Social and psychological research on concern for the environment and its relation to behavior has a long and rich history. Much of this work began in the 1960s, when the seriousness and nature of environmental problems became more apparent to the public and the media through research conducted by scientists such as Rachel Carson. One of the proposed solutions to our ecological dilemma has been to study, understand, and ultimately change human behavior. Through the years, researchers have operationalized and tested a host of theoretical constructs such as worldviews, values, beliefs, attitudes,

norms, and identities in order to understand and predict pro and anti-ecological behavior.

Significant progress has been made over the last 50 years in the conceptualization, measurement, and modeling of how these variables influence behaviors and how they may lead to more environmentally-sound or responsible actions and policies. Though there has been a great deal of work identifying and understanding the drivers of these behaviors, far less attention has been devoted to developing models that integrate the range of constructs that have been developed. Identity in particular has only recently begun to appear in this literature. Research into identity has usually remained separate from values research, and attitudinal research has largely remained separate from these. Such factionalism is a difficulty in social psychology, leading to a lack of progress and coherence in the field as a whole (De Rosa, 2006). Indeed, some in the field argue that Social Psychology has a characteristic "zeal for the analytic approach (at the expense of the synthetic)," leading to research that is often blind to the similarities it may have with other research and theories (Aaronson, 1997,134).

This dissertation not only develops a theory and measure of ecological identity, it also integrates EI with other, more established constructs to test an exploratory model of pro-ecological behavior. Integrating identity with these other constructs is important because evaluations of self in relation to others, (i.e., identity), have been shown to be strong drivers of behavior and behavioral change (Stets and Carter, 2011; Dono et al., 2010; Burke, 2006; Stets and Harrod, 2004). Indeed, identity is thought to have the potential to predict "…a wide array of behaviors across situations," thus offering advantages over other social psychological constructs such as beliefs and attitudes, which are typically treated as highly specific to singular or small sets of behaviors (Stets and Biga, 2003, 399; Fishbeing and Ajzen, 2010). Several studies across a range of behavioral domains have documented the unique influence of identity on behavior (Rise et al., 2010).

This portion of the dissertation advances research on pro-ecological behavior by addressing an important question that has yet to be asked within the literature, "How do we determine or decide which behaviors are pro-environmental?" Although there has been a great deal of progress over the last 50 years identifying and understanding the drivers of pro-ecological behavior, there has been little attention devoted to conceptualizing and studying *behavior* itself. Similar to the idea discussed above, common sense assumptions or the intuition of those conducting the research are often the sole criteria determining which behaviors are selected for examination and which qualify as being, pro-ecological. Through this top-down approach, researchers are simply accepting what has normatively come to be defined as green behavior, and routinely failing to incorporate peoples' beliefs about what behaviors qualify as pro-environmental. It is likely that public perceptions of what types of behaviors are better or worse for the environment are varied, and people interested in minimizing their environmental impact may have their own knowledge about effective ways to do so.[4] Furthermore, failure to engage in a given pro-ecological behavior (PEB) may be a function of contextual influences as opposed to a lack of personal motivation.[5] Indeed, the barriers and bridges to performing PEBs are many and each of these complicating factors may render public perceptions of PEBs incongruous with the perceptions of researchers. This dissertation strives to improve upon past research by constructing an index of pro-ecological behavior derived in part from focus groups conducted with known environmentalists and people from the target population for the survey. These focus groups ensured better coverage of the behavioral domain, so that the final survey reflected the normative views and understandings of the target population.

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[4] This seems especially likely given the contested nature of environmental issues and the concept of *nature* in general (cf. Macnaghten and Urry, 1998),

[5] For example, research shows that access to institutional supports such as curbside recycling programs powerfully influence pro-environmental behavior (Derksen and Gartrell, 1993).

Integration of Statistical Methods to Promote Study Comparability

As mentioned above, for Sociology to continue contributing to our understanding and ability to mitigate environmental problems, studies must be able to build upon each other and produce cumulative results over time. Contrary to this goal however, statistical analyses within the social sciences are typically conducted in ways that inhibit comparability across studies. Specifically, social scientists routinely employ traditional null-hypothesis testing, which relies almost exclusively on significance tests to assess models and the inferential capabilities of parameter estimates (Burnham and Anderson, 1998). This use of null-hypothesis significance testing as the primary criteria for model development and inference is significantly problematic for two reasons. First, sample size can substantially affect significance tests. That is, the larger the sample size the more likely statistically significant results will be found when substantively there are none. Conversely, with smaller samples substantive findings that do exist, are more likely to be missed.[6,7] This issue has clear consequences for the validity and comparability of findings across studies. However, the problems can be effectively addressed by conducting a pre-test power analysis to determine the appropriate sample size for the topic under investigation.

The second reason that null-hypothesis significance testing is problematic for assessing models relates to its underlying assumptions that are grounded in probability theory. Specifically, if null-hypothesis significance tests support the relationships that researchers think exist, then the assumption (due to probability theory) is that the relationships can be assumed to exist in reality. This has resulted in an emphasis on valuing models that produce statistically significant results, and a de-emphasis on multi-model comparison. During the past twenty years however, "modern statistical activity has been moving away from traditional formal methodologies based on statistical hypothesis testing," and toward

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[6] In fact, within sociology there tends to be a bias toward larger sample sizes.
[7] Statistically these two scenarios are referred to as Type I errors (i.e. false positive), and Type II errors (false negative).

Information-Theoretic approaches (Burnham and Anderson, 1998, 20). The goal in using these information based approaches is to test multiple models to select which model best approximates the data in the most parsimonious way.[8]

This dissertation combines two analytic strategies in order to address the inadequacies of null-hypothesis testing. It integrates an information-theoretic approach with a pre-test statistical power analysis to produce statistically robust results that compare more easily to other studies. First, the pre-test power analysis allowed for precise statistical testing and accurate conclusions to be drawn about the relationships between EI and measures of other more established constructs. Second, through a process of multi-model comparison using information theoretic techniques, assessments were made about which combinations of social psychological constructs contributed most to an increased understanding of pro-ecological behavior.

Summary

Disciplinary and theoretical boundaries all too often isolate research findings and inhibit the cumulative production of useable bodies of knowledge. This seems especially true in social psychological research on the environmental where, given the scope of the subject matter, integration across these divisions is challenging. However, precisely because of the breadth of the subject matter, the discipline need research that spans multiple levels of analysis by incorporating multiple theoretical and methodological traditions. In response to this need, the four integrative strategies discussed above have been used to develop a multi-item scale measure of ecological identity that improves upon existing measures of related constructs. The development of the EI scale is important because identity has been shown to influence the processing of information and internalization of knowledge (Devine-Wright and Clayton, 2010). Thus it has the potential to increase our understanding of why some hold pro-

[8] Statistically, this is accomplished through the use of the AIC or another one of a few "distance" measures. This is discussed in more detail in Chapter 4, Stage 2.

environmental beliefs, attitudes, values, and worldviews, while others do not. Furthermore, by linking behavior directly to the self-concept via roles and group affiliations, EI has the potential to explain a wide array of behaviors and behavioral change across situations; including shifts in overall lifestyle toward more sustainable practices.

Methods

As discussed above, a mixed-methods known-groups approach to scale construction employing both focus groups and a survey was used to accomplish the goals of this dissertation. This approach involved three stages. In Stage (1), four focus groups were conducted to obtain information that was used to construct both the EIS scale and an index of pro-ecological behavior. Stage (2) involved the administration of a web-based survey to a sample of undergraduate students at the University of Tennessee (UT) for formal statistical testing and assessment of the EIS scale. Stage (3) involved testing an exploratory model of pro-ecological behavior that integrated Ecological Identity with other more established theoretical constructs. Each of these stages is discussed in more detail below.

Stage (1) was comprised of two phases. Phase (A) involved conducting three focus groups (six -10 participants) with members of environmental organizations, because they have been shown to hold known sets of attitudes, beliefs, and worldviews that are directly related to identification with nature and the biophysical environment (Kitchell et al., 2000). Both student and non-student organizations were represented in these meetings and systematic procedures were followed when choosing the organizations from which to select the participants. Focused discussion with members of these organizations provided valuable insight into the content and character of their views about themselves in relation to nature and the biophysical environment. This information served as the basis for the construction of the items that comprise both the EIS scale and the pro-ecological behavior index.

The second type of focus group (one session with six-10 participants) was conducted with a sample of UT undergraduate students drawn at random from the population of students between the ages of 18 and 29. This meeting (Phase B) served two primary purposes. First, it provided a baseline comparison/control group, against which to compare information gathered in the two different types of groups. Furthermore, given that the final survey instrument was tested using a random sample of UT undergraduate students, this session was used to ensure that the survey instrument reflects the normative views and understandings of the target population (cf. Fishbein and Azjen, 2010).

The survey Stage (2) occurred in two phases as well; a pre-test questionnaire and power analysis (Phase A), and a student survey (Phase B). In both, the information obtained from the focus groups formed the basis of questionnaires that were administered to a sample of UT undergraduates. Phase A involved the distribution of a small web-based pre-test questionnaire to a sample of around 220 undergraduates, 20 of which were known to be members of student environmental organizations. This questionnaire was used to obtain information about the target population (UT students) in relation to the key dependent variable to be used in Phase B validity testing (Ecological Behavior) from this a statistical power calculation could be conducted

Phase (B) involved a longer web-based survey distributed to a much larger sample of UT students (n = 4350). This survey contained the EIS scale, the pro-ecological behavior index, and measures of several other more established constructs frequently used in this area of research. A number of statistical tests were conducted to test the validity and reliability of the EIS scale, including Principal Component and Item-analysis, Alpha-Reliability testing, correlation analysis, and random-effects linear modeling. Finally, using the survey results, Stage (3) involved testing an exploratory model of ecological behavior that integrated EI with other more established theoretical constructs. This was done through a series of structural equation path models using information-theoretic criteria for multi-model comparisons.

Outline of Dissertation

The remainder of this dissertation is organized in the following way. Presented first is a review of the literature relevant to the development of a valid and reliable ecological identity scale. This review (Chapter 2) has two sections. The purpose of the first section is to map the conceptual boundaries between different social psychological constructs typically employed in this area of research, (i.e., beliefs, attitudes, values, norms, worldviews, and identities). It begins with a review of some literature on identity, both within and outside of studies related to the environment. Covered next are other key social psychological constructs that have seen use in environmental research. The second section of the literature review covers efforts that have been made to integrate many of these constructs into explanatory models of pro-ecological behavior.

Following the literature review Chapter 3 details the theoretical foundations of the proposed framework of ecological identity is detailed in Chapter 3. This section begins by discussing the integration of Identity and Social Identity theories. Next, it discusses the theoretical foundations of EI and introduces the notion of positionality.[9] Following this, the EI framework is presented and its assumed dimensionality is discussed. Chapter 3 concludes with a listing of the various expectations and hypotheses to be tested and how each relates to the validation of the EIS scale.

Chapter 4 presents the three stage research design that was followed to develop and test the EIS scale. The design and results of Stage (1), the focus group portion of the study, are discussed first. The design and results of Stage (2), the Survey portion of the study, are discussed next and Chapter 4 concludes with a discussion of the design and results of Stage (3), the exploratory model portion of the study. Finally, Chapter 5 draws conclusions about the overall

[9] Positionality is a phenomenon proposed in this dissertation to underlie most theoretical analyses of Identity, and constitutes a quintessential distinguishing feature of the construct.

validity and reliability of the proposed framework of EI and scale, and assesses the implications the results of this dissertation have for both academics and policy makers. The dissertation concludes with a discussion of the study's strengths, weaknesses, and suggestions for future research.

CHAPTER II
LITERATURE REVIEW

Social Psychology and Ecological Behavior: Particular Focus on Values, Worldviews, Identities, Beliefs, Attitudes, Norms, and Pro-ecological Behavior

Introduction and Overview

Like many other areas of research within Sociology, the literature covering the Social Psychological antecedents of behavior is both vast and complex, employing myriad constructs, and levels of analysis.[10] Not surprisingly, this literature is characterized by significant overlap and ambiguity ultimately resulting in conceptual confusion. Some have argued that Social Psychology has a "zeal for the analytic approach (at the expense of the synthetic)," leading to research that is often blind to the similarities it may have with other research and theories in the field (Aaronson, 1997,134). Variability and conceptual overlap is exacerbated by the divergent disciplinary background of researchers and the extent to which investigators ground their analysis in a given theoretical tradition or instead use common sense understandings of them. Indeed, recognition of this has compelled some to argue that researchers should make special efforts to formally integrate concepts from different areas of research and levels of analysis (Doise, 1986; Lorenzi-Cioldi and Doise, 1990; Hogg and Vaughn, 1995). In addition to argument in Chapter One regarding Environmental Sociology, we might ask of Social Psychology as well, "can we see the forest from the trees?"

As discussed in Chapter One, the primary goal of this dissertation is to develop and assess a valid and reliable measure of ecological identity, and then

[10] From this point forward, the term pro-ecological behavior will be used exclusively to refer to behavior that is thought to be good for or protective of the environment and species in it. This is done only in the interest of parsimony and aesthetic appeal, and it is understood that all arguments and analyses apply to pro-environmental behavior, green behavior, and anti-ecological behavior as well; or what McCright & Dunlap (2010), termed anti-reflexive environmental behavior.

to combine the scale with measures of other social psychological constructs into a hierarchical model of pro-ecological behavior (cf. Rokeach, 1973 and Gray, 1985).[11] The first step toward this integrative approach was to thoroughly review past research into the social psychological drivers of various forms of pro-ecological behavior. By doing so, three important goals were accomplished. First, the conceptual boundaries between different social psychological constructs typically employed in this area of research, (i.e. Beliefs, Attitudes, Values, Norms, Worldviews, and Identities), were identified. This ensured that the proposed framework of ecological identity is distinct from other constructs[12] Secondly, this review identified weaknesses within current conceptualizations of identity as it has been discussed in both the environmental literature, and the broader social psychology literature. Third, reviewing past research into the social and psychological drivers of pro-ecological behavior, identified specific ways that Ecological Identity should relate to other more established constructs. By accomplishing these goals, this review formed a solid foundation upon which the broader goal of the dissertation could be achieved.

The review contains two main sections. The first section examines the conceptual and theoretical bases of seven social psychological constructs (identities, worldviews, beliefs, values, attitudes, norms, and pro-ecological behavior). This section reviews key definitions and conceptual facets of the constructs. For each construct I will then offer a critique and assessment of its application toward understanding pro-environmental behavior as well discuss ways in which it relates to other social psychological constructs. The third section is comprised of a review and critical assessment of the two most prominent theories that attempt to integrate several constructs into a predictive model of pro-ecological behavior.

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[11] Rokeach (1973) proposed a hierarchical ten-level belief system which Gray (1985) later applied to pro-ecological behavior. The exploratory hierarchical model of pro-ecological behavior presented and tested in this dissertation is an adaptation on these earlier works.

[12] The ability for EI to be discriminated from other constructs is an important aspect of its validity.

Conceptual Boundaries:

Identity

Despite the variability noted above the establishment of a valid and reliable theory and scale measure of ecological identity as well as effectively combining it with measures of other constructs into a hierarchical model of pro-ecological behavior require and understanding of the quintessential distinct features of each. Appropriately, the first construct to be considered is Identity. By most accounts, the concept of identity is traced back to the foundational social psychological work on the self done by George H. Mead and William James (Bonnes et al., 2003). Although these theorists did not use the term identity, their research and theories into how individual's view themselves as objects within social contexts forms the basis for later symbolic interactionist research into Identity.[13]

In order to work toward a discussion of identity, it is necessary to begin with a brief discussion of the closely related concept of self. The social psychological concept of self has a long history within social psychology. Many would argue that the lineage for the contemporary understanding and conceptions of self and identity can be found in American pragmatism. An effective way of detailing the core concepts of self, and thus identity, is to briefly consider a few of the key contributions made by James and Mead.

The psychologist and philosophical pragmatist, William James was one of the earliest researchers to theorize individuals as having a complex arrangement of self-referent cognitions. He argued that the self exist in a hierarchy of *'me's',* "The constituents of the Me may be divided into three classes, those which make up respectively- The material me; The social me; and The spiritual me" (James, 1961, 44). Importantly, he also suggested that the self is comprised of all that "I can consider to be me and mine" (James, 1961, 38). It is in this conception of

[13] Symbolic interactionism is the most prominent research tradition within sociological social psychology and this dissertation will be grounded in this perspective.

the self including that which 'belongs' to the individual that we can find room for material objects, such as nature and the biophysical environment, as a fundamental part of the construction of self. Furthermore, the notion that cognitions are arranged in a hierarchy frequently undergirds contemporary social psychological research and theory, including this dissertation.

Like Mead who shortly followed him, James argued the self is comprised of two primary components, the '*I' and the 'Me'.* Mead more thoroughly developed these concepts, and suggested that the 'I' component of the self, can be thought of as pure ego or that which acts. He frequently referred to the, 'I', as t*he individual of the immediate moment* (Mead, 1934). "The I is the acting self: the 'ego' that moves into the future" (Jenkins, 1996, 41). The 'Me' on the other hand is understood to be the self as an object unto itself, possible only through the capability of symbolic representation, expression, and interaction with others. By taking the role of others, the self (through the faculty of the me) becomes conscious of its (the I) own existence. And so the me is, "the foil which gives form and substance to the 'I'"; hence the expression, the I acts toward the me (Jenkins, 1996, 41). "The 'I' reacts to the self which arises through the taking of the attitudes of others. Through taking those attitudes we have introduced the 'me' and we react to it as an 'I'…. The 'I' is the response of the organism to others: the 'me' is the organized set of attitudes of others which one himself assumes" (Mead, 1934, 174 and 175). From this brief discussion of the foundations of our modern conception of self-concept, we can see that the self is constructed through a process of interaction with others (both human and non-human), reflexive self appraisal, and the attachment of symbolic meaning to the self as an object in relation to others.

Now that we have established a foundational understanding of self we turn to the concept of identity. *Identity* can be thought of as a particular element or component of the broader self concept. Contemporary researchers argue that, "The concept of identity is nested within the more inclusive concept of the self," and that the self is comprised of a compilation of multiple identities arranged in a

hierarchy of psychological centrality (Owens et al., 2010, 478). Moreover, an identity is a particular component of the self that positions an individual in relation to some 'other' in a given social or environmental context. As one prominent symbolic interactionist states, "identities are internalized positional designations" (Stryker, 1980, 60).[14] Any single identity then resides within the 'me' and provides the self with an organized sense of meaning and continuity in relation to others in the environment. Identities arrange the multiple relationships we have with others and is, "A way of organizing information about the self" (Clayton, 2003, 45).

The construct of Identity has seen extensive use in the social sciences (e.g. Giddens, 1991, Beck and Beck-Gernsheim, 2002; Bauman, 1990; Tajfel, 1981; Stryker, 1968, 1980; Goffman, 1963); and although this work is broad in scope much of the contemporary research can be thought of as falling into one of three categories.[15] The first category involves efforts by researchers to construct quantitatively verifiable models of identity. This line of research is largely focused on studying the positioning of the self within groups of similarity and the taking on of roles. The second relevant category includes studies that focus attention on the impact identities have on interaction with others and the process of negotiating and establishing identity. The final category of contemporary research that will be addressed emphasizes the attribution of meaning, and the process of dis-identification and differentiation of the self from others.

Some contemporary research on identity is focused on largely quantitative efforts to understand elements of the self that involve the attribution of meaning to the self and others and the taking on of roles. Researchers in this tradition have drawn heavily from *role-identity theory* (McCall and Simmons, 1978) and

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[14] This positioning can involve purely cognitive as well as behavioral and interactive elements, and perhaps most realistically involves a dynamic relationship between each. Also, contemporary theorists argue that what can constitute a proper other has greatly expanded (See Cerulo, Karen A. (2009) "Nonhumans in Social Interaction" *Annual Review of Sociology* 35:531-552.

[15] An exhaustive discussion of the myriad ways and intricate complexities with which self and identity have been employed within contemporary social psychology is beyond the scope of this review.

identity theory (Stryker, 1968, 1980). Burke and Stets (2009) argue that these role-based identity theories emphasize situational elements, the interactive processes, and taking.[16] For instance, the framework advanced by Stryker (1968, 1980) emphasizes the structural elements and normative determinants of identities as roles. At their core, each of these theories see identities as, *internalized behavioral and dispositional expectations that result from one's particular status within sets of relationships and social structure* (i.e. Roles). Consider this telling quote from Stryker, "In the beginning there was society" (Stryker in Burke and Stets, 2009, 34).

From each of the earlier perspectives there have emerged three additional theories of role-based identity; *identity control theory* (Burke, 2004; Burke and Stets, 1999), *identity accumulation theory* (Thoits, 1983, 1986), and *affect control theory* (Heise, 1979). Both identity control theory and affect control theory conceive of the self as a system which works via identities, to achieve a degree of overall balance and equilibrium. In identity control theory for instance, an identity is thought of as "a set of self-relevant meanings held as standards for the identity in question," and the self is viewed as being comprised of multiple identities arranged in a hierarchy of psychological centrality (Burke, 2006, 81). Through the course of interaction the individual receives feedback from others, and this feedback is then compared to the identity standard. The individual, as a "dynamic, self-regulating control system", works to achieve equilibrium between the held identity standards, and the perceived feedback from others that relate to the given identity (i.e. the state of self-verification) (Burke, 2006, 82). Any discrepancy between the two will manifest cognitive inconsistency, and affective distress so as to motivate the individual to action. ICT has recently been successfully employed to explain identity change (Burke, 2006), moral behavior (Stets and Carter, 2011), various levels of self-esteem (Stets and Harrod, 2004), and pro-ecological behavior (Stets and Biga, 2003). Affect control theory

[16] For example, the situational self, reward structures, and alter-casting (see McCall and Simmons, 1978)

similarly views individual's in interactive situations as taking effort to achieve a degree of meaningful balance between things imbued with cultural meaning and value (e.g., self, other, activity) .[17]

Lastly, Identity Accumulation Theory (IAC) emphasizes the role that multiple role identities serve in the promotion of well-being. It, "asserts that multiple role-identities and group memberships can be psychological resources that help reduce emotional distress (depression) and foster global self-esteem in complex selves" (Owens et al., 2010, 482-483). In particular, empirical work has documented how IAC can explain variance in stress-related illness and overall levels of health (Linville, 1987; Wethington et al., 2000).

The second category of theories focuses on the role that action and behavior play in the development and maintenance of identities; that is, how behavior comes to construct identities. For instance, Gecas and Schwalbe (1983) draw upon Cooley's framework of the looking glass self and argue that sociologists often mistakenly place too much emphasis on how self-evaluations are affected by how other perceive us to the neglect of the role played by behavior in constructing the self. "In short, human beings derive a sense of self not only from the reflected appraisals of others, but also from the consequences and products of behavior that are attributed to the self as an agent in the environment" (Gecas and Schwalbe, 1983, 79). Interesting work by Charng et al., (1988) supports this position. In this study the researchers found that repeated engagement in the activity of blood donation influenced one's perception of themselves as blood donors. They argue that taking on the role of blood donor conveys meaning, "over and above the positive or negative attitudes…toward performing the behavior itself" (Charng et al., 1988, 304).

Related research in the social psychology of consumption has focused on how consumption is formative for identities and the broader self-concept. Researchers in this area have argued that, "Objects in our possession literally

[17] For a detailed discussion of the similarities and differences in the two theories, see Smith-Lovin & Robinson (2006)

can *extend the self*" (Belk, 1988, 145). One way that this occurs is through establishing control over material possessions, which is seen as culminating in the internalization of the possession and the *enlargement of self*. Indeed, it is not merely the case that possession of some material object becomes associated with the individual and grants him or her some sort of symbolic power in relation to others (e.g. money, status, etc), but instead the self is actuality changed through such a process. Belk (1988) argues that the self is extended through four modes of existence; having, being, doing, and knowing (Belk, 1988). Moreover, it is though these modes of existence that a given identity is experienced and expressed. These modes of existence provide a sort of scaffolding through which identities are constructed and maintained.[18]

The final category of contemporary identity research to be covered is focused on the role played by *differentiation and separation from others* in the development and maintenance of identities. For instance McCall (2003) argues that identification of the self with a certain group or social object is only part of the story. The flip side of the coin is that, "identifying with one social object entails dis-identifying with other social objects that differ from that one" (McCall, 2003, 12). This logical truism has been acknowledged by more critically oriented identity researchers for some time. Consider Stone's (1962) statement that, "Identity is established as a consequence of two processes, apposition and opposition, a bringing together and setting apart" (pg. 94). Some have even argued that this basic bifurcation between unity and opposition in social life and the formation of identities can be traced back to Simmel (Jenkins, 1996).

To empirically test for the presence of differentiation, or 'the not me', McCall (2003) altered a popularly used measure of identity, the twenty statements test (TST). The TST asks respondents to give 20 statements that answer the question, *who am I?* This was adapted to the, *who I am not,* or WAIN

[18] The framework suggested by Belk has been highly influential in research on identity within *Consumer Culture Theory (see Arnould & Thompson, 2005 & Dittmar, 2008)*

test. McCall examined the linguistic and semantic structure of the responses to both sets of tests. His findings suggest that, "the *me* is framed more in terms of roles and statuses whereas the *not-me* is framed more in terms of characteristics and dispositions" (McCall, 2003, 16). Interestingly, this finding connects to some of the research on out-group stereotyping found in *social identity* theory (Tajfel, 1974, 1978 and 1981; Tajfel and Turner, 1979).

Social Identity Theory (SIT), has shown that external attributions made by individuals to out-group members are often dispositional and undersirable (Tajfel, 1981). Like the work of McCall, SIT emphasizes external attribution and the unity with some that comes from differentiation of the self from others. In this way, "Social identity theory is intended to be a social psychological theory of intergroup relations", and it is grounded in "social factors of perception…and on cognitive and social belief aspects of racism, prejudice and discrimination" (Hogg et al., 1995, 259). In this way, social identity theory like the role-based identity theories discussed above (Stryker, 1968 and 1980; Burke and Stets, 2009), is in part an effort to ground an individual's social psychological make up in relation to social and cultural phenomena. However, one significant distinction between these two theoretical traditions is illustrated by the concept of self-categorization (Turner, 1985; Turner, 1991). Social identity theory argues that the process of self categorizing is the foundation of group behavior. Specifically, once categorized into a certain group, the perceived similarities between stimuli associated with in-groups, and the perceived differences between stimuli associated with out groups, are accentuated. This self-categorization and accentuation process allows the individual to construct prototypical representations of both in-groups and out-groups. These representations, "…define each group and describe appropriate behavior for members of each

group", and through reference to these prototypes the individuals behavior is normatively controlled (Hogg and Vaughn, 1995, 334).[19]

As has been discussed above, contemporary theorizing and research on the self and identity is rooted in the work of the early American pragmatists, and can be meaningfully subdivided into three categories depending on the particular aspects of identification that are emphasized. Given their similar foundations though they also share many commonalities, and the effort to draw distinctions between them must not overshadow their common theoretical lineage and basic assumptions. Interestingly, researchers have recently emphasized the need to develop formal theoretical and empirically testable linkages between the different perspectives (Owens et al., 2010; Stryker, 2008). There have been some efforts in this regard, particularly between the Social Identity Theory (Tajfel, 1981) and role-base identity theories (e.g. Stryker, 1968 and1980; Stets and Burke, 2009). Stets and Burke (2000) conclude that, "in most instances the differences are a matter of emphasis rather than kind", and that "a merger of identity theory with social identity theory will yield a stronger social psychology that can attend to macro, meso, and micro-level social processes" (Stets and Burke, 2000, 234). As will be seen in Chapter 3, one of the key contributions made by this dissertation is to establish formal theoretical links between these two theoretical perspectives and the more critical perspectives discussed in this review. Furthermore, in reference to the second category of identity theories covered in this review, Chapter 4 will include statistical analyses that directly compare a model of pro-ecological behavior that assumes identity develops from behavior and action with a model that assumes behavior and action result from identity. The next section provides a review of ways that the constructs of self and identity have been employed in the environmental literature.

[19] Research on white racial identity for instance draws heavily upon the themes in SIT and the work of McCall (see Perry, 2007; Frankenberg, 1995; Roedliger, 1994; Roman, 1993).

Self and Identity in the Environmental Behavior Literature

Self and Identity have been increasingly used within the environmental behavior literature. This research varies quite a bit in the degree to which it engages with the theoretical foundations of self and identity. Recall the distinction made earlier between theoretically and policy oriented research (cf. Dunlap and Jones, 2002). Indeed, within this literature as well, there is significant variation in the extent to which investigators ground their analysis in a given theoretical tradition versus investigating policy relevant questions. The review below will proceed by first discussing research that is more theoretically oriented reflecting some of the key facets of Identity discussed above. Second, environmental research using identity that is less concerned with conceptual integrity will be addressed. Finally, an assessment of areas for improvement is presented.

One effort to apply the social psychological constructs of self and identity to questions related to the environment and environmental behavior is found in Weigert (1997). Like Mead, Weigert argues that the self and self-recognition is impossible without meaningful interaction with others. Much of his work is thus centered on building the case for the natural environment as a social other with which humans meaningfully interact.[20] These meaningful human-environment interactions are embodied in the concept of transverse interaction (Weigert, 1997 and 1991). Furthermore, in the same way that Mead grounds the emerging self in an individual's internalization of the generalized other, Weigert advances the notion of a Generalized Environmental Other (GEO). The generalized other can be defined as the beliefs and attitudes of the larger community of which someone is a part (Mead, 1934). The classic argument posits that internalization of the generalized other compels the individual to recognize his or her place within the community, and take on appropriate roles and behavioral dispositions. Thus, internalization of a Generalized Environmental Other involves taking on roles and

[20] Meaningful in this sense connotes that the interaction is indeed a reciprocal process whereby aspects of the self are developed through the interaction.

behavioral dispositions that recognized the interrelationship between the self and the natural environment. Although little empirical work draws directly on the notion of the GEO, it is implicit in the work of Stets and Biga, 2003 (discussed below).

And so, Weigert ground his theory of emerging eco-selfs in meaningful human-environment interaction, referred to as *transverse interaction*. Furthermore, in the same way that Mead grounds an individual's internalization of the generalized other in his/her meaningful interaction with others, Weigert sees the potential for the emergence of a *generalized environmental other (GEO)* through this transverse interaction. Little empirical work however seems to draw directly on Weigert's work.

A second and closely related project that likewise works from a predominantly Meadian framework of emergence and the self, yet more empirical than the work of Weigert, is Capek's (2006) qualitative study of an acute event involving human-nature interaction. Capek describes how, following the disruption of a cattle egret habitat, thousands of the birds flooded into the town of Conway, Arkansas. During the months that ensued, she conducted content analysis of newspaper clippings covering the event, as well as a series of personal interviews. Through this data, Capek investigated what she later termed, *surface tension, a* concept which draws heavily on Blumer's (1969) discussion of the space between self and objects, as existing at a necessary distance. Specifically, this concept refers to, "the fluid, negotiated, and often contradictory quality of narratives about nature and self"…and…"the delicate balancing game whereby human beings-like the leaf floating in water-maintain separateness from and connectedness to surrounding structures and life forms" (Capek, 2006, 158). This space that circumscribes and defines our relationship with the natural world she argues is highly contested. Indeed, she documents the various attempts to attribute causal blame for the events, as well as the active projection of qualities onto the birds and individuals as they take up different positions in regard to the issue. However, it is in this regard that a major

weakness of the study is exposed. While giving lip service to the contested nature of "membrane" of space within which humans circumscribe and define both themselves and nature, she doesn't appear to acknowledge the inter group identity dynamics at play within such a context. Specifically, she documents very well the *boundary work* in the service of differentiating humans from nature. However, nowhere does she appear to acknowledge that such boundary work always already involves intergroup boundary work as well (i.e. human vs. human boundary work). Clearly this critique is grounded in the elements of social identity theory discussed above. Indeed, some of the particular respondent comments presented in the study clearly illustrated inter group dynamics.

Changing gears now, in 2003 Stets and Biga published what is arguably the first empirical work using identity theory to predict behavior, while also engaging directly with the sub discipline of environmental sociology. In their research they employed a framework of identity rooted in symbolic interactionist sociology. In particular, the researchers employed identity control theory. Importantly, the identity model of behavior tested suggests a conceptually distinct and unique impact on behavioral intention beyond the effects of attitude and belief. As Stets and Biga suggest, "the level of analysis…is different….Attitude theory, rooted in psychology, focuses on how individuals make choices or decisions regarding a specific object or situation. Identity theory, rooted in sociology, focuses not simply on individuals' choices but on how persons who are multi-facetied and are embedded in the social structure guide those choices" (Stets and Biga, 2003, 399).[21] The model of identity employed in this study can be placed in the larger body of Identity theory as being reflective of what has come to be called Identity Control Theory (Burke and Reitzes, 1981; Burke 2004; Burke and Stets 2009). As discussed earlier, the ICT model suggests that an identity is a set of meanings attached to the self. Burke and his collaborators emphasize what they term the control elements of identity. Essentially the

[21] This is a strong critique, and I would argue that Sociology's claim to Identity theory is tenuous, none-the-less, there are clear differences between a sociological conception of identity, and a psychological one.

various meanings attached to self (Identity) come to serve as ideal notions regarding the self, this is termed the *identity standard*. Through interaction and feedback from others, the self compares this standard with the feedback received from others. If the two are in correspondence, verification of self is said to have been achieved. Henceforth, Burke and others argue that individuals attempt to control the perceptual input (feedback received from others) in order that this input matches the internal identity standard. "When a lack of self-verification exists, behavior is altered to counteract the situational disturbances and restore perceptions to match the identity standard" (Stets and Biga, 2003, 402-402). Furthermore, Burke's model of identity posits that identity salience, prominence, and commitment are important elements linking identity and behavior. Prominence refers to the hierarchical arrangement of multiple identities contained within any given self. Salience refers to the probability of enacting, or a "readiness to play out" and identity (Stets and Biga, 2003, 404). Commitment refers to both the number of people to whom one is connected by a given identity as well as stronger these particular connections with others may be. The authors find significant and unique affects of identity in relation to various pro-environmental behaviors (Willingness to pay higher prices, making changes to every day behavior, boycotting of certain products, etc). Furthermore, the findings suggest that with the inclusion of the identity measures, the predictive power of measures such as ecological worldview (NEP) and awareness of consequences (i.e. Schwartzian theory), are significantly diminished.

It is in this regard to measurement that there is a fifth and significant effort to note. Clayton (2003) combines elements of social identity theory such as identity salience, agreement with an in group ideology, and the emotions associated with collective membership to develop a 24 item scale designed to tap *environmental identity*. Tests for convergent, discriminant and predictive validity were conducted using an undergraduate student sample. The scale items were tested in relation to Thompson and Barton's (1994) Environmental Attitude Scale, twenty four values items related to eight of the value dimensions

identified by Schwartz (1992), and a world view typology suggested by Triandis (1995) which assesses the extent to which respondents reflect an individualist or collectivist orientation and an horizontal or vertical orientation.

Clayton reports that in all assessments the environmental identity items correlated in the expected direction. In terms of the scale items relation to individual pro-environmental behavior, the author assessed zero order as well as partial correlations with the previously listed measures acting as controls. Again, the EID correlations remain in the expected direction and statistically significant operations. Lastly, she presented students with a hypothetical scenario, regarding an issue of environmental conflict, and an issue of justice in relation to the environment. In both cases those students who registered higher on the EID scale were much more likely to take the pro-environmental position in each scenario.

Such a measure as has been designed here is very much needed in the field. As will be discussed below, many argue that a major impediment to the creation of a more sophisticated integrative model that incorporates identity into the *Theory of Planned Behavior* (Ajzen, 1985), is the lack of a valid measure for identity (Fishbein and Ajzen, 2010). However, the statistical analyses used in Clayton's study, although sound, are rather simplistic, as they give us no information regarding the dimensionality of the underlying or latent construct. Still, as the only known effort to design a quantitative scale measure of identity that incorporates elements of both identity and social identity theory future research should target these items and attempt to refine our understanding of them.

A recent article by McCright and Dunlap (2010) is the subject of the last substantive application of identity theory to questions of environmentally significant behavior. Perhaps more than any other study on identity and the environment, this work, although brief, embodies a critical intergroup analysis of the social psychological antecedents of in this case, anti-environmental (or anti-reflexive) behavior. The researchers draw upon Kahan et al., (2007), to discuss

the hypothesis of identity –protective cognition. This hypothesis is related to the long acknowledged "white male-effect" documented in risk studies (Finucane et al., 2000; Flynn et al., 1994). The basic idea is that the white male effect, (white males are found statistically to be much more accepting of a wide range of risks), can be explained by a type of "*motivated cognition* through which people seek to deflect threats to identities they hold, and roles they occupy, by virtue of contested cultural norms" (Kahan et al., in McCright and Dunlap, 2010, 4). Hence, the higher rates of climate change denial amongst white men is a function of their attempts to construct a protective cognitive 'shell' around the status hierarchy within which they occupy a position of privilege. As can be seen, this notion of motivated cognition is significantly related to the discussion above of identity studies that emphasize external attribution and the differentiation of the self from others (McCall, 2003, Perry, 2007; Frankenberg, 1995; Roedliger, 1994; Roman, 1993). Interestingly as well, studies grounded in social identity theory that investigate causal attribution have documented the tendency for in groups to target out groups as being causally responsible for negative events and conditions. Furthermore, more micro-oriented studies of causal attribution show that in conditions of ambiguity and uncertainty, fundamental errors in attribution are much more likely to occur (Hogg and Vaughn, 1995). There seems to be significant potential to apply the concept of identity to environmental risk issues, and especially the issue of climate change.[22]

Critique and Assessment

Although a plurality of approaches may be most appropriate, it remains vital that researchers avoid an increasing fragmentation of the empirical

[22] Several researchers in the area of identity who's contributions likely could be used to contribute to a more effective understanding of society-nature relations and in particular environmentally significant behavior have not been mentioned:Place identity theory (Proshansky, 1978; Proshansky, Fabian & Kaminoff, 1983) are a few.

literature, which can arise where empirical studies are conducted without a strong conceptual basis, or where particular epistemological positions become entrenched, leading to alternatives being merely caricatured or ignored. Such factionalism has already been a difficulty in social psychology, leading to a lack of progress and coherence in the field as a whole (De Rosa, 2006).

And so what can be made of identity in relation to nature and the biophysical environment? Indeed, definitions vary in their content, the degree they are made explicit, and the extent to which they are grounded in any identifiable theory[i]. Thomashow (1995) describes *ecological identity* as, "all the different ways people construe themselves in relationship to the earth as manifested in personality, values, action, and sense of self" (pg. 3). Clayton (2003) conceptualizes *environmental identity* as, "a sense of connection to some part of the nonhuman natural environment, based on history, emotional attachment, and/or similarity that affects the ways in which we perceive and act toward the world; a belief that the environment is important to us and an important part of who we are" (Clayton in Clayton and Opotow, 2003, 46). Lastly, Stets and Biga (2003) conceive of *environment identity* as, "the meanings that one attributes to the self as they relate to the environment. We conceptualize these self-meanings as ranging from non-exploitative and supportive to exploitative and non-supportive of the environment" (pg. 406). Although each of these conceptualizations differ in important ways, one quintessential feature they all share is that they each express something about the *positioning of self in relation to some other*. And indeed, a review of the broader social psychological literature shows that this *positioning* is a core element of identity theories. This notion of positioning is fundamental to the framework of Ecological Identity developed in the next Chapter.

Human, Social, and Environmental Values and Valuation

As can be seen from the discussion above, one of the benefits of considering self and identity as a social psychological antecedent of

environmentally significant behavior is that inherent within these constructs is the notion of internalization. That is, when an individual takes on an environmental identity say in the way suggested by Weigert or Stets, the individual is in effect including the self in nature or nature in the self. This is an important feature of identity and self as analytical constructs for it is often argued that the fundamental problematic regarding human-environment relations is the alienated, structural separation that exists between the two. Self and identity provide a foil through which theorizing and empirical research can navigate this reified experience hence breaking down this false dualism. The next social psychological construct to be reviewed has similar characteristics. Indeed, as will be seen, the research into environmental values likewise provides an analytical bridge, making possible an ability to uncover some of the dynamics that create and maintain the reification of nature. The following pages will proceed as follows. First I will provide a brief discussion of the social psychological foundations of values. This will involve drawing an important distinction between the concept of a held value and valuation. Secondly, I will provide a consideration of the basic formulations and conceptualizations of values within the broader social psychological literature. Next, I will explore the literature on environmental values as well as review some of the current theoretical and empirical literature on the subject. Finally, a critique and appraisal of this literature will conclude the section.

Before beginning our discussion of the social psychological dimensions and constituent elements of values, it is important to draw attention to two pertinent ways of classifying research invoking the term value. Kalof and Satterfield (2005) draw an important and useful distinction between axiomatic versus relativistic value studies. The principal components that separate the two relate to differences in their underlying assumptions and hence, the research questions and goals pursued. Essentially axiomatic research assumes, and hence seeks to uncover the actual value of a given object, situation, or state of being. Clearly such an approach is rooted in the assumptions of positivistic

science. “Assumed to exist are higher and lower order expert-defined values, which are amenable to measurement and provide self evident truths as to the real value of a good” (Kalof and Satterfield, 2005, xxiii). By contrast then, research that takes on a relativistic orientation places the origin of value and preference for one object, situation, or state of being within the vantage point of subjectivity (i.e. individuals, culture, etc.) Citing Brown (1984), Satterfield and Kalof argue that relativistic value studies assume preference “’to mean the setting by an individual of one thing before another because of a notion of betterness’”(Kalof and Satterfield, 2005, xxv). From this then it should be clear that the majority of contemporary social science research would fall within the relativistic tradition.

The second noteworthy classification of values research comes from Brown (1984). In accordance with Brown, many contemporary researchers draw a distinction between *held* and *assigned* values. Assigned values can be described as the process of evaluating or establishing the relative worth of an object in a particular context. Held values on the other hand could be described as culturally shared conceptions of ideals which prioritize certain modes of conduct. In some since then one might express this distinction as the difference between a social psychological value, and valuation. Clearly the two are related and there is frequently a relationship between them. None-the-less, the conceptual distinction is important especially considering the marked contrast between research into valuation and research into held values. Research into valuation for instance has often taken the form of contingent valuation and expressed preference studies.[23] Research into held values on the other hand is largely what the current review is centered on, and much of this research is rooted in basic insights detailed by Milton Rokeach (1973).

Rokeach’s approach conceives of value systems as “a relatively stable hierarchically organized set of beliefs that certain ideal *modes of conduct*

[23] See Fischhoff & Furby (1988)

(instrumental values) are preferable to other modes of conduct and that certain ideal *end states of existence* (terminal values) are preferable to other end states of existence" (Grube et al., 1994, 153). Furthermore, these values are understood to be cognitive representations of social and biological needs central to individual and collective survival (Rokeach, 1973). Grounded in these needs (and desires), values are hence limited in number. Clearly the two types of values (instrumental and terminal) are closely related, and in essence, instrumental values are to be thought of as in the service of terminal values. That being said though, Rokeach acknowledges that since there are multiple values, and further, they are arranged in a hierarchy of sorts, it is often the case that values come into conflict. Indeed, this value conflict becomes significantly important to the work of Schwartz (1992) who, has further developed the ideas of Rokeach.

Schwartz, drawing on both Rokeach (1973) and Kluckhohn (1951) defines values as "desirable, transituational goals, varying in importance, that serve as guiding principles in people's lives" (Schwartz, in Seligman et al., 1996, 2). In regard to value conflict Schwartz argues that attitudes and behavior are guided not by the priority given to single a value, but by tradeoffs among competing and contradictory values. In this sense then, it is in the presence of conflict that values are likely to be activated; "The total pattern of relations of value conflict and compatibility among value priorities gives rise to a circular structure of value systems" (Schwartz, in Seligman et al., 1996, 4). This circular structure of competing values consists of ten core value types. The ten values in turn are all organized around two dimensions. These higher order value types can be thought of as each existing on a continuum. One dimension is represented by a continuum with openness to change and conservation (traditionalism). This higher order value dimension "reflects a conflict between emphases on our independent thought and action and favoring change versus submissive self-restriction, preservation of traditional practices, and protection of stability" (Schwartz, in Seligman et al., 1996, 5). The second higher order value

dimension is represented by tension between self-transcendence and self-enhancement. This dimension "reflects a conflict between acceptance of others as equals and concern for their welfare versus pursuit of one's own relative success and dominance over others"(Schwartz, in Seligman et al., 1996, 5). This model has received significant empirical support in cross-national testing (Schwartz, 1992; 1994; Schwartz and Sagiv, 1995).

Further development of the Rokeachian and Scwhartzian framework has come from the work of Seligman and Katz, 1996; and Seligman, Syme and Gilchrist, 1994). These researchers argue however that the conventional treatment of value hierarchies has been too static. They suggest instead that values exist in multi-stable hierarchies. Indeed, a 2009 study confirmed that "value priorities change across situations when situational factors change. However, the way they change is guided by the level of value endorsement" (Howes, et al., 2009, 569).

Values in the Environmental Behavior Literature

Recall that this particular review is focusing its analysis of values more so within the realm of held values as oppose to assigned values. In this regard, there are three major efforts to make note of. First, and perhaps the most prolifically used typology is that put forth by Stern and Dietz (1994), Stern Dietz and Kalof, 1993). This framework identifies three value orientations referred to as social-altruistic, biosperic, and egoistic. Many studies have investigated this framework in relation to Schwartz's ten value types. Consistently, significant connections are found between Schwartz's self-transcendence dimension and the social-altruistic dimension. Secondly, Schwartz' model includes three items under the self-transcendence cluster that are comprised of values labeled unity with nature, a world of beauty, and protecting the environment. These in turn are consistently found to relate to the biospheric altruism dimension (Stern, P.C., 2000; Stern, Dietz, Kalof, and Guagnano, 1995)

A second typology of values related to the environment comes from Kellert (1996). Through extensive survey research, Kellert identifies what he referes to as nine basic values of nature and living diversity. Kellert's approach is a bit different from conventional social science in that his values structure is hypothesized to be a rooted in the evolutionary development (or human adaptation) that creates a profound craving for affiliating with nature and wildlife, biophillia. Clearly then this framework departs from some of the assumptions of the Rokeachian tradition. For Rokeach, and hence Scwhartz and others, human value systems emerge out of our need to satisfy human needs and desires. For Kellert, such values although they do emerge from human need are more so linked to our biological make up. Indeed, "These nine values, considered biological in origin, signify basic structures of human relationship and adaptation to the natural world developed over the course of human evolution" (Kellert, 1996, 26). Interestingly, Kellert's work exhibits a lot of potential for linkages with symbolic interactionsm. For instance symbolic interactionists' emphasis on emergence seems to be directly related to Kellert's position that "Learning and experience exert a fundamental shaping influence on the content, direction, and strength of these values".

Lastly, one of the more extensively researched (and debated) lines of environmental values research draws upon the work of Ronald Inglehart. Inglehart's theory is an attempt to bridge political economy, history, and cultural values. He does so using a framework derived from Maslow's theory of a hierarchy of needs, and the work of Walter Benjamin on Ideology.

In its original form, Inglehart's theory suggests that economic development in Western societies in the post World War II era has produced a shift in social values from largely materialist concerns to values with a more post-materialist emphasis. That is, "from giving top priority to physical sustenance and safety toward heavier emphasis on belonging, self-expression, and the quality of life" (Inglehart, 1990, 66). Valuation of the environment is included in the list of post-materialist values, and so, the well-known *post-materialist values hypothesis*

states that as a country's level of development increases, so too will that countries populace increasingly value the environment. Several studies have been conducted that empirically support this position (Lowe and Rudig, 1986; Inglehart 1990,1995, 1997, Gelissen, 2007). However, in the mid 1990's, research using data from alternative surveys, muddied the waters significantly (Brechin and Kempton, 1994; Dunlap and Mertig, 1995). The Dunlap and Mertig research found that of 14 total measures of environmental concern, 11 were significant and in fact seven of the 11 registered a negative association with national affluence. Indeed, this research directly challenged the post-materialist hypothesis which at that time had in many respects become conventional wisdom (Dunlap and York, 2008). Currently it appears as though post-materialist values (held values) do not relate to concern for the environment in the way originally theorized by Inglehart.

As can be seen from the above, research into values related to the environment and environmentally significant behavior is quite diverse. Recall, the discussion at the beginning of this section in which I argued that as an analytical construct, the concept of a value is quite useful for its ability to analytically navigate the tendency within society, (and hence the analysis of society), to experience the society-nature relationship in alienated terms. For instance, as can be seen from the work discussed here, certain human held values endow the non-human environment with intrinsic value. Recognizing and incorporating this into our attempts to analyze and understand the antecedents of environmentally significant behavior moves us beyond the problematic tendency within modern societies to artificially divide the human and social from the natural. That being said, there is one word of caution in this regard. Such theorizing seems to flirt with ideology. Indeed this danger is reflected in the significant debates and critique of the deep ecologist position on *wider identification* (e.g. Cronon and the wilderness debates).[24] Interestingly, it might

[24] Cronon, William (1995)

be the case that identity, while still having this ability to navigate the human-society divide, might not succumb to such analytical weaknesses. Specifically, intrinsic valuation of the environment for it own sake creates the obvious philosophical conundrum regarding the relative worth of nature versus humanity, Identity and Self avoid this trap. This is due to the fact that identity and self are constituted of both identification and separation.

Attitudes

The above discussion of values draws a distinction between values and valuation. This distinction in important for those reasons discussed above, however it is also important due to its close conceptual linkage with attitudes. Two of the most prolific researchers on the connection between attitudes and behavior define an attitude as a "Latent disposition or tendency to respond with some degree of favorableness or unfavorableness to a psychological object", and an object can be any discriminable aspect of an individual's world (Fishbein and Ajzen, 2010, 77). In relation to values then, there certainly seems to be some conceptual overlap between the *assigned* values as discussed above. Assigned values, a perception of the relative worth of something in relation to another, certainly seem to be subsumed to a large extent by the concept of attitude. Indeed, the question of whether there is room for the concept of a value or identity will be a theme in a later section of this review when I discuss the Theory of Reasoned Action (Ajzen, 1985; Ajzen and Fishbein, 1980) and its later extension into the Theory of Planned Behavior (Ajzen and Driver, 1991). For our purposes now though, it is apparent that a conceptual distinction between values and attitude, ambiguous though it may be, can be seen to reside in Rokeach's basic formulation of terminal values and Brown's (1984) held values. Whereas assigned, and instrumental values are attached to particular modes of conduct and other phenomena (i.e. objects) they could henceforth be subsumed within the definition of attitude. Instrumental and held values on the other hand, as

idealized end states of existence are much more difficult to think of as an attitude.

Another key distinction between attitudes and values relates to the degree with which the social and cultural collectivity is assumed to be connected to the construct. Counter to values theorists, attitude theory doesn't appear to explicitly theorize about a social or cultural connection. In this way, unless explicit effort is taken to formally connect the notion of an attitude to other social psychological constructs such as values and identities it largely remains a highly individually oriented analytic construct. It naturally follows then that contemporary research that attempts to connect attitudes to behavior incorporates attitudes into larger models that include additional elements such as norms and values. In the pages that follow, I will first try to nail down an operational definition of attitude through a brief discussion of the three most prominent branches of attitude theory. Secondly, I will review some contemporary approaches to the use of attitudes in modeling behavior, including environmentally significant behavior. Lastly I will offer an assessment and critique of the application of the construct of attitude in the environmental behavior literature.

Attitudes are one of the oldest and longest researched contemporary social psychological constructs. Interestingly, social psychologists in the early 20th century had "actually defined the whole of social psychology as the scientific study of attitudes" (Hogg and Vaughn, 1995, 108). One early definition is given by Allport in his *Handbook of Social Psychology* (1935). "The concept of attitudes is probably the most distinctive and indispensable concept in contemporary American social psychology" (Allport, 1935, 798). Given its long history it is no surprise that there are differing positions on what makes up an attitude. In fact one-way of thinking about the history of the social psychology is by considering attitude as a sort of umbrella concept that, although it still remains a cornerstone, has been subdivided into a series of conceptually distinct constructs such as values, identities, and norms. Indeed, such and interpretation would seem to be consistent with the tendency toward reductionism mentioned in

the introduction. This interpretation could also embody revolution in social psychology which emphasizes efforts to increasingly integrate multiple concepts and multiple levels of analysis. Indeed, in a critical article, Taylor and Brown (1979) argue that social psychology, "did not manage, in most of its theories and research, to contextualize individual or inter-individual social behavior within the framework of its wider social determination" (Tajfel, 1981, 41). As discussed in the introduction, this review is sensitive to this change and is an attempt to participate in the increasing integration of social and psychological variables of multiple levels into descriptive and predictive models of behavior. So what lies at the core of the concept of attitude as theorized within the broader social psychology literature? As will be seen below, different theoretical traditions within social psychology have developed such that researcher conceive of attitudes as being comprised of a single component, two components, or three components (Hogg and Vaughn, 1995).

The one component model of attitude can be traced to Thurstone's (1931) definition of an attitude as, "the affect for or against a psychological object" (Thurstone, 1931, 261). Some contemporary attitude theorists still operate within this basic framework, although it is important to point out historical changes in the usage of the word affect. Indeed, Fishbein and Ajzen (2010) point out that researchers in the early and mid 20th century would use the term affect to denote an attitudes valence or an individual's evaluation of some specific object, concept, or behavior as favorable or disfavorable, good or bad, positive or negative. From this perspective and attitude is an evaluation. They continue, and argue that much contemporary research conceptualizes affect to refer to mood and emotion, conceptually distinct from attitude, yet influencing overall evaluation. Hence, they suggest that, "theory and measurement have converged on a unidimensional conception of attitude" (Fishbein and Ajzen, 2010, 77). And so, in this regard, at the core of the single component model is the evaluation component. It is however important to note that related variables such as affect

and attitude strength are viewed as necessary considerations if attempting to apply the measurement of an attitude toward the prediction of behavior.

The remaining components of attitude as alternatively theorized, are, in fact, affect and then the intentionality or readiness to act (conation). As stated above, Hogg and Vaughan (1995) seems to imply that a two component model, evaluation and a readiness to act, is a model employed by contemporary researchers; however, this review struggled to find a researcher employing these two components without also including the third component of affect. And so the three component model of someone's attitude toward an attitude object in essence includes one's evaluation of the object, an affective or emotional response to the object, and readiness to act toward the object. Said another way, the three component model of attitude involves thought, feeling, and action. According to Hogg, this three component model is associated with Rosenberg and Hoveland (1960), Krech et al.(1962),and Himmelfarb and Eagly (1974).

A final distinction to be made relates not to the number of components contained within a given attitude, but instead, in relation to how these three components interact in order to form a given evaluation. Indeed, with the increasing use of confirmatory factor analysis, attitudes are increasingly being theorized as having complex and interactive structures. For example some contemporary researchers argue that, "affect, beliefs, and behaviors are seen as interacting with attitudes rather than as being their parts". That is, attitudes constitute a latent variable, existing and interacting with the various elements of the conventional tri-partite component model. As will be seen below, this view has come to characterize much of the most recent research into environmental attitudes as well.

Attitude in the Environmental Behavior Literature

And so, how have these various understandings of the structure of attitudes been implemented into research on environmentally significant behavior. Dunlap and Jones (2002), engage in an effort to sift through the body

of literature aimed at measuring *environmental concern.* Employing facet theory, their efforts are in part aimed at "mapping the conceptual space and empirical boundaries…thereby facilitating the development of adequate measurement of such concepts" (Dunlap and Jones , 2002 ,485). Through their research they identify several studies that explicitly attempt to apply attitude theory to the measurement of environmental concern. In doing so it is interesting to note however, that they offer a model of (environmental) attitude that is comprised of four instead of three components as discussed above. The authors suggest that in applying attitude theory to environmental concern it is useful to consider a cognitive (beliefs and knowledge), an affective (evaluative), a conative (readiness to perform), and a behavioral (actual or reported action taken) dimension. What is different from the broader social psychology literature here is the fourth dimension, actual or reported behavior. The authors include this fourth dimension arguing that "(environmental) concern can often be inferred from a person's overt actions, and also because behavior…has often been treated as an indicator of environmental concern in empirical studies" (Dunlap and Jones, 2002, 490).[25] This four component model also closely relates to Maloney and Ward (1973) who designed a *scale for the measurement of ecological attitudes.*[26]

Since Dunlap and Jones' review, significant developments have occurred in efforts to dissect the structure of environmental attitudes. Indeed, in the last few years "some important approaches to the structure of environmental attitudes have been proposed" (Milfont et al., 2010, 264). These developments have been in part due to the increasing application of the statistical technique of confirmatory factor analysis (CFA). The emerging technique was in fact recognized by Dunlap and Jones as offering great potential and they review two studies that had used the technique (Guber, 1996 and Carman 1998). One key development within this literature has been the increasingly common distinction

[25] Parenthetic text added
[26] This scale was conceived as having4-Dimensions: Knowledge, Affect, Verbal Commitment, Actual Commitment.

made between the horizontal and the vertical structure of environmental attitudes (Milfont and Duckitt, 2010; Milfont et al., 2010). Horizontal, in psychometric terms refers to the primary or first order factor(s) forming the structure of the attitude, and vertical refers to the higher order or second order factors. Whereas the horizontal structure is referring to the dimensionality of environmental attitudes, the vertical structure refers to the hierarchical structure of the attitude. Conceptually this would essentially suggest that people may hold distinct evaluations (attitudes) about different types of environmental problems (the horizontal/dimensional nature of environmental attitudes). In addition, these attitudes may be arrange in hierarchical order such that the lower order attitudes toward environmental problems may coalesce (beyond their dimensional orientation) around a hierarchical scheme of some form. At this point, most empirical research is suggesting that environmental attitudes are multi-dimensional (in their horizontal structure). However, there is less clarity in regard to their hierarchical ordering, with some research suggesting that there is only a single higher order organization pattern (Guber, 1996; Carman, 1999; Xiao and Dunlap, 2007). Alternatively though, several studies have identified the possibility of two higher order factors (Bogner and Wiseman, 2006; Wiseman and Bogner, 2003; Milfont and Duckitt, 2010). These researchers argue that the higher order dimension can be characterized by the terms preservation and utilization. Milfont and Duckitt (2010) for instance factor analyzed over 190 survey items taken from popular environmental attitude scales and found strong evidence of 12 distinct dimensions existing on one of two correlated second order factors that reflected preservation or utilization. Such findings would seem to provide sophisticated empirical support to an earlier theorization of environmental attitudes (i.e. Thompson and Barton, 1994), as being eco-centric or anthropocentric. Schultz (2000, 2001) conducted a CFA procedure as well, but found strong evidence for the distinction between three higher order factors, egoistic, biospheric, and altruistic concern.

The possibility that environmental attitudes are arranged within multiple dimensions and along a hierarchical order reflecting one's cognitions, affections, and conations about the general preservation or utilization of nature could potentially move environmental research forward in key ways. In particular, the more accurately researchers can map the mathematical and spatial structure of environmental attitudes (regardless of how many dimensions are ultimately identified), the more effective we can be at devising models that integrate multiple social psychological constructs into efforts to explain and predict environmentally significant behavior. That being said, this area of research is not without its faults. For instance, one significant weakness of attitude theory in general is relative lack of theorization regarding belief formation and knowledge. One of the three foundations of an individual's overall attitudinal evaluation is the cognitive understanding that he or she has regarding a given object. That being said, there has been significant research in the area of cognitive information processing, and causal attribution that expose the sometimes tenuous nature of cognitions. This is certainly recognized by attitude researchers who recognize that, "a multitude of variables could potentially influence the beliefs people hold", and that identifying relevant background factors and influences on belief formation can complement research on attitudes (Fishbein and Ajzen, 2010, 24).

On a more meta-theoretical level, one important commonality found in each of these frameworks is the fact that attitudes are contained within the individual, and they are in a sense, projected onto the object under question. And so to return to an earlier point regarding how there is a need for theorizing and empirical research that can cut across the typical society-nature divide, attitudes are significantly limited in this respect. Environmental attitudes by their very definition are evaluations of an object (environment) that exists out there. They are in this sense an analytical construct that presupposes such a separation. This makes it even more vital then to employ attitudes into integrated models that can provide the potential for navigating this divide. Such integration would also serve the purpose of promoting the type of multi-level analysis

discussed in the first section of this paper. Critiques aside, the benefit of the concept of an attitude is its relative proximity to behavior.[27] Specifically, where as identities and values are theorized and modeled as being distal influences on behavior, attitudes are most frequently positioned very close to the intention to behave in a particular way. It is in this way that attitudes are a valuable construct.[28,29] A last key distinction between attitudes and the other constructs investigated in this review is that attitudes are understood to be significantly more variable than identities or values for instance. That is, identities, values, worldviews, and beliefs are more stable and consistent elements of an individual's social psychological make-up. These constructs are viewed as spanning multiple situational contexts and remain somewhat stable over time providing individuals with a degree of continuity. Although researching on this level is beneficial in certain ways, it need not take away from the utility and importance of a measure such as an attitude which can often have significantly more conceptual and operational clarity. Again, one of the main themes of this review is the need for integrated and multi-level approaches to research in this area, and in this pursuit, environmental attitudes are vital component.

Worldviews

The final social psychological construct to be reviewed is the notion of *world views*. The concept of a world view is closely associated to the work of Thomas Kuhn (1962) and his book *The Structure of Scientific Revolutions*. In this book Kuhn argues that science experience dynamic change throughout history, change that is not characterized by the steady progression and accumulation of the findings produced by individual scientist. Instead, changes

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[27] Especially given the continued success that the theory of planned behavior is experiencing in predicting behavior.

[28] There has also been some research into the purely affective dimension of environmental attitude. Affect being defined less as an emotive evaluation and mores so as a somatic component characterized by some degree of arousal. Mayer & Frantz, (2004) connectedness to nature scale.

[29] Other related research: (Siegrist, 1998; Sjoberg, 2000; Marquart-Pyatt, 2008; Schan & Holzer, 1990; Kaiser et al., 1999).

in science are characterized by paradigm shifts, that is, a shift in the collectively held assumptions and beliefs that characterize the scientific community of a given era (Kuhn, 1962). This theme of paradigmatic shifts within the body of science was picked up by scientists within many disciplines as the issue of the environment and potential limits to growth occupied the scientific and political discourse of the late 1960's and 1970'.

This notion of paradigm shifts was taken up by the field of sociology as well. Drawing upon Kuhn's work, Klausner (1971) argued that conventional Sociology at the time operated within a paradigmatic world view that was implicitly human centered. Labeled the, Human Exemptionalism Paradigm, this theme was picked up later by Catton and Dunlap (1978) who argued that emerging within the sociology as practiced by some, were new sets of assumptions which stressed eco-system dependence and the ultimate embededness (within nature) of human societies. This proposed paradigmatic shift within sociology and the larger scientific community was termed the *New Environmental Paradigm* (NEP) (Catton and Dunlap, 1978). In this it was argued that, this new sociology was placing environment-society interactions at the center of analysis (Dunlap and Catton, 1979). They argued that, "to understand the full range of human interactions with the physical environment, environmental sociologists must consider cognitive, behavioral, and physiological interactions as well as the numerous combinations and permutations of them" (Dunlap and Catton, 1979, 254). This New Environmental Paradigm (Later to be termed the New Ecological Paradigm, Dunlap et al., 2000), in its earliest form, hinged on beliefs about humanities ability to upset the balance of nature, the existence of limits to growth, and humanity's right to rule over the rest of nature.

So just what is a paradigm? Indeed some have argued that the notion was quite ambiguous. As the concept developed however it became increasing well defined as it became conceived as juxtaposed to the notion of the *Dominant Social Paradigm* (Milbrath, 1989; Cotgrove, 1982; Dunalp et al., 2000). Capra for instance argued that a paradigm is, "a constellation of concepts, values,

perceptions, and practices shared by a community, which forms a particular vision of reality and a collective mood that is the basis of the way the community organizes itself" (Capra, 1986, 14). Milbrath (1989), drawing upon Capra's definition, argues that the Dominant Social Paradigm is, "a society's dominant belief structure that organizes the way people perceive and interpret the functioning of the world around them" (Millbrath, 1989, 116).

As can be seen there is a close connection, rooted in the historical and theoretical use of the terms, between a paradigm and a worldview. Consider, the following (significantly more recent) definition of a world view as, "Culturally transmitted comprehensive sets of assumptions about the universe, causality, humanity, ethics, nature, and supernature" (Meyers and Russel, 2003, 84). Still contemporarily, the distinction between a world view and a paradigm is ambiguous at best, and the two are often used synonymously.

It appears then world views are different from the other social psychological constructs in that the very conceptualization of the term grew in part out of earlier work on human-nature interactions. Perhaps one of the most important developments within the environmental behavior literature regarding worldviews is the near ubiquitous use of the quantitative scale measure designed to assess the degree to which an individual endorses the New Ecological Paradigm versus the Dominant Social Paradigm, the NEP Scale (Dunlap and Van Liere, 1978; Dunlap et al., 2000). Indeed, in a recent meta-analysis, the NEP scale was found to be the most widely used measure to investigate environmental issues (Hawcroft and Milfont, 2010). In their 2002 article discussed earlier, Dunlap and Jones assert that the concept of a paradigm, as embodied in the notion of the new environmental paradigm and the NEP scale, is increasingly being regarded as a comprehensive set of *primitive beliefs*, as theorized by Rokeach (1968). "A person's primitive beliefs represent basic truths about physical reality, social reality, and the nature of the self;…they are so much taken for granted that they do not come up as a subject for discussion or controversy"(Rokeach, 1968, 6). Alternatively the scale as it has been applied is often treated as an indicator of

general environmental beliefs, (Dietz et al., 2007), or beliefs, attitudes, intentions, and behaviors (Milfont and Duckitt, 2010). Clearly, these conceptualizations take much of the theoretical power out of seeing the NEP as an indicator of paradigm endorsement. And in fact, this has indeed been the subject of debate. Not without critique, (Stern et al., 1995; Reser and Bentrupperbaumer, 2001), Dunlap et al., (2000) in their revision of the original scale find that, "it is appropriate to treat the new set of 15 items designed to measure endorsement of an ecological worldview as constituting a single 'New Ecological Paradigm Scale'"(Dunlap et al., 2000, 438).

Whether the NEP is treated as measuring world views or instead a form of attitude, in part depends on the degree to which the researcher is committed to traditional attitude theory. As will be discussed below, attitude theory in many ways treats beliefs and attitudes as coconstitutive. Still, I would argue that drawing a conceptual distinction between an attitude and a world view is important. It seems clear that a worldview as a primitive belief or paradigm, is substantively different from an attitudinal belief. Indeed, this position appears to be supported by qualitative research on "Cultural Models" (Kempton, et al., 1995, ch.3). More recent research as well supports this position.

Schultz and Tabinaco (2007) draw on Rokeach's concept of primitive beliefs to test a model grounded in Bem's (1970) theory of self-attribution. They argue that, "the primitive belief will serve as a latent source for the development of specific concerns" (Schultz and Tabinaco, 2007, 1222). In this way, the researchers conceive of the meanings attributed to the self to parallel Rokeach's primitive beliefs. That is, the, "an individual's belief about his or her relationship to the natural environment is on such zero-order primitive belief" (Schultz and Tabinaco, 2007, 1221). In order to test for this *implicit association*, the researchers employ an implicit association test (IAT). An IAT test is specifically

designed to illicit responses that lie beyond the cognition of the individual.[30] Some interesting findings emerged from this research. First, there is some evidence that the items that comprise the implicit association tests measure an underlying social psychological construct. Second, an implicit connection with nature was found to increase after spending time in a wild animal park. Furthermore, difference of means t-tests suggested that women on average have higher implicit connections with nature than men. This supportive evidence aside, the tests did not translate into significant differences in explicit concern for environmental issues (Schultz and Tabanico, 2007). Still, research that continues to operationalize world views and primitive beliefs should continue so that we may uncover more details about the connection world views may have with other social psychological constructs.

It should be noted however that, in this study, the researchers conceptualize these primitive beliefs as a particular cognitive dimension. One concern about this research agenda is that it may in actuality represent a move away from conceptual clarity. That is, it seems to be the case that one of the underlying components of the self and identity involves a conscious and active internal dialogue which helps to organize the self, thus establishing a degree of continuity that can form the basis of action. Such self meanings, as theorized above, would seem to be more appropriately conceptualized as worldviews. Interestingly, the authors draw on Dunlap et al., (2002), but move away from seeing these primitive beliefs as worldviews and instead opt for attributing them to the self. By casting this construct as a cognitive dimension of identity (even though by its very definition cognition is not required) it significantly muddies the waters regarding what an identity is and how it might be related to other social psychological constructs.

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[30] For a review of this method, see Greenwald, A.G., Nosek, B., & Banaji, M. (2003) "Understanding and Using the Implicit Association Test: I. An Improved Scoring Algorithm" *Journal of Personality and Social Psychology*, 85:197-216,

Integrated Hierarchical (multi-level) Models

The final two social psychological constructs that fall within the parameters of this review, beliefs and norms, will be discussed in section three, as each must be discussed in some detail in order to review the most widely used models that attempt to integrate multiple constructs into investigations of environmentally significant behavior.

Research and theorizing that combines social psychological constructs into theories designed to explain and predict environmentally significant behavior spans nearly four decades now. This section will begin by detailing each of the major streams of research in this area, addressing first the theoretical frameworks employed and then secondly the empirical findings uncovered by each. However, before all of this, there is an important methodological consideration to take note of. Namely, a majority of the research that will be discussed below do not engage in research projects that attempt to measure actual behavior. Indeed, it is much more of then the case that a given study will measure self reported behavior, or perhaps even more frequent are studies that measure behavioral intentions. This is a significant distinction because a host of methodological and measurement considerations come into play. For example, one key when relying on self reported data is to make sure that a clear definition of the behavior in question has been established. In this way, "The challenge is to ensure that all participants have the same definition and understanding of the behavioral category and that their definition matches that of the investigator" (Fishbein and Ajzen, 1975, 33). There are a host of other important measurement issues to consider as well some of which will be addressed in the final section of this review.

Most of the research in this area appears to have converged around one of two integrated theoretical models, the Theory of Reasoned Action/Planned Behavior (Fishbein and Ajzen, 1975, Ajzen and Fishbein, 1980; Ajzen, 1985), and Schwartz' Norm Activation Theory (Schwartz, 1968, 1977), as well as its integration into a more recent model Value-Belief-Norm Theory (Stern et. al.,

1999). In the following pages I will detail each of these theories, as well some of the key empirical works that have employed them.

I will first begin by discussing the application of Schwartz' theory of universal value systems (1992, 1994) and his norm activation model of altruism (1968 and 1977). As discussed above, for Schwartz, values consist of desirable, transsituational goals, varying in importance, and serving as guiding principles in people's lives. Recall from above Schwartz' emphasis on the role of conflict in values systems. Value systems it is argued are arranged in a circular structure of competing values. The theory asserts the existence of 10 universal value types which cross-cultural research suggests seem to cluster into four distinguishable and opposing clusters: Openness to change/Conservation and Self-transcendence/Self-enhancement).[31] There are a number of studies that legitimate this organizational model (Oishi, Schimmack, Diener, and Suh, 1998); Schwartz, 1992, 1994; Spini, 2003). Of particular importance to environmental research has been the dimension of self-transcendence in opposition to self-enhancement. Karp (1996) for instance, found that concern for the environment correlated positively with self-transcendent values and negatively with self-enhancement values.

In combining these two elements of Schwartz' work in order to explain and predict behavior, the theory suggests that individuals who hold values that fall closer to a self-transcendent (i.e. concern for the welfare of others) orientation, will be compelled to behave in altruistic fashion, given certain circumstances. Such an altruistic norm will likely be activated, provided the self-transcendent person is aware of some potential harm to others. Furthermore, he or she must ascribe responsibility to him or herself for the condition of the other in harms way. In more formal terms, the relationship between values and behaviors is hypothesized to be moderated by an individual's awareness of consequences

[31] These value types are usually assessed with 56 survey items.

(AC), and the degree to which they ascribe responsibility (AR) for the consequences to themselves.

This basic framework describing the relationship between value orientations and behavior has been used effectively in many studies of environmentally significant behavior. Some of the first studies to employ the norm activation model were conducted in the 1970s (Heberlein, 1972 and Heberlein and Black, 1976). In these studies, norm activation was found to effectively explain behavior related to littering and the purchase of unleaded gasoline. More recently however, Stern and colleagues have slightly modified and extended this model to specifically target research into environmentally significant behavior. Building off of a published discussion between Heberlein and Dunlap and Van Liere, Stern et al. (1993) suggested a model of value structure containing three dimensions, egoistic, humanistic, and biospheric (discussed above). Furthermore, Stern and colleagues continue the development of this model into one that attempts to map the indirect links between values and environmental behaviors (Stern 2000; Stern et al., 1999).

Value-Belief-Norm theory, as it is called, has seen fairly widespread use in empirical work addressing pro-environmental behavior. At its core, this framework posits that value orientations influence general beliefs about the relationship between humans and the environment.[32] These general beliefs are posited to then influence specific beliefs about the consequences (AC) from given behaviors, and the ascription of responsibility (AR) to the individual engaging in the action. This sequence of direct and indirect effects of values on beliefs, and henceforth the activation of norms has stood up to empirical testing in relation to a wide array of behaviors. Using SEM, Dietz et al. (2007) used the model to effectively predict support for climate change policy. Indeed, in this study the V-B-N model explained nearly two-thirds of the variance in policy

[32] General beliefs are often operationalized through the endorsement of the NEP (Dunlap & Van Liere, Dunlap et al.,2000).

support. Another study, Kaiser et al. (2005), used the model to effectively predict a set of conservation behaviors.

Beyond the V-B-N model, there are other contemporary researchers using (and extending) the basic Scwartzian model. In an interesting 6 nation cross-national study, Schultz et al. (2005) find a modified version of the norm-activation model significantly predicts a host of personal pro-environmental behaviors (re-using, recycling, picking-up litter, etc.). As expected, AC and AR moderated the effect of holding a self-transcendent value on the dependent variable. However, the findings only held in four of the six sample countries. This finding mirrors some previous cross-national research (four country sample) which however found little evidence of the suggested moderating effect (Schultz and Zelezny, 1998).

Lastly, the Schultz et al., study is interesting because it loosely incorporates the conceptualization of identity and self into the analysis. To do so, the researchers broke the self-transcendence value items up, and targeted only the universalism items. The universalist component of self-transcendent values is largely thought to be the particular space where concern and care for the environment resides, in part because protecting the environment and achieving harmony with nature are two of the items contained within this dimension. However with these items removed, the modeled effects remained. These results in effect, suggest that self transcendence and care for others in a more general sense, share a relationship with engagement in pro-environmental behaviors. The authors then postulate that this relates to the possibility that concern for the environment can be thought of as expressing a concern for the self, other humans, or nature in itself. And this in turn is related (through self-transcendance) to the degree of connection perceived between the individual and others, including nature (Schultz et al., 2005). This line of research will discussed in the last section of this review as it is closely related to the integrative model that will be proposed.

Beyond the Scwhartzian based value and norm activation model, there is another key framework that attempts to integrate multiple social psychological constructs into investigating environmentally significant behavior. This is the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1975:1980) and its later refinement, the Theory of Planned Behavior (TPB) (Ajzen, 1985).
Foundationally, this tradition of theory maintains that the most proximal influence on behavior is *behavioral intention.* Behavioral intentions are seen to be a function of attitudes and subjectively held norms. The distinction between TRA and TPB lies in an additional antecedent to behavioral intension proposed by Ajzen (1985), an individual's perceived behavioral control. First let's discuss each component element briefly, and then we will consider some of the empirical literature on environmentally significant behavior that adopts this model.
As mentioned above, one's attitude toward a given behavior can be understood as his/her favorable or unfavorable evaluation of the behavior. Further, attitude toward a particular behavior is theorized to be influenced by his or her belief about the probability of the behavior producing a given outcome, and their evaluation of the believed outcome resultant from the behavior. This, the expectancy-value model of attribution and attitude formation and structure (Feather, 1959 and 1982), holds that *expectancies* equate to an individual's subjective assessment of the likelihood that a particular attitude object possesses a given attribute. The given attribute as well is ascribed (by the subject) a certain *value*. Attitudes toward an object are formed automatically as new beliefs are formed about an object. This is because, people are assumed to have preexisting evaluations of the attributes that become linked to an object in the process of belief formation. The attribute evaluations thus become associated with the attitude object. (Fishbein and Ajzen, 2010). It follows then that:
$A = \Sigma\ bi\ ei$ *(attitude equals the sum of the strength of the belief that the attitude object has attribute I, and the evaluation of the attribute i)*

The subjective norm component involves the individual's perception of the expectations and pressures from significant others to support or perform the

given behavior. Further, subjective norm is thought to be influenced by normative beliefs regarding specific important others (normative referents), and the degree to which the individual is motivated to conform to the normative pressures of these others. It is important to note that norms can be thought of as two types, injunctive or descriptive (Cialdini, Reno, and Kallgren, 1990). Injunctive norms can be thought of as an individual's perception of, what ought to be done, whereas descriptive norms are understood as an individual's perception of what others are doing.

The third distal factor thought to influence behavioral intention, and hence actual behavior, is perceived behavioral control.[33] Perceived behavioral control can be understood as the extent to which people feel they have control over whether they can do the behavior or not. This is in turn shaped by the perception of the presence of factors that may either impede or facilitate execution of the behavior. Although some have argued that this third component may have several dimensions related to whether the individual's perception of any lack of control is attributed internally or externally, Fishbein and Ajzen do not see it as such. "Whether these resources and obstacles are internal or external to the person is immaterial" (Fishbein and Ajzen, 2010, 169). Lastly, sometimes included in the model is an element of actual behavioral control, or the extent to which the actual resources for conducting the behavior are available to or possessed by the individual in an objective sense. (Ajzen, 1985:1987).

The TPB model has been applied to a diversity of environmentally significant behaviors. In a 1999 study of recycling behavior, Cheung et al., found significant effects for all the components on behavioral intention. In this study of college students, attitude produced the largest effect size (beta = .43), followed by perceived social norm (beta = .27), and then perceived behavioral control (beta = .21). Another study applied the TRA model to the question of voting behavior in relation to a proposed dam project (Routhe et al., 2005).

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[33] This element of the theory is what separates TRA from TPB, added by Ajzen in 1985.

Interestingly, this study combined the conceptual framework of environmental concern discussed above (Dunlap and Jones, 2002), in which such concern was assessed using the three component model of attitude theory. The net result was a total explained variance in behavioral intension to support the dam project of .62. Substantively, the study concluded that, "residents who are more likely to engage in activities that would demonstrate their support for building a dam think it is a good idea (attitude), believe it will result in more positive than negative outcomes(behavioral beliefs), feel a general social pressure to support its construction (subjective norm), and believe specific significant others also support building a dam to meet water supply needs in the country (normative beliefs)" (Routhe et al., 2005, 887).[34]

Among these and other studies, there has also been significant research within the TRA and TPB general framework that has attempted to extend the model by the addition of a measure of self-identity. Much of the impetus for this move within the literature stemmed from a desire by researchers to incorporate a moral norm component into the model, thinking that this would help to explain a significant portion of the residual effect of past behavior on behavioral intentions (Fishbein and Ajzen, 2010). In this sense, identities are proposed to be directly related to norms through the moral inclusion of others into a like community. That is, identification of self with some other, henceforth comes to construct the particular descriptive and injunctive norms that will in turn influence behavioral intention. Still others argue that self-identity may involve affective components (i.e. emotional connection of the self to others) of evaluations that are insufficiently measure in the standard attitude component of TPB. The question thus becomes are these effects fully mediated or are there unique and direct effects of self-identity on behavioral intention. The architects of the TPB and TRA theories argue that their framework is open to the addition of variables that significantly increase the variance explained in behavioral intention.

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[34] The distinction made in this study between subjective norm and normative beliefs equates to the distinction made between descriptive and injunctive norms respectively.

Interesting findings to this question have been unfolding for about the last twenty years. Many recognize Sparks and Shepherd (1992) to be one of the first to incorporate a measure of self-identity into the TPB model. There does appear to be two prior studies (Charng et al., 1988; Biddle et al., 1987), however reviews of these works have suggested that there were significant measurement problems, calling the validity of their results into question. However, in the Sparks and Shepherd (1992), self-identity as a green consumer was found to significantly predict the behavioral intention to purchase organically grown produce over and above the measures of attitude, subjective norm, and perceived behavioral control. A latter study of recycling identity produced similar results (Terry et al., 1999). However, evidence to the contrary has been documented as well (Conner and Flesch, 2001).

Perhaps the most theoretically informed (at least in regard to identity theory) research in this regard comes from Fekadu and Kraft, (2001). Recall earlier the assertion that interest in self identity within TPB was in part motivated by interest in the finding that past behavior somehow predicted future behavioral intention. As an identity theorist, such a finding is rather obvious. As discussed in the earlier review of identity and self theory, efficacious action constructs future identities. So, through acknowledging that, "identity theory assumes the presence of such moderation effects for past behavior", Fekadu and Kraft (2001) were able to test and document just such an interaction. The authors thus conclude that, "it may generally be concluded that the TPB is not necessarily a 'sufficient model' for tapping all types of cognitive information needed for describing the process of intention formation" (Fekadu and Kraft, 2001, 683). A recent meta-analysis of self-identity TPB studies, many of which included pro-environmental dependent variables, further supported this conclusion (Rise et al., 2010).

These successful attempts at integrating self-identity into the TPB and TRA models aside, there is still significant hesitation toward consistent inclusion of the construct within the theory. This is part results from inconsistent findings.

A significant reason for the inconsistent findings in regard to the contribution made by self-identity likely relates to weak conceptual and operational definitions of identity in the empirical research. "For one-thing it is not at all clear that the measures used have much to do with self-identity in that they do not really address a person's identification with a social group or with a social role" (Fishbein and Ajzen, 2010, 293).

To conclude this discussion of contemporary integrated models of environmentally significant behavior, it seems important to address two primary questions. The first question relates to the degree with which these models integrate multiple social psychological constructs and ideas. In this regard, both versions of the norm activation models do well to integrate values, specific beliefs, norms, and attitude into their framework. Likewise, the body of research that has pursued TRA and TPB models has done well to encompass the influence of attitudes, beliefs, and norms within their predictive framework. The effectiveness of both is witnessed by the large R-squared values reported above. Furthermore, research in the TRA and TPB tradition have made significant strides toward incorporating other constructs such as self-identity, however, much work still needs to be done in this regard.

Beyond these developments, there seem to be two key critiques regarding these widely used integrative models. The first, briefly discussed above, relates to the treatment of belief within the TPB framework. Namely, there is too strong of evidence regarding the myriad explanatory factors affecting belief formation and causal attribution to leave beliefs and their determinants as under theorized as TPB theorists have done. Granted, many of the V-B-N models include variables measuring trust in government or science and this is to their credit; however significant improvements could be made in both. This could likely be a function of the relative little communication that exists between these social psychological studies of *pro-environmental behavior*, and social psychological studies of risk and risk perception. This is likely an area for future research.

The second critique however, a more substantial one, was introduced in the first section of this paper, is that both of these frameworks are guilty of falling victim to the overly individualist orientation that social psychological research often takes. This critique is perhaps more true for the TRA and TPB models as virtually no effort is made empirically or theoretically to move the analysis to the social level. Even within the norm-activation models however there is not consideration of inter-group dynamics worked into the analysis. That is, although frameworks such as the V-B-N theory incorporate collectively held and culturally specific concepts such as values and worldviews into their mathematical models, the studies that use these models seldom engage the question of value conflict or intergroup relations that are characteristic of social life. In this way, these analyses remain on the narrowly individual level. And so, both frameworks seem weak in regard to the multi-level analysis characteristic of research into identity.

CHAPTER III THEORY

Conceptual and Theoretical Foundations for Ecological Identity

Overview

This dissertation proposes and tests an **Ecological Identity Scale** (EIS) that attempts to overcome major methodological, conceptual and theoretical weaknesses in the research on identity in relation to nature and the bio-physical environment. It does so by developing a framework built upon a foundation that connects methodological, conceptual and theoretical facets of identity into a more integral model termed ***Ecological Identity*** (EI). This chapter begins by critically examining major theoretical frameworks that have been used to measure environmental identity pointing out their theoretical similarities, differences, and potential for integration. Next it discusses the theoretical foundations that the EIS has been built upon, describes the dimensionality of EI, and lists specific hypotheses that were tested. The final section presents a model of ecological behavior that is also explored in this dissertation. This model integrates Ecological Identity with other more established theoretical constructs and is used to test specific hypotheses associated with this type of behavior.

Background

As discussed in the literature review (Ch. II) there have been two major attempts to design valid and reliable scales of environmental identity. It was noted as well that in addition to a methodological weakness (e.g. limited coverage of content area of environmental identity), these measures have two readily identifiable theoretical weaknesses. The first relates to the fact that each measure is grounded in a different theoretical tradition. Whereas Stets and Biga (2003) draw upon Identity Theory (see McCall and Simmons, 1978; Stryker, 1980; Burke and Stets, 2009) to construct their *'environment identity'* scale, Clayton (2003) grounds her *'environmental identity'* scale in Social Identity

Theory (see Tajfel and Turner, 1979; Tajfel, 1981; Hogg and Abrams, 1988; Hogg, 1992).[35] This results in each operating on a different conceptual level of analysis; one individually-based, and the other socially-based. And so, despite the fact that each scale carries roughly the same name, they target conceptually distinct aspects of identity. This EI framework put forth in this dissertation offers a way to synthesize the two theoretical traditions.

The second and related theoretical weakness of the existing measures relates to what McCall (2003) refers to as the "positive and negative poles of identity" (pg. 12). Specifically, McCall and others argue that identifying ***with*** some social object (e.g. a role, group, etc) logically entails ***dis-***identifying with other social objects that differ from that one. Moreover, this dis-identification is an important feature within the identification process. Each of the existing measures are exclusively focused on identification ***with*** nature and the biophysical environment and fail to address dis-identification. It seems important to examine how dis-identification may contribute to environmental identity because many theorists argue that it is through the processes of dis-identification and differentiation that power is most often exercised (Weigert, 2010; Jenkins, 1996; Burkitt, 1991). Each of these weaknesses and how EI attempts to overcome them is addressed in greater detail below.

The existing measures of environmental identity are grounded in separate theoretical traditions and thus, offer only a limited or partial view of identity. In particular each operates on a different conceptual level of analysis. Identity Theory (IT) is analytically focused on an individual role-based level, while Social Identity Theory (SIT) is analytically focused on a social category-based level. These different levels of analysis will be detailed below, but first it is important to acknowledge that despite these differences both these theories share some fundamental assumptions. Both are interested in analyzing the reciprocal links between the individual and society and, "the way in which identities are

[35] Also referred to as Self-Categorization theory (Turner et al., 1987), the theories are largely considered a part of the same larger body of theoretical work, Social Identity Theory.

internalized and used to define self" (Hogg et al., 1995, 262). And both use the concept of salience to address the activation of identities. Salience can be generally defined as the probability that an identity will be invoked in a given situation (Oakes, 1987; Stryker, 1980). Although both theories have explored various aspects of identity salience in somewhat different ways Stets and Burke (2000) assert that, "the different ways are not mutually exclusive"…and, "…they may complement each other" (pg. 231). Finally, these theories do not differ in terms of the general outcome of identification. That is, each assumes that identities are internalized definitions of the self, that lead to particular behavioral, attitudinal, and normative outcomes. With these similarities, integration of the two seems warranted. In fact, there has been a recent trend within the broader social psychological literature toward *multi-level identity analysis* by creating greater connections between IT and SIT (Owens et al., 2010; Deaux and Martin, 2003; Stets and Burke, 2000; Thoits and Virshup 1997; Jenkins, 1996; Hogg et al., 1995). Indeed, Stryker (2008) points out that, "One of the more interesting debates…involves the distinction between social identity and role identity" (pg. 24). And so, by incorporating aspects from both of these theoretical traditions, the EI framework developed in this dissertation offers a more integral theory of Identity which has the potential to advance not only environmental research, but the broader field of social psychology as well.

So what is to be made of these two theoretical traditions, and the different conceptual levels of analysis upon which they operate? While the similarities noted above make integration possible, it is the conceptual distinctions between IT and SIT that provide an analytical richness worthy of exploring. The essential distinction lies in the source of the internalized self-definitions that form the basis of an identity. In the case of IT meanings are attributed to the self, through a process of taking on the role of significant others, whereas in the case of SIT meanings are attributed to the self through group membership. To further explain this distinction, each theory is discussed below.

The framework of environmental identity developed by Stets and Biga (2003) is grounded in Identity Theory (IT) a product of the North American Symbolic Interactionist tradition. Within this tradition identities are directly linked to ***roles***; "identities are …self cognitions tied to roles, and through roles, to positions in organized social relationships" (Stryker, 2008, 20). A role can be generally defined as a set of behavioral and dispositional expectations. Individuals 'take on' a role within the group and incorporate into the self, the meanings and expectations associated with that role and its performance (Thoits and Virshup, 1997; Burke and Tully, 1977; Thoits, 1986). Identities on this role-based conceptual level of analysis place the individual in some meaningful web of relationships with others. Moreover, recognition of these relationships compels the individual to internalize a set of role-expectations that provide a sense of distinct individual identity that links the individual to the group. Importantly, the group in IT is conceptualized, "as a set of interrelated individuals, each of whom performs unique but integrated activities, sees things from his or her own perspective, and negotiates the terms of interaction" (Stets and Burke, 2000, 228).

Coming from this tradition, the environmental identity framework offered by Stets and Biga (2003) is focused on identification with the environment, as it occurs through *an individual's internalization of beliefs about the self and the role he or she is to play in relation to the environment.* It describes a situation in which someone defines themselves as interrelated with nature and the wider environment, and expected to behave in particular ways in order to preserve these valued relationships. Thus, having an environmental identity means, taking on the role of nature and the wider environment, constructing an understanding of the relationships one shares with it, and attributing a set of unique role-expectations to the self (cf. Weigert, 1997). There is a long empirical research record of IT effectively explaining role-based behavior with regard to conformity, self-verification, role-negotiation, etc. (see Owens et al., 2010). Consequently, incorporating Identity Theory into our model of EI has the potential

to improve our understanding of how the roles related to ecological identity and other factors drive pro and anti-environmental behavior.[36]

In contrast to the Stets and Biga (2003) framework, Clayton (2003) grounds her *'environmental identity'* scale in Social Identity Theory (SIT); an outgrowth of European Social Psychology. SIT focuses attention on self-categorization and intergroup comparison, and how membership in a social or group or category (e.g. nationality, race, gender, etc…) defines who one is in terms of various group characteristics. Specifically, group membership ascribes attributes to people considered members of that group (e.g. what one should think and feel, and how one should behave).[37] According to SIT, once the self is categorized, two important socio-cognitive processes take hold, depersonalization and meta-contrast.

Depersonalization is the idea that, once the individual is categorized as a group member he or she begins to, "act as embodiments of the relevant in-group prototype rather than as unique individuals"; analytically, this implies, "a contextual change in the level of identity (from unique individual to group member)" (Hogg et al., 1995, 261). The second socio-cognitive process that results from self-categorization is ***meta-contrast***. Meta-contrast is the idea that, once the self is categorized, individual perception and the processing of information is driven by attempts to accentuate perceived similarities between the self and other in-group members, and perceived differences between the self and out-group members (i.e. accentuation of difference). Moreover, it is assumed that these contrasts between groups are used enhance the self by constructing

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[36] It is important to note that the depiction of IT in this dissertation largely reflects a more structuralist version of the theory. This version is primarily the version put forth by Stryker, Stets, Burke and others. However McCall and Simmons (1979) originally conceived of a more subjective socio-cognitive version. This version has received less attention over the last few decades, especially within the quantitative Social Psychological literature. Furthermore, given that Stets & Biga (2003) draw largely on the more structuralist version, it is appropriate to prioritize it here. It is also important to note that Stets & Biga (2003) although working within IT, conceive of environment identity as a *person identity*. The concept of person identity is a recent outgrowth of the broader identity theory described here, and "has not been given much empirical attention in identity theory" (Stets & Carter, 2011, 193).

[37] Importantly, membership can be ascribed or achieved (See Jenkins, 1996).

positive evaluations of the in-group, and negative evaluations of the out-group. According to SIT, these socio-cognitive processes belie group phenomena such as stereotyping, cohesion, empathy and altruism; and in this way, behavior is thought to be influenced by the normative structure of a society.

Coming from this tradition, Clayton's (2003) framework of environmental identity is focused on self-identification as a group member, agreement with an ideology associated with the group, and positive evaluations of the group. From this perspective, having an environmental identity means seeing oneself as an environmentalist and a part of nature (self-categorization), acting as an embodiment of nature and environmentalists (depersonalization), and positively evaluating both environmentalists and nature (meta-contrast and enhancement).[38] Like IT, SIT has a long empirical record of research effectively explaining intergroup behavior and social-cognition (Abrams and Hogg, 1999). Consequently incorporating Social Identity Theory into our model of EI has the potential to improve our understanding of how self-categorization and intergroup comparison relates to ecological identity and other factors driving pro and anti-environmental behavior.[39]

According to Stets and Burke, one way to summarize the differences between these two theories that could lead toward their integration is to consider the different way each conceptualizes the notion of *group*. "Social identity theorists regard the group as a collective of similar persons all of whom identify with each other, see themselves and each other in similar ways, and hold similar views, (all in contrast to members of out-groups). Identity theorists regard the group as a set of interrelated individuals, each of whom performs unique but integrated activities, sees things from his or her own perspective, and negotiates

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[38] Importantly, Clayton does not effectively incorporate the concept of meta-contrast into her theory nor her scale. Although she accounts for positive evaluations of the ingroup (i.e. environmentalists and nature), any salient out-group that to contrast with is absent. This will be returned to in a late section of the chapter.
[39] It is important to note that although Clayton explicitly claims that her scale is based on Social Identity Theory, there is much room for critique in this regard. For instance, the idea of meta-contrast and out-groups occupies relatively no place in her framework. This will be addressed in greater detail later in the chapter. Still aspects of the broader theory are drawn upon.

the terms of interaction" (2000, 229). This difference in conceptualization of the group is significant because it steers the focus of analysis in different directions. Stets and Burke (2000) highlight this contrasting focus arguing that *Identity Theory emphasizes individuality and the meanings attached to self as a unique member of an interrelated group*, while *Social Identity Theory emphasizes the meaningful similarity and uniformity of perception and action that result from self-categorizing as a group member*. "Thus, a role-based identity expresses not the uniformity of perceptions and behaviors that accompanies a group-based identity, but interconnected uniqueness" (Stets and Burke, 2000, 227).[40]

Recognition of this difference in conceptual focus becomes important in empirical research, because it implies different units of analysis. The unit of analysis in IT, is individual-level understandings of the meanings attributed to self as a unique person occupying a particular role position within a group (e.g. what is my role in relation to nature and the biophysical environment?). On the other hand, SIT taps into the meanings that an individual attributes to themselves given their membership in particular social groups or categories. Thus the unit of analysis is individual understandings of the meanings attributed to groups and social categories. (e.g. What are the attributes of environmentalists, and do you consider yourself one?).[41] Each of these levels of analysis can offer important insights into identity dynamics, and incorporating them both into a more integral theory of Ecological Identity is a primary goal of this dissertation.

In addition to the need to integrate these two theories, there is a second theoretical weakness. Both conceptualizations of environmental identity focus on identification ***with*** nature and the biophysical environment and fail to acknowledge that identification ***with*** an in-group, is often a product of ***dis***-

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[40] Interesting connections have been made between the different types of identity (role & social), and Durkheim's notion of Mechanical and Organic Solidarity (Stets & Burke, 2000). These connections will be discussed in greater detail in the 2nd and 3rd chapters of the dissertation (Literature Review & Theoretical Framework).

[41] Thoits and Virshup (1997) have argued succinctly that the differences between the two originated in a view of the group as the basis for identity (who one is), and the role as a basis for identity (what one is expected to do).

identification ***from*** an out-group. Indeed, the frameworks put forth by both Stets and Biga (2003) and Clayton (2003) each assess whether and in what ways individuals think of themselves as, "connected to", "a part of", or otherwise sharing some affinity with nature and the biophysical environment (Stets and Biga, 2003, 409; Clayton, 2003, 52). Interestingly, each of the theoretical traditions (IT and SIT) that undergird these frameworks acknowledge that identification ***with*** in-groups, categories, or like others is only part of what constitutes a given identity; and identification also involves an active dis-identification from out-groups, categories, or ***salient oppositional others*** (Weigert, 2010; McCall, 2003; Jenkins, 1996; Tajfel, 1981).[42]

Although it is not recognized in either of their works, Symbolic Interactionists have long recognized that, "Identity is established as a consequence of two processes, apposition and opposition, a bringing together and setting apart" (Stone, 1962, 94). Indeed, the setting apart or ***differentiation*** of the self from oppositional others through identity is necessary for meaningful action to occur. As Blumer argues, this distance allows individuals to "check action toward objects and indeed work out new lines of conduct toward them" (Blumer, 1969, 70). Similarly, the concept of meta-contrast within SIT (see above) explicitly suggests that group-based identities are formed and maintained in part through accentuating differences between the self and out-group members. Still, this aspect of the theory is largely absent from Clayton's (2003) theoretical framework and Environmental Identity scale.

The absence of this aspect of identity is problematic within the work on environmental identity because many theorists argue that it is through the processes of dis-identification and differentiation that power is most often exercised (Weigert, 2010; Jenkins, 1996; Burkitt, 1991). Differentiation involves the projection of meaning onto 'others', a process that has been shown to lend itself toward prejudice, discrimination, and control (cf. Tajfel, 1981; Adorno, 1998;

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[42] In this way, addressing this weakness can further help to integrate SIT and IT, by connecting concepts that have until now been exclusive to one theory or the other.

Jenkins, 1996; Hogg et al., 1995). That being said, the existing scales of environmental identity can be critiqued for failing to acknowledge the role of power, conflict, and difference in the process of identification with nature and the biophysical environment. On an individual role-based level of analysis, assessing how differentiation may contribute to EI can help to identify the types of behavioral dispositions thought to be anti-environmental, and hence avoided. On a social category-based level of analysis, assessing differentiation can offer important insights into social groups thought to be anti-environmental and the way power is used in issues of environmental conflict.

In attempting to address each of the weaknesses noted above, this dissertation conceptualizes ecological identity (EI) as *the extent and ways by which an individual views him or herself as part of an integrated social and biophysical (i.e. ecological) system characterized by interconnected processes and relationships.* The EI framework is constructed in such a way that it is capable of synthesizing aspect of symbolic interactionist Identity Theory (IT) and Social Identity Theory (SIT) into an integral model that accounts for both the individual-role based and social category-based levels of analysis the self. The framework is also conducive for integrating similar concepts from IT and SIT that address how power and conflict are exercised through the differentiation of the self from oppositional others and out-groups. Figure 3.1 on the next page illustrates the integration of the key aspects of these theoretical traditions so that Ecological Identity can be simultaneously analyzed on both the individual role-based (IT) and the social category-based level of analysis (SIT). For the purposes of illustration assume the lines signify *lines of ecological identification.* The Individual role-based level of identification is thus marked by a single line labeled (Role). Identification along this line involves taking on a role within the broader group one sees him or herself to be a part of. In the case of EI, nature and the biophysical environment constitute the group. On this level we are focused on the types of behavioral and dispositional expectations (i.e. roles) that

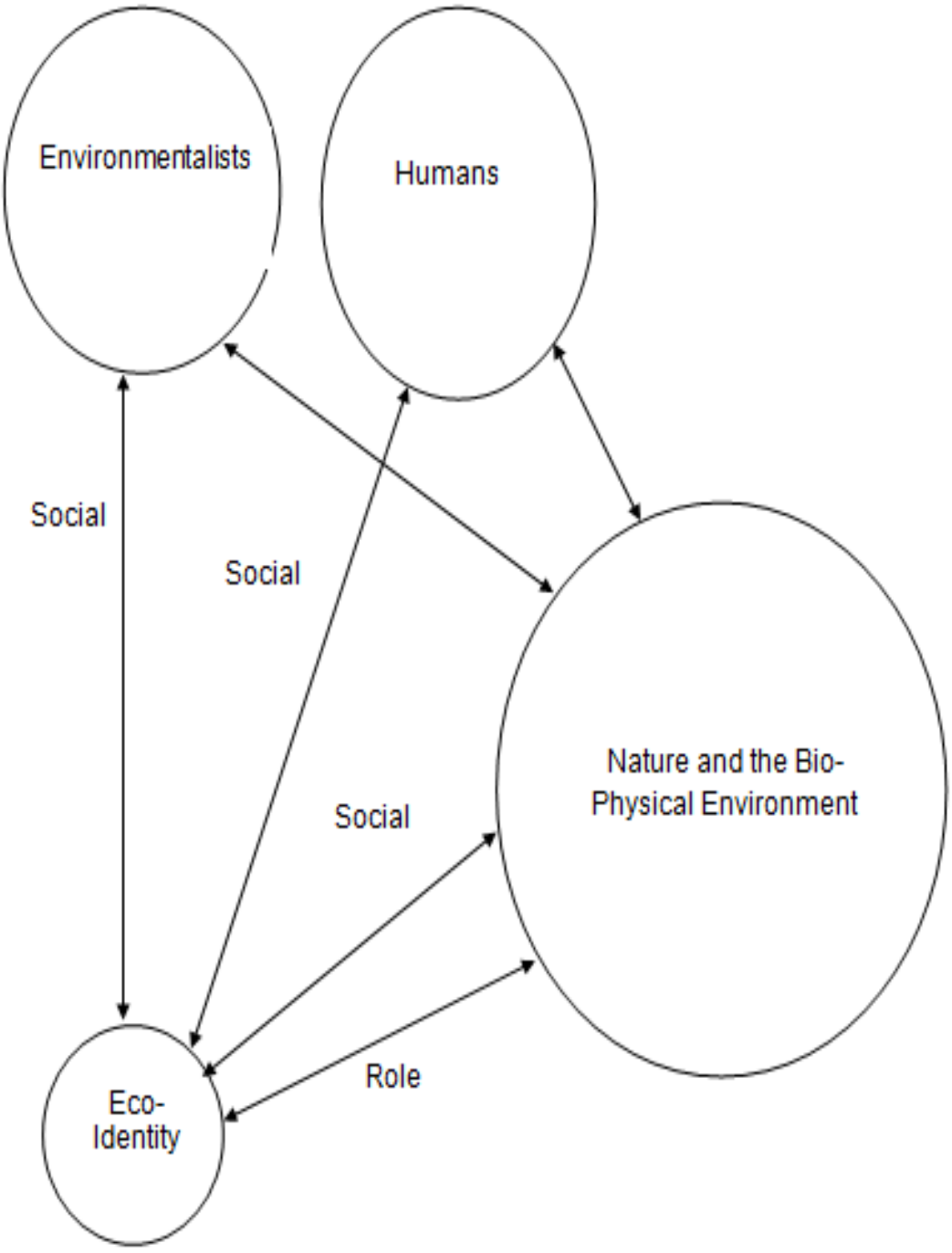

Figure 3.1 Identity Theory and Social Identity Theory

relate to being a part of an integrated social and biophysical system. For instance, taking on roles related to the minimization of consumption and waste production might be defining characteristics of EI on this level of identification. Consequently, EI is mediated through one's understandings of the relationships that exist between the self and nature/environment on this level.[43]

The social category-based level of identification is marked by the lines labeled (Social). Along these paths, identification involves first categorizing oneself into a particular social group or category, and thus assuming the perceived characteristics of that group. As the figure indicates, the three groups most relevant to ecological identity are assumed to be; '*environmentalists'*, *'humans', and 'nature/environment'*. Thus, the particular characteristics associated with each of these groups are vital to an understanding of EI on the social level of analysis.[44] On this level then we are focused on the following types of questions:

1) As an environmentalist, what are the characteristics you have that relate to your being a part of an integrated social and biophysical system?
2) As a human, what are the characteristics you have that relate to your being a part of an integrated social and biophysical system?

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[43] Importantly, there is an argument to be made that individual role-based identification also occurs between the individual and the roles he or she takes on as an environmentalist (and as humans for that matter). Specifically, it can in fact be the case that a role identity is in direct reference to a social group (see Stets & Burke, 2000). In the case of EI however, it would seem to be the case that the role-based meanings associated with being an environmentalist would be largely subsumed within the role-based meanings that define the self in relation to nature. Furthermore, "environmentalists", and "humans" are proper social groups. And so, for conceptual clarity and theoretical integrity the decision was made to consider the social category-based level of analysis in reference to these groups.

[44] It should be clear that the EI framework is assuming that on both the role and social level, the definition of the group or role is such that it connects the individual to nature and the biophysical environment as opposed to something different. This particular issue will be discussed in greater detail when discussing the dimensionality of Ecological Identity.

3) As a biological organism and creature of nature (animal) what are the characteristics you have that relate to your being a part of an integrated social and biophysical system?

For instance, a person who has internalized an EI on this social level would identify with environmentalists and their beliefs, have particular beliefs about human activities (e.g. technology and resource use), and feel close to other animals and aspects of nature. On this level of analysis it can be said that, Ecological Identity is mediated through one's understandings of the categorical structure of a given society (e.g. stereotypes, status groups, etc).

Finally, along all lines of identification (role-based and social-category based alike), the EI framework assumes that differentiation from salient oppositional others is a vital part of the identification process. Figure 3.2 (page 73) illustrates a way to integrate this differentiation dimension into the different levels of analysis discussed above. In the figure, salient oppositional others (i.e. out-groups) are indicated by boxes labeled Out Group. These boxes represent salient oppositional others and out-groups that the individual differentiates from, thus reinforcing his or her identification with nature and the biophysical environment. Importantly, the particular oppositional other parallels the particular level of identity to which it is associated.

Henceforth Out Group (1) in the diagram indicates an oppositional other on the individual role-based level. For instance, a person who has internalized an EI on this level might likely differentiate themselves from behavioral dispositions thought to be anti-environmental (e.g. over consumption or polluting behaviors). Alternatively, Out Groups (2), (3), (4) represent salient oppositional others and out-groups on the social level of analysis. In this way, EI is mediated through one's differentiation from others. For instance a person who has internalized an EI on this level might likely differentiate themselves from:

1) Groups that oppose environmentalists (e.g. the energy industry and its representatives)

2) Belief systems and people who are thought to have anti-environmental attributes (e.g. Conservatives, Corporations, etc.)
3) Belief systems and people who define humans as superior to nature and the environment such as Dominionists and Utilitarians (cf. Merchant, 1980, and Brulle, 2000).[45]

The Proposed Framework of Ecological Identity:

In order to be capable of operating across the complex conceptual levels specified by IT and SIT (as depicted in Figure 3.1), the framework of EI has been constructed in the following way. On the most basic level, the framework assumes that identities are rooted in the notion of positionality. Positionality is in turn assumed to form the basis of three core dimension of EI; sameness, differentiation, and centrality. Importantly, these dimensions are constructed in a very general way, so as to remain functional across the different conceptual levels of identity discussed above. The EI framework and its broader theoretical foundations are discussed in detail below.

The term positionality is fundamental to understanding EI, and it is meant to describe*, the positioning of the self in relation to objects through the attachment of meanings to them.* This dissertation argues that *positioning* is a quintessential feature of the social psychological construct of identity, and distinguishes it from constructs such as beliefs, norms and attitudes. Although typically not the focus of research, this positioning feature of identity is clearly reflected in the broader social psychology literature (Stryker, 1980 and 2008; Burke and Stets, 2009; McCall and Simmons, 1978; Tajfel, 1981; Turner 1985, Capek, 2006; Proshansky 1978, Stone, 1962; Hogg et al., 1995; Berger and Luckmann, 1966). For instance, Stryker (1980) asserts that, "identities are internalized positional designations", and Berger and Luckmann (1966) argue that identities, designate social locations (Stryker, 2008, 60; Berger and

[45] Clearly, there is significant overlap between these groups. The separation of them into these categories is purely for analytical purposes.

Luckmann, 1966; emphasis added). Lastly, reflecting both identification and dis-identification, Capek (2006) describes identity as, “the delicate balancing game

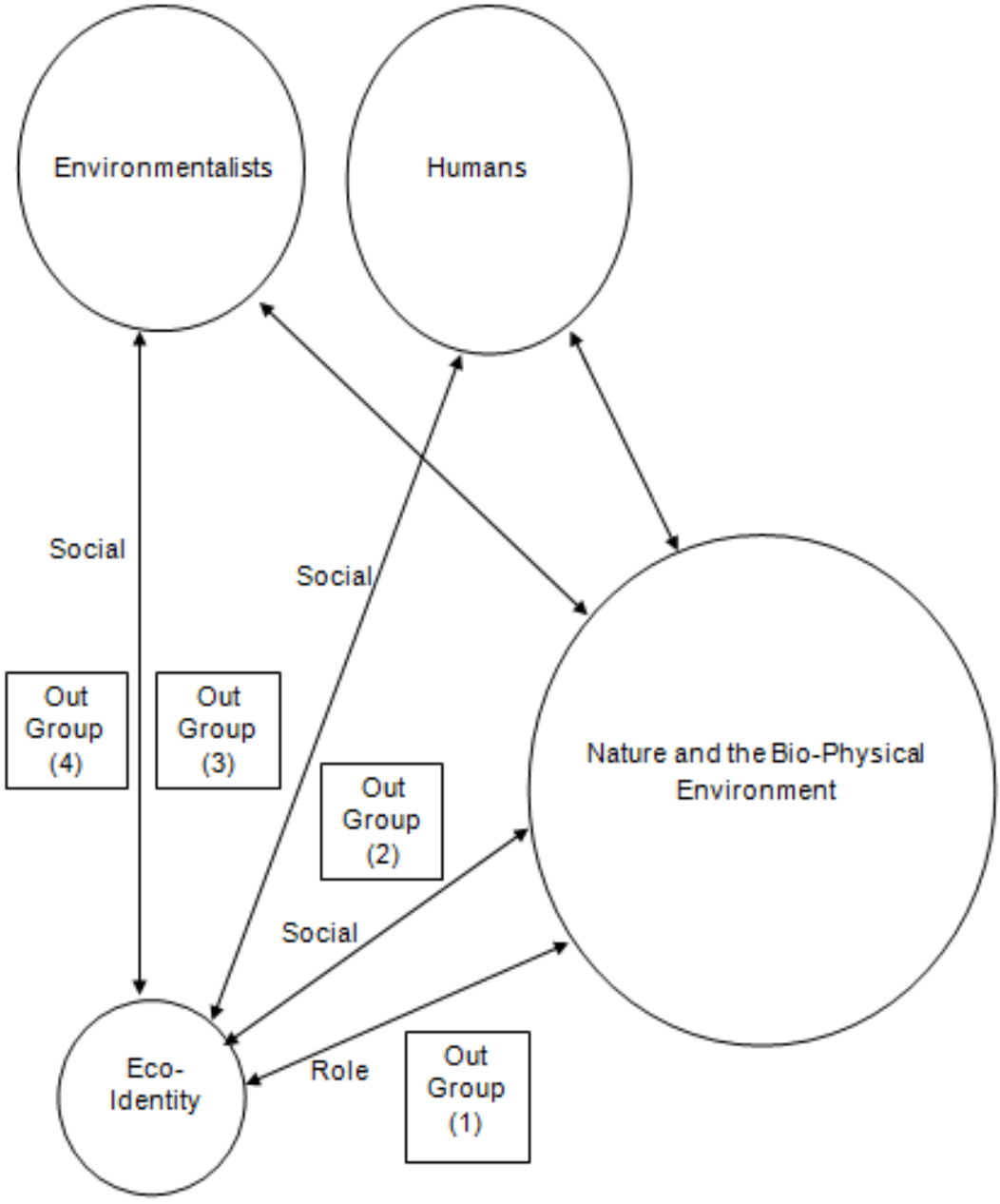

Figure 3.2 Identity Theory, Social Identity Theory, and Differentiation

whereby human beings…maintain separateness from and connectedness to surrounding structures and life forms" (pg. 158; emphasis added). Each of these conceptions illustrate how identity is viewed as a relational construct signifying the meaningful positioning of the self in relation to some other be it human or biophysical; this positioning is a core feature of the proposed model of EI.

The theoretical foundations of positionality can be found in classical pragmatism and the symbolic interactionist tradition. Drawing on this tradition, this dissertation grounds EI in a core phenomenological principle that assumes consciousness and perception are a relational experience, whereby people are embedded in inter-subjective contexts of meaning (Mead, 1934; Blumer, 1969; Schutz,1967; Husserl, 2001; Merleau-Ponty, 1996). This inter-subjective consciousness is produced and experienced through symbolic social interaction and the projection of meaning onto the self in relation to a world of objects. Within this perspective, meanings are emergent properties and, "understood to be one's meditational responses to stimuli" (Burke, 2006, 82). Importantly, objects become meaningful through their relation to the self, and are henceforth defined as such. That is, "Objects are plans of action", the meaning of an object, "arises from how the person is initially prepared to act toward it" (Mead, 1934, 276; Blumer, 1969, 68-69). In short, reflexive self-consciousness emerges from a social process whereby the individual ascribes meaning to objects based on the objects relevance to self. From this perspective, meanings are situated between observer and observed, and are both produced by, and generative of the perceived relationship between the two.

As they are experienced by the individual however, meanings are the attributes of objects, (be it the self as an object or an external object such as a tree). One explanation of how objects are imbued with meaning is the process of objectivation (Berger and Pullberg, 1965; Berger and Luckmann, 1966). Objectivation is a process whereby meaning is projected onto the world and the self in relation to the world, and then, "man establishes distance from his producing and its product, such that he can take cognizance of it and make of it

an object of his consciousness" (Berger and Pullberg, 1965, 60). Through objectivation, meanings become attributed to objects, and in this way, "man is capable of producing a world that he then experiences as something other than a human product" (Berger and Luckmann, 1966, 56). Consequently, objects become known and experienced as external facts.

Similar processes of objectivation are involved in the attachment of meaning to the self. Indeed, the classical symbolic interactionist writings of Mead conceive of the self as coming into being through the individual's ability to view him or herself as a social object in relations with othersii (Mead, 1934). In other words, "the self which consciously stands over against other selves thus becomes an object, an other to himself" (Mead, 1913, 377). Furthermore, given that meanings are understood to arise from an initial preparedness to act toward objects, it follows that meanings attached to the self and objects are indicative of the relationship presumed to exist between the two. Identity, as a positional designation of self in relation to others, thus links the self to other through these meaningful relationships. Consequently, the proposed framework of ecological identity posits that identity provides the link that connects self to others through positioning the self over and against others, in webs of meaningful relationships presumed to exist between the two.[46]

As mentioned above, positioning of the self in relation to social objects is formed on the basis of three core dimensions of EI; sameness (strong identification with other), differentiation (strong dis-identification with a salient oppositional other or out-group), and centrality (the relative importance or salience of EI in relation to other identities). Clearly these dimensions have their parallels in both IT and SIT, and represent some of the key features of both of them. Below, each dimension and its connection to IT and SIT are discussed in detail.

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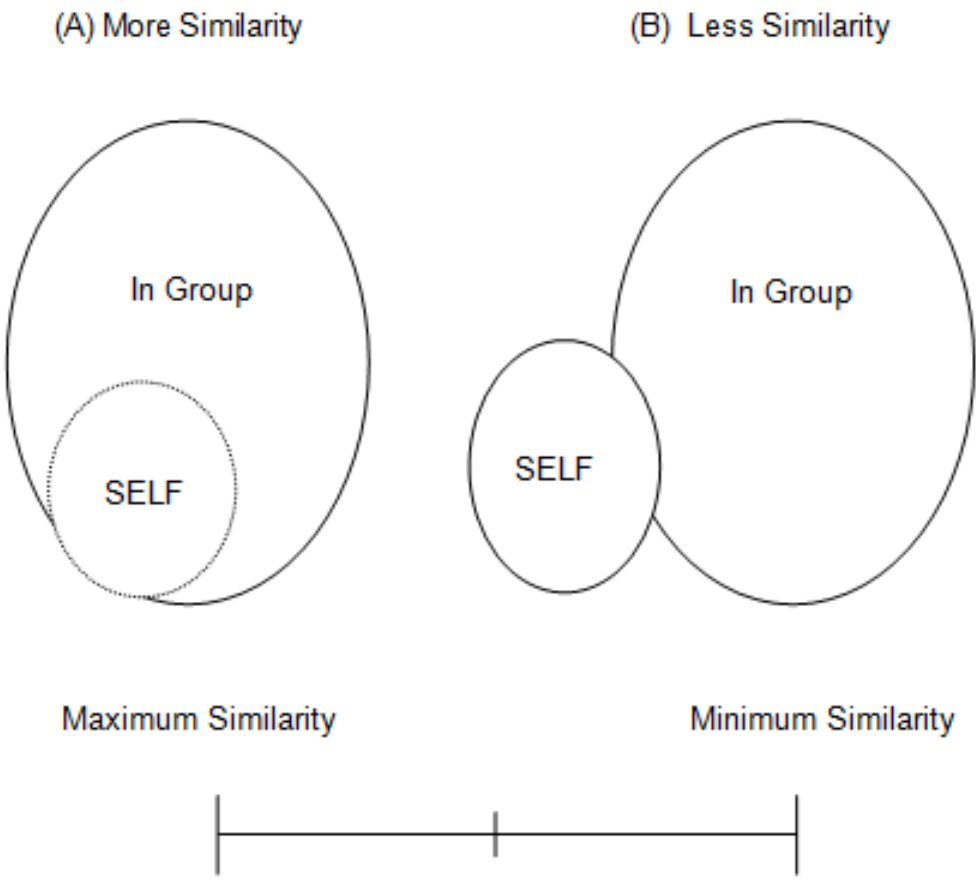
[46] It is important to understand that the word connects here is used innocuously and not meant to communicate anything about affinity, likeness, or similarity. It just means that self is linked to other through the meaningful relationships that are understood to exist between the two. These relationships

Sameness

The sameness dimension of ecological identity is conceptualized as the extent and ways by which an individual defines him or herself as part of an integrated social and biophysical (i.e. ecological) system through a recognition of sameness with in-group others. It involves the identification of the self with like others, as in the case of group membership or the internalization of a role position. As can be seen in Figure 3.3 (following page), the sameness dimension refers to an individual's identification with a like other or in-group, such that the self and other are understood as sharing the same characteristics and/or belonging to the same social group or category. Importantly, the sameness dimension is assumed to exist on a continuum of greater and lesser similarity. Whereas image (A) illustrates the maximum amount of similarity (i.e. sameness) attributed to self and other, image (B) represents a minimum amount of similarity. Where an individual falls on this continuum will be taken as an indication of the degree to which the individual has internalized an ecological identity.

Recall from above that each of the three dimensions (sameness, differentiation, and centrality) is assumed to operate across the two conceptual levels specific to IT and SIT. For instance, on the individual role-based level, the sameness dimension entails differing degrees to which individuals have internalized behavioral and dispositional role expectations that acknowledge the interrelationship between the self and nature and the biophysical environment. On the social category-based level of identity however, the sameness dimension entails the extent to which individuals have internalized pro-environmental attributes perceived to be characteristics of environmentalists, humans, and nature. For instance, image (A) represents the phenomenon of depersonalization, the situation where self-perception and behavior of the individual correspond with the prototypical or normative understanding of the in-group other (the dashed line represents the dissolution of the unique individual into the group).



Figures 3.3 Sameness

Differentiation

The differentiation dimension of ecological identity is conceptualized as *the extent and ways by which an individual defines him or herself as part of an integrated social and biophysical (i.e. ecological) system through differentiation from salient oppositional others/out-groups.* It involves the process of setting the self apart from meanings and group affiliations that are considered not descriptive or opposite of the self. The self is thus positioned in a relationship of contradistinction and opposition to other. Importantly the degree of differentiation is conceived of as existing on a continuum higher and lower differentiation (Figure3.4). Whereas image (A) illustrates the maximum amount of

differentiation from other, and image (B) represents a minimum amount of differentiation. Where and individual falls on the continuum will be taken as an indication of the degree to which the individual has internalized an ecological identity.

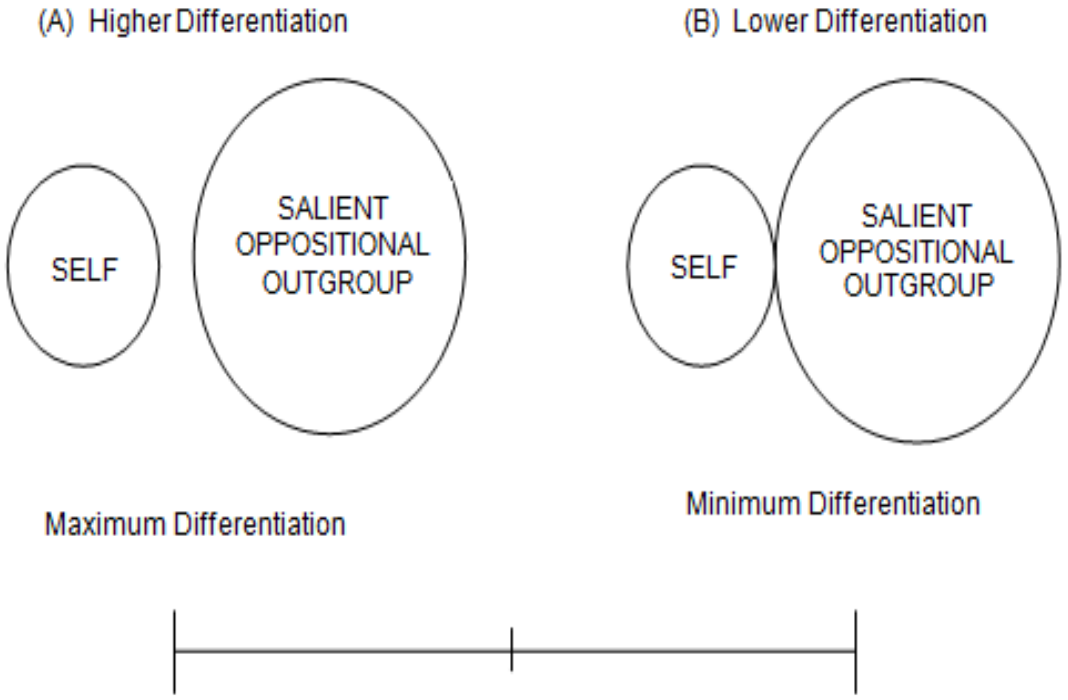
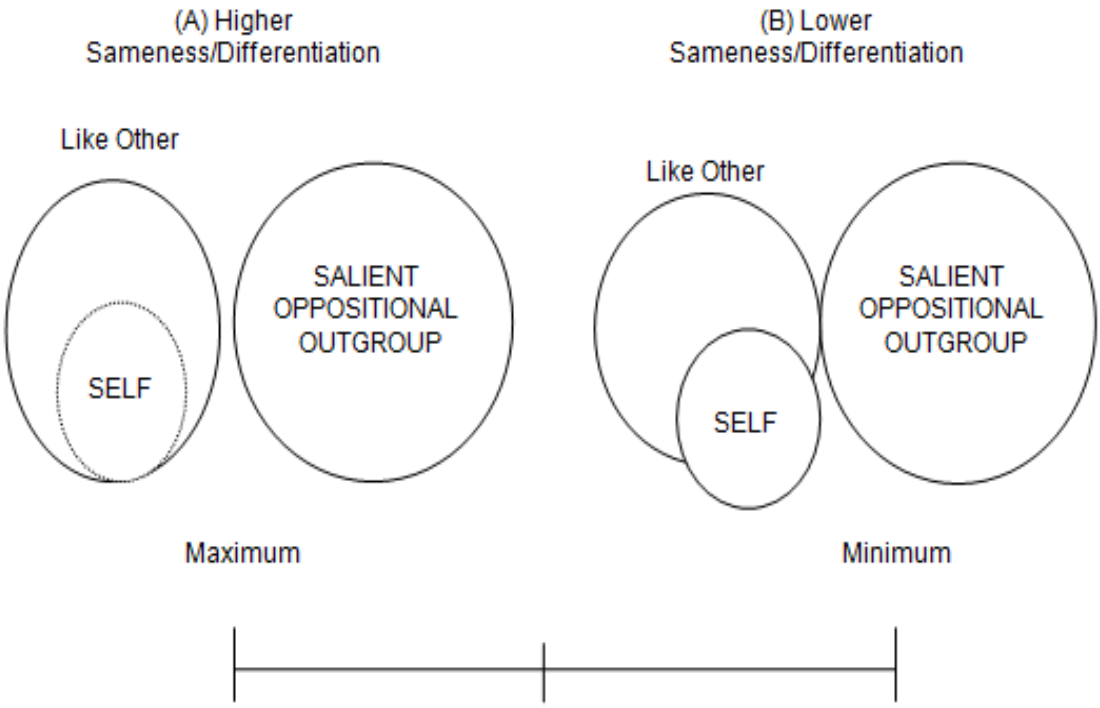


Figure 3.4 Differentiation

It is important to recall from above that the differentiation dimension involves the exercise of power and the projection of meaning onto 'others'. To illustrate consider Figures 3.5. In these figures we see the integration of both the sameness and the differentiation dimensions. Self in image (A) is characterized by a higher level of sameness with like other, than is self in image (B). Importantly though, the diagram suggests that the increased level of sameness in image (A) is in part a function of greater levels differentiation. And conversely, the lower level of sameness in image (B) is a function of lower levels of differentiation. On the individual role-based level of EI, differentiation entails

differing degrees to which accepted behavioral and dispositional roles are reinforced through the identification and stigmatization of roles viewed as anti-environmental and irresponsible. On the social category-level of EI, differentiation entails differing degrees to which the internalization of in-group attributes results from projecting negative evaluations onto oppositional others such as political or industry groups. This dimension is reflective of the IT concept of dis-identification and the SIT concept of self-enhancement through meta-contrast.



Figures 3.5 Sameness & Differentiation

Centrality

In addition to individuals positioning themselves in relation to others through sameness and differentiation, the EI framework assumes that individuals have multiple identities and position them in terms of their relative importance or psychological centrality. And so, in addition to the sameness and differentiation

dimensions, our frame work of ecological identity includes a third dimension, centrality. Many social psychologists argue that people internalize multiple identities, and these are organized hierarchically based on their relative importance within the overall self-concept (Stryker,1980; Rosenberg, 1979; McCall and Simmons, 1978; Burke,1991; Callero,1985). Drawing upon this line of research, *the centrality dimension of EI refers to the overall rank it has in relation to the myriad other identities existing within one's overall self-concept.* Past theorizing and research into the centrality of identities has included multiple conceptions, and often inconsistent and overlapping use of terminology. Indeed, "the same label sometimes is attached to different underlying conceptions…thus creating confusion" (Stryker and Serpe, 1994, 19). A review of the research however indicates that two distinct conceptions of centrality have received the most attention and empirical support; identity *salience and prominence*.

Stryker's (1980, 1994) conception of identity salience and McCall and Simmons (1978) conception of identity prominence were both used to design the centrality dimension within our framework of EI. The salience of a given identity is "defined as a readiness to act out an identity as a consequence of the identities properties as a cognitive structure or schema" (Stryker and Serpe, 1994, 17). That is, an identity with a high degree of salience is an identity that provides a readily accessible cognitive basis for arriving at definitions of situations in which people find themselves. The outcome of a highly salient identity is an increased likelihood of defining situations in ways that invoke the identity, and call the self to action. Identity salience is assumed to be a function of two types of commitment; interactional and affective. Interactional commitment reflects the number and scope of relationships in a person's life that involve a given identity, while affective commitment reflects the level of positive (or negative) evaluations a person holds regarding these relationships. In short, an identity high in salience then is one that involves a large number of highly valued relationships.

Whereas identity salience draws attention to the extent that a person is embedded in meaningful relationships that invoke a given identity, identity prominence draws attention to, “the relative value it has for his or her overall conception of one’s ideal self” (Owens et al., 2010, 481). This facet of centrality is thus concerned with the ranked importance a person ascribes to one identity in relation to others within the self concept, and, “how much their self-esteem is bound to its successful activation” (Owens et al., 2010, 481). Taken together then, an individual who has internalized an ecological identity that is central to his or her overall self-concept (i.e. it is highly salient and prominent) is someone who has a number of highly valued relationships that invoke the identity and sees themselves more through this identity than any other.

With this then, the proposed model of EI is complete. As can be seen in Figure 3.6 on the following page, the final framework of ecological identity is comprised of three dimensions, labeled sameness, centrality, and differentiation. These dimensions describe how the self is positioned, (to a greater or lesser degree), as *the same as some* and *differentiated from others* both in terms of one’s individual role-based identity, and in terms of one’s social category-based identity. Finally, if an ecological identity has been internalized, it becomes part of a larger set of identities which are organized in terms of their psychological centrality or importance to the overall self-concept.

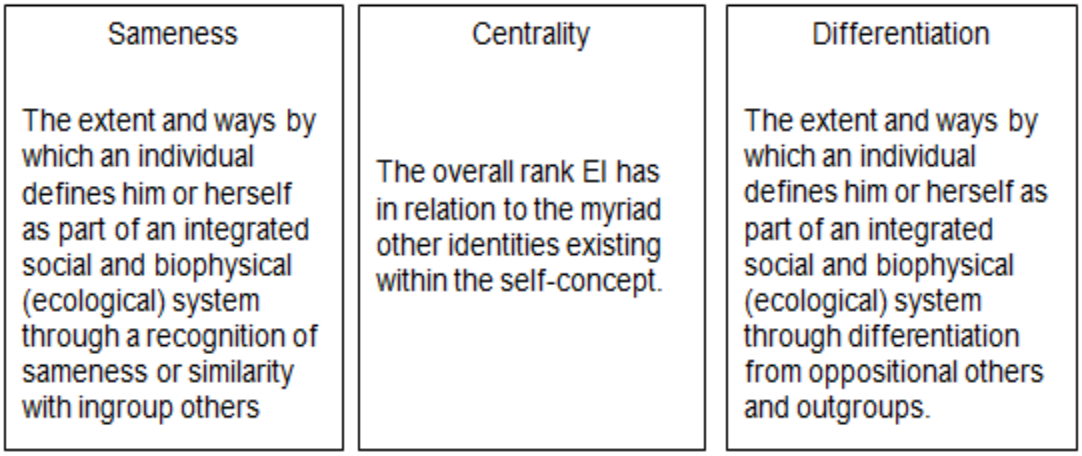


Figure 3.6 Dimensions of Ecological Identity

Expectations and Hypotheses

Ecological Identity is conceptualized as *the extent and ways by which an individual views him or herself as part of an integrated social and biophysical (i.e. ecological) system characterized by interconnected processes and relationships.* The framework assumes that aspects of identification (and dis-identification) occur along three dimensions, sameness, differentiation, and centrality; and across both the individual role-based level and the social category-based level. Given these theoretical propositions and foundations there are some clear expectations and hypotheses that if confirmed would demonstrate the validity and reliability of the EI construct, and its operationalization in scale form (EIS). These expectations and hypotheses are discussed first in relation to the focus groups (Stage I), and then in relation to the survey (Stage II). Finally, an exploratory model of ecological behavior will be presented that integrates the EIS with some of the more established theoretical constructs to test specific hypotheses associated with this type of behavior.

Stage I: Focus Groups

As well as providing the basis for the survey items that comprise the EIS, the focus group stage of this dissertation provided initial evidence to validate the construct of Ecological Identity. Going into the focus groups, there were four key expectations that if confirmed would offer initial support to the validity of the EI construct. The first involved the assumption that EI can and should be able to be affectively analyzed on both conceptual levels of identity (i.e. the individual role-based and the social categorical-based). The second expectation related to the differentiation dimension of EI. The third expectation related to the centrality dimension and expected differences between the focus group sessions held with environmental organization members and the one held with UT students. Finally, a difference was expected in the number and types of pro and anti-environmental behaviors reported by environmental organization members compared to UT students. Each of these expectations is discussed below.

Given the importance of language in constructing, performing, and negotiating identities it seemed likely that two distinct things should emerge in the focus group discussions (in particular the focus group sessions with environmental organization members). First, as detailed in Weigert (1986), the different levels of identity should be witnessed in the self-referent language used by focus group participants during discussions. Consider for instance the different connotations of the terms, 'I', 'Me', and 'We'. Weigert (1986) argues that each of these is a signifier of different *modes of identity.* Whereas 'I' and 'me' signify the irreducible subjective and objective modes of individual level identification, 'we' signifies inter-subjective group identity. Each of these, "modes of identity constitute a person" (Weigert, 1986, 166). Similarly, when focus group participants shift their language from 'I', to 'We', it will be assumed to signify a shift in the level of identity analysis; from the individual role-based level to the social category-level. Again, individual role-based identification involves the internalization of behavioral dispositions and role expectations, whereas social category-based identification is rooted in uniformity and similarity of beliefs and

other group attributes. Consequently, statements such as, “I try to minimize my impact on the environment”, will be assume to relate to individual role-based identification[47]. Alternatively, statements such as, “We are all a part of nature”, will be assumed to relate to the social category-based identification[48]. Evidence of these linguistic cues and shifts in identity levels would provide support to the validity of the EI framework by confirming the assumption that EI can be analyzed on both.

The second expectation for the focus groups related to the differentiation dimension of EI. As discussed above, this dimension of identification has yet to be investigated by contemporary environmental identity theorists, but we expected the focus group discussions would contain some mention of salient oppositional others and out-groups. Moreover, given that this dimension (like the sameness dimension) is assumed to operate on both levels of identification comments should reflect the linguistic shifts mentioned above. For instance, statements such as, “people who don’t think about where their food comes from bother me”, were assumed to relate to the differentiation dimension on the role-based level.[49] In this way, differentiation will be evident when focus group participants identify and stigmatize particular roles as anti-environmental and irresponsible, and through the projection of negative attributes and evaluations onto oppositional others such as political or industry groups.

A third expectation to note in regard to the focus group sessions relates to the centrality dimension of EI and differences that should be found between the sessions held with environmental organization members, and the one held with UT students. An underlying assumption of the research design being used in this dissertation is that members of environmental organizations are more likely to have internalized an ecological identity. Consequently, we expect the characteristics of EI to be present in the session held with environmental

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[47] Role based sameness in particular.
[48] Social based sameness in particular.
[49] This reflects differentiation on the role-based level because it illustrates an individual identifying a behavioral disposition that is oppositional to how the speaker sees themselves.

organization members to a greater degree than in the one held with UT students.[50] That is, the issues raised in the focus group discussions should be noticeably more relevant to the participants in the environmental sessions than the participants in the non-member session. This should be reflected by an increased amount of conversation covering a wider scope and diversity of topics related to the environment.

Finally, upon completion of the sessions, participants were asked to complete an exit questionnaire. The questionnaire included open and closed-ended questions and was designed to obtain information regarding the centrality of EI to participants, their beliefs about pro and anti-environmental behaviors, and their beliefs about environmental problems. Again, there should be noticeable differences in the responses to the exit questionnaire between those who are members of environmental organizations, and those who are not. In regard to centrality, we expected that members of environmental organizations would report having more relationships that involve nature and the environment. Furthermore, these relationships should be more valued and important to members of environmental organizations. Participants in the environmental sessions were also expected to report spending more time in nature than participants from the non-member session. It was also expected that a wider range and more specific set of pro and anti-environmental behaviors would be reported by participants in the environmental sessions. Similarly, it was expected that members of environmental organizations would report a wider range and more specific set of environmental problems.

Stage II Questionnaire

The survey stage of this dissertation was used to validate the EIS and consequently the EI construct. Given the theoretical underpinnings of the framework of EI several hypotheses were tested. These hypotheses are

[50] Given that environmentalism has in many ways become socially normative, EI will likely be present in the randomly sampled group at lower levels.

presented below in relation to the particular dimension of EI and it relates to most.[51] Before discussing the hypotheses though, it is important to understand that the EI framework assumes that identification with nature and the biophysical environment can occur to greater and lesser degrees. That is, some people may greatly identify with nature and the bio-physical environment and could be described as having a strong ecological identity. Alternatively, some people may only minimally identify with nature and the biophysical environment and could be described as having a weak ecological identity. Consequently, those who rank highly on the EIS scale will be described as having a strong ecological identity and greatly identifying with nature and the biophysical environment; while those who rank low on the EIS scale will be described as having a weak ecological identity and minimally identifying with nature and the biophysical environment.

Sameness: The theoretical framework discussed in this chapter assumes that the internalization of a strong ecological identity involves categorizing oneself into social groups whose characteristics are environmentally friendly. Furthermore, the internalization of a strong ecological identity involves taking on pro-environmental roles.

Hypothesis 1: People who have internalized a stronger ecological identity will engage in more pro-ecological behaviors than people who have not.

Identification with nature and the bio-physical environment (EI) involves the internalization of pro-environmental roles. Pro-environmental roles are behavioral expectations and dispositions that acknowledge the interdependence of social and biophysical systems. Behaviors such as recycling, purchasing ecologically friendly products, and minimizing energy use are thought by many to be good for the environment, and thus are directly reflective of pro-environmental roles. Consequently, the greater someone identifies with nature and the bio-

[51] Importantly, several of these hypotheses relate to multiple dimensions of EI. Their categorization here should not be interpreted in terms of exclusivity.

physical environment, the greater number of pro-environmental behaviors he or she will engage in. Operationally then, the higher one scores on the EIS scale, the higher her or she should score on an index of pro-environmental behavior.

Hypothesis 2: The greater someone values putting the needs of others and the collective above his or her own wants and desires, the more likely he or she is to internalize a strong ecological identity.

Values can be defined as 'desirable end states' (cf. Rokeach, 1973), and putting the needs of others above one's own have been referred to as universalist and self-transcendent values (Schwartz, 1992). These types of values likely translate into behaviors and dispositions that are pro-environmental. Indeed, if someone sees themselves as *part of an integrated social and biophysical system characterized by interconnected processes and relationships*, it would be reasonable to assume that they would have a disposition to put the needs of others and the collective (human and non-human) above their own wants and desires. Operationally then, the higher one scores on a scale of self-transcendent values, the higher he or she should score on the EIS scale.

Hypothesis 3: The stronger ecological identity someone has internalized, the more concerned he or she will be about environmental problems.

Internalization of an ecological identity involves categorizing oneself into a social group whose characteristics are environmentally friendly, and then taking those characteristics on as one's own. In this regard, a person who has internalized a strong EI should identify with environmentalists and their beliefs. On a basic level, environmentalists are concerned about the environment and environmental problems. Thus, people who have internalized a strong EI should be more likely to share this characteristic with environmentalists than those who have internalized a weaker EI. Operationally then, the higher one scores on the EIS scale, the higher one should score on an index of environmental concern.

Hypothesis 4: The stronger someone endorses an ecological worldview, the stronger ecological identity he or she will internalize.

An ecological worldview can be thought of as a set of, primitive beliefs about nature, the Earth, and humanity that connect people with the environment. Adopting such a worldview has been referred to as endorsing a New Ecological Paradigm (Dunlap et al., 2000). The New Ecological Paradigm (NEP), as a construct, suggests that some people have taken on a set of pro-environmental *primitive* beliefs (cf. Dunlap et. al. 2000) about the relationship between humans and nature. Among other things these beliefs relate to technology, resources, environmental problems, and the rights of nature. These primitive beliefs translate into the attribution of particular characteristics to humans as a group; and internalization of a strong ecological identity involves categorizing oneself into a social group whose characteristics are environmentally friendly. Consequently, people who strongly endorse an ecological worldview should be more likely to identify with nature and the biophysical environment. Operationally then, the higher one scores on the NEP scale, the higher he or she should score on the EIS scale.

Differentiation: The theoretical framework proposed in this chapter assumes the internalization of an ecological identity involves the differentiation from behavioral dispositions and particular groups and belief systems thought to be anti-environmental (e.g. over consumption and excess, polluting behaviors).

Hypothesis 5: The greater someone values enhancing themselves in relation to others, the less likely he or she is to internalize a strong ecological identity.

As mentioned in hypothesis five (5), values can be defined as 'desirable end states' (cf. Rokeach, 1973), and enhancing one's self in relation to others has been referred to as self-enhancement and power values (Schwartz, 1992). Values related to power as conceptualized by Schwartz include things such as gaining recognition from others, having control and leadership over others, and

the attainment of material possessions. Internalization of a strong ecological identity involves differentiation of one's self from behaviors and dispositions thought to be anti-environmental, and these types of values likely translate into behaviors and dispositions that are anti-environmental. Operationally then, the higher one scores on a scale of power values, the lower he or she should score on the EIS scale.

Centrality

The theoretical framework discussed in this chapter assumes that a person who has internalized an EI will prioritize their relationships with nature and people who share their interest in nature and environmental issues above other aspects in their life.

Hypothesis 6: Members of student-environmental organizations will have internalized stronger ecological identities than non-members.

Participation in a student-environmental organization involves establishing relationships with a number of people who are concerned about the environment and together efforts are focused environmental issues. It follows then that individuals who are members of student environmental organizations will likely have more interactions with others that involve the environment and environmental issues than individuals whom are not members. Internalization of a strong ecological identity involves an individual having a large number of highly valued relationships that are in some way related to nature and the biophysical environment. Consequently, people who are members of environmental organizations should have internalized a stronger ecological identity. Operationally then, if someone reports being a member of a student-environmental organization, he or she should score higher on the EIS scale.

Hypothesis 7: People who have internalized a strong ecological identity should positively evaluate environmentalists and other people who make efforts to preserve and protect the environment.

Social psychologists often refer to an individual's evaluation of some specific object, concept, or behavior as favorable or unfavorable, good or bad, positive or negative as an attitude. Furthermore, internalization of a strong ecological identity means that an individual places a high level of importance on his or her identity in relation to nature and the biophysical environment. Consequently, a person who has internalized a strong ecological identity should have a positive attitude toward environmentalists and other people who make efforts to preserve and protect the environment. Operationally then, the higher someone scores on the EIS scale, the higher he or she should score on an index of pro-environmental attitudes.

Hypothesis 8: People who have internalized a strong ecological identity should be more likely to think others expect them to make efforts to preserve and protect the environment.

Social psychologists often refer to expectations that others have regarding our behavior as norms. Furthermore, internalization of a strong ecological identity means that an individual has a number of highly valued relationships that invoke the identity and he or she sees themselves through this identity more than any other. Consequently, a person who has internalized a strong ecological identity should be more likely than someone who has not to feel pro-environmental normative pressures from others. Operationally then, the higher someone scores on the EIS scale, the higher he or she should score on an index of pro-environmental norms.

Exploratory Model of Ecological Behavior

Figure 3.7 (next page) illustrates a model of ecological behavior that is also explored in this dissertation. The survey included indicators of each of the constructs listed in this diagram. The model suggests that engagement in a range of general ecological behaviors (e.g. minimizing energy use, purchasing environmentally friendly products, etc.) is driven by a complex set of social psychological constructs.[52] As the diagram depicts, these social psychological constructs range in terms of their *proximity* to behavior. The closer in proximity a construct is to a behavior (e.g. Environmental Concern), the stronger and more direct its influence will be. The more *distal* a construct is to a behavior (e.g. Values), the more indirect its influence will be. The arrows in the diagram indicate assume directions of causality. Thus, Values and Worldviews are assumed to influence the likelihood that someone internalizes an ecological identity. In turn, if someone internalizes an ecological identity, it will influence their level of concern about the environment, their attitudes toward the environment and environmentalists, and the norms they feel obliged to follow. These more proximal effects then are assumed to directly influence the likelihood someone engages in a range of ecological behaviors. Ecological identity is assumed to lie directly between more distal and abstract constructs (i.e., Values and Worldviews) and more proximal and concrete constructs (i.e., Environmental Concern, Attitudes, and Norms). The model will be tested via a linear mixed-effects regression.

[52] It is acknowledged that there are other determinants of behavior as well, but these are beyond the scope of this dissertation.

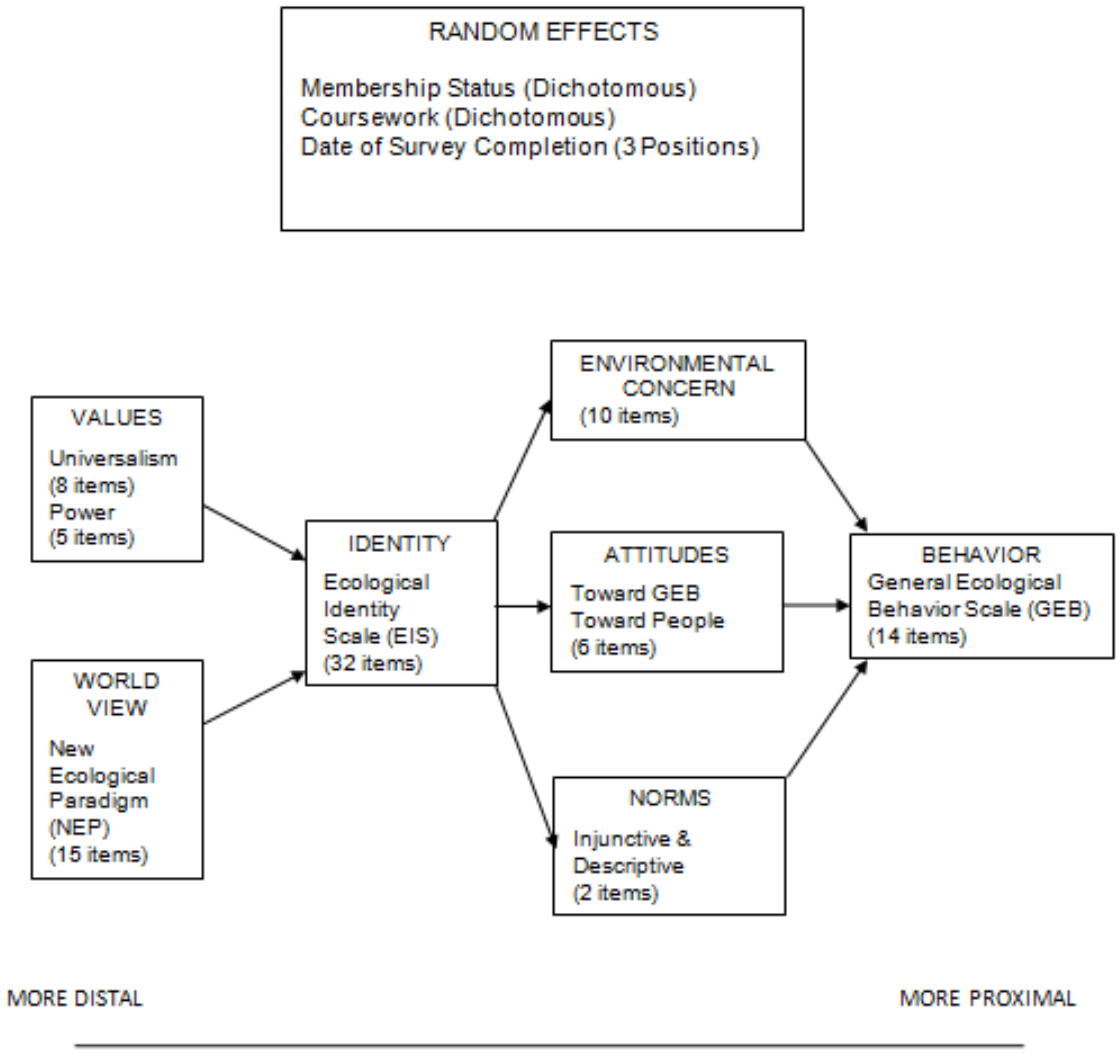

Figure 3.7 Exploratory Integral Model of Ecological Behavior

CHAPTER IV RESEARCH DESIGN AND RESULTS

Overview

The primary goal of this dissertation is to develop and assess a multi-item scale of ecological identity (EI) that improves on past measures. To do this, a mixed-methods, *known-groups* approach to scale construction employing both focus groups and a survey was used. In the first stage (1) of this design, four focus groups were conducted to obtain valuable information for the construction of both the Ecological Identity Scale (EIS) and a pro-ecological behavioral index that was used in testing the EIS scale. The second stage (2) involved administering a web-based survey to a sample of undergraduate students at the University of Tennessee in order to test the reliability and validity of the scale. Finally, Stage (3) used the survey results to test an exploratory model of ecological behavior that integrates EI with other more established theoretical constructs. The design and results of each of these stages are discussed below.

In accordance with this three stage research design, this chapter is organized into three sections. Section 1 discusses the focus group stage of the research. It includes a rationale for using mixed-methods to design the EIS scale, an overview of focus group research in general, and details regarding the specific focus group design used here. Results from the focus groups sessions and a list of the 23 EIS items derived from them conclude this first section. Sections 2 and 3 cover the survey stage of the research. Section 2 begins with an overview of web-based surveys and the information-theoretic approach to statistical analysis that was used. Next it covers the design and results of a web-based pre-test questionnaire that was used in order to conduct a statistical power analysis prior to distributing the full survey. Section 2 concludes with a discussion of the design of the full student survey and results from several formal validity and reliability tests. In a final test of the validity of the EIS scale, **Section 3** covers the results of an exploratory path model of ecological behavior that

integrates Ecological Identity with other constructs such as Worldviews, Values, Attitudes, Norms, and Environmental Concern.

Stage (1): Focus Group Methods and Results

Rationale for Mixed Methods Approach

As discussed in Chapter 3, this dissertation is theoretically grounded in a pragmatic symbolic interactionist perspective. It assumes that ecological identity exists as an emergent property of socio-historical and bio-physical interactions. EI is assumed to be comprised of regularities of thought and action that are, "not ontological but epistemological realities" (Brubaker et al., 2004, 45). This way of conceptualizing ecological identity is important because it avoids the tendency to reify nature and social psychological constructs as things 'out there'. Instead, this dissertation conceives of ecological identity and material nature as interrelated and conjointly constituted (cf Freudenberg et al., 1995). Such a perspective drops the nature-society dualism in favor of a focus on tangible products of thought and action (Beck, 1999). And so, the construct of ecological identity developed in this dissertation can be thought of as an *ideal-type;* an analytical construct that has been built up and validated through empirical observation eventually taking form as a precise tool that can be used to conduct systematic inquiry (Kalberg, 2005).

Given these theoretical foundations, it seems logical that a valid means of creating a survey measure of such a construct is begin by consulting individuals and groups who have likely internalized an ecological identity. Consequently, a mixed-methods research design seems appropriate. Indeed, Creswall and Piano-Clark (2006:5) describe mixed methods research as a methodology that, "involves philosophical assumptions"…and…" focuses on collecting, analyzing and mixing both quantitative and qualitative data in a single study or series of studies". The mixed-methods design employed in this dissertation began by gathering qualitative information from members of environmental organizations

and UT students via focus groups.[53] The results from these focus group sessions were then analyzed and refined into a useable survey instrument, the EIS scale. Importantly, this mixed-methods approach aligns the research design and methodology with the theoretical assumptions being put forth in the EI framework. The following section discusses in greater detail, the rationale for using focus groups as the qualitative stage of the investigation.

Rationale for Focus Groups

It was argued in the literature review that existing social psychological measures such as *environmental identity* (Clayton, 2003) and *environment identity* (Stets and Biga, 2003) do not cover the full domain of content related to identification with nature and the biophysical environment. In more formal terms, the content validity of these measures has not been established. By consulting individuals and groups who have likely internalized an ecological identity (i.e. environmental organization members) in order to develop the items that comprise the EIS scale, this dissertation improves upon these past measures.

In Stage (1) a series of four (4) focus group meetings with 6-10 people each, were conducted. Three of the sessions were comprised of members of environmental organizations and 1 session was comprised of a random sample of UT students.[54] This design can be thought of as a *known-groups* approach to scale construction because members of environmental organizations have been shown to hold known sets of attitudes, beliefs, and worldviews that are directly related to identification with nature and the biophysical environment (Kitchell et al., 2000). Hence, focused discussion with members of these organizations

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[53] A total of 4 sessions of 6-10people were conducted. 3 sessions were comprised of members of environmental organizations and 1 session was comprised of a random sample of UT students. This will be discussed in greater detail below.

[54] The session being held with a random sample of UT undergraduates will provide a baseline comparison/control group against which to compare qualitative data gathered between the two types of groups. It will also be used to ensure correspondence between the language and conceptual orientation of the final survey and that of the target population (UT undergraduates). This is discussed in greater detail below.

provided valuable insight into the content and character of their views about *self* in relation to the nature and the bio-physical environment. This information was in turn used as the basis of the items that comprise the EIS scale. Figure 4.1 on the following page illustrates this design.

As the diagram indicates, the framework of EI was initially derived from a careful review of the theoretical and empirical literature on identity and other related constructs (e.g. self, connectedness to nature, inclusion of nature in self, etc.). Next, a set of focus group objectives was designed in order to tap into information directly related to EI and its dimensionality on both levels of analysis (see Ch. 3).[55] Third, specific discussion questions for the focus groups were formulated for each objective. The questions were designed to illicit focused discussion of the information needed to achieve each individual objective. Lastly, the feedback obtained from the participants in the focus groups was used to both design the items in the EIS scale, and to provide initial support for the validity of the EI construct.

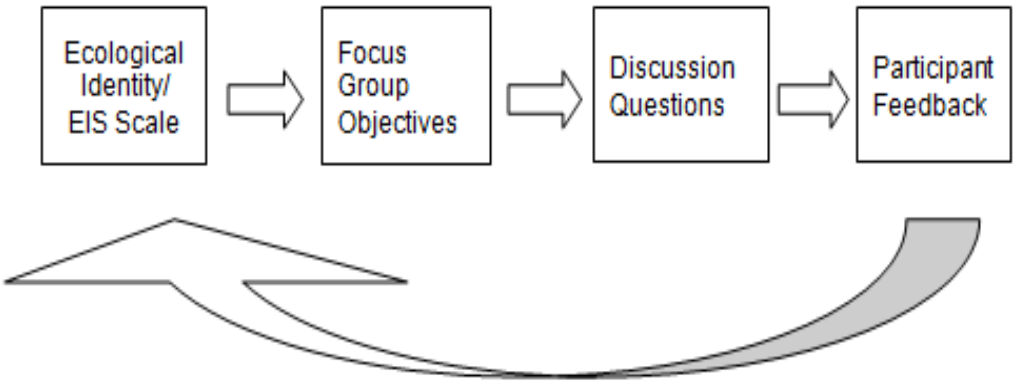

Figure 4.1 Known-Groups Design

[55] Recall from Chapter three that the EI framework assumes identification with nature and the biophysical environment occurs along three dimensions that operate on two levels of analysis (i.e. the individual role-based, and the social category-based).

Focus Groups: Overview

Although using known-groups for validation has a history in psychometric testing, it is perhaps most frequently used to refer to statistical tests of validity.[56] In this situation, a statistical test is used to demonstrate that an instrument can discriminate between groups known to possess the quality measured by the instrument and groups that do not (Hattie and Cooksey, 1984). The research design employed in this dissertation goes beyond this by not only using known-groups in statistical testing (Stage 2), but also *in the actual construction of the scale items*.

Focus groups are well suited for this known-groups approach to scale development. In fact, they are a commonly used technique for creating closed-ended surveys that attempt to measure complex constructs. A typical design for such research is to convene *'expert'* panels to aid in the derivation of questionnaire items (Vogt et al., 2004; Dillman, 2000). The term *'expert'* is used here loosely to refer to knowledgeable individuals or members of the population under study that may have special insight or experiences with the topic under investigation. "For instance, in a study of war-related stressors, veterans who have had these experiences may be the best source of information regarding how they should be conceptualized" (Vogt et al., 2004, 232-233). In similar fashion, this dissertation uses focused consultation with known-groups of environmentalists to build an Ecological Identity Scale with a high level of content validity. Indeed, such expert consultation is considered by some to be an essential aspect of content validation (Messick, 1995).

Despite the fact that focus groups can be used effectively in this way, the method is not without its weaknesses and it is important to recognize these up front. Critics of focus groups argue they have substantial biases that are difficult to control. For instance, it is likely that people willing to participate in a 60-90

[56] Criterion validity in particular; typically the approach is to use groups that are known to possess a characteristic measured by a certain scale to validate the scale.

minute focused discussion are of a certain personality type or may be especially interested in the topic. Secondly, an unskilled moderator can lead discussions into producing an inducement effect, whereby participants are compelled by social desirability to respond to prompts in expected ways. Still others charge that the interactive process between participants can yield a problematic lack of independence in responses, (i.e. group think), or that a dominant participant can overly influence the discussion. In sum, the risk in focus group research is that bias takes over the process and the information gathered in the meeting lacks any verifiable external validity (Bickman and Rog, 2009).

Risks aside, given the particular role focus groups play in this dissertation the problem of bias seems minimal. For instance, the criticism that only interested individuals would be willing to attend focus group sessions seems invalid in this case. Indeed, I am *primarily interested* in people with special interest or knowledge on nature, the environment, and environmental issues. Secondly, the concern about group think seems unrelated to the design used here because the theoretical underpinnings of (EI) are based on group dynamics and social categories. In this way, the focus groups are in many respects interested in information that is beyond the individual level (cf. Merton, 1987). Finally, strategies exist that can be used to orchestrate a focus group discussion and effectively control unwanted bias and distractions. For instance, one key strategy of controlling bias is to specify clear objectives and keep the conversation focused on them. Secondly, the moderator can govern the flow and direction of the conversation through verbal and non-verbal cues (encouragement, eye contact, etc). These cues can effectively reinforce continued discussion of particular ideas, and discourage others. In conclusion it seems that focus groups, like other methods of data gathering, are not appropriate for all types of research. The can however be very well suited for certain project, and this dissertation is one.

Stage I, Focus Group Research Design

Four focus groups (6-10 participants) of two different types were conducted to achieve the goals laid out in the prior section. The first three focus groups (Phase A) were held with leaders of environmental organizations, as they have been shown to hold known sets of attitudes, beliefs, and worldviews that are directly related to identification with nature and the biophysical environment (Kitchell et al., 2000). Two of these sessions drew participants from organizations external to the University of Tennessee, and one of the sessions drew participants exclusively from student environmental organizations. Given the exploratory nature of this stage in the study, systematic procedures were followed when selecting the organizations from which focus group participants were recruited. Specifically, the recruitment procedures involved purposively sampling from a range of organizations in an effort to cover the diversity of issues within and between these groups. Indeed, this form of sampling is appropriate for, "exploratory research…that will be systematically tested later", as has been done in Stage 2 and Stage 3 of this project (Salant and Dillman, 1994).

The fourth focus group (1 session with 6-10 participants) was held with a sample of UT undergraduate students drawn at random from the population of students between the ages of 17-29. This session served two primary purposes. First, it provided a baseline comparison/control group against which to compare qualitative data gathered between the two different types of groups. Secondly, it was used to ensure that the final survey reflected the normative views and understandings of the target population (UT undergraduates).[57]

Prior to all focus groups, interested participants were asked to complete a small web-based pre-focus group questionnaire. The responses to these questions aided in the final selection of participants. Upon completion of the focus group sessions, all participants were also asked to complete an exit

[57] As discussed in the literature review, this is a vital step in creating conceptual correspondence between the various indicators used in a study (cf. Fishbein and Azjen, 2010).

questionnaire (see appendix). Incentives in the form of refreshments during the sessions, and a 20 dollar gift certificate to a local restaurant were used to encourage participation. The protocol, order of events, objectives and questioning route were the same for focus group sessions.[58] The next section details the procedures followed during sampling and recruitment of focus group participants. First, the focus groups that targeted members of environmental organizations (Phase A) are covered; and second, the focus group that targeted a random sample of UT undergraduates (Phase B) is covered.

Recruitment Procedures, Phase (A)

Overview

As discussed above, three focus group sessions (6-10 participants each session) were held with leaders of local environmental organizations. Two of these sessions drew participants from organizations external to the University of Tennessee, and one of the sessions drew participants exclusively from student environmental organizations. The sampling and recruitment procedures for each of these three focus groups followed a similar set of **four (4) steps**. Each step is discussed in detail following a brief overview.

First it was necessary to define the theoretical population from which the target population and then the final sampling frame of individual members was created. It required clearly conceptualizing what is meant by "environmental organization", and then selecting organizations with characteristics that correspond to this conceptualization. Beyond meeting this conceptual requirement, Step 1 also involved assessing organizations on three other eligibility criteria; the availability of contact information, the organizations proximal location to the University of Tennessee-Knoxville campus, and the availability of information that described the organization. **Step two** involved categorizing

[58] The objectives and specific questions asked in the focus groups will be presented in the focus group results section of this chapter, and information on the protocol and order of events can be found in the appendix.

eligible organizations in relation to criteria identified in the environmental movement literature as representing meaningful differences between organization (discussed in detail below). This was done by referencing their mission statements and information on past and planned activities and events. **Step 3** involved systematic selection of one representative group from each of the categories identified in Step 2.[59] From this subsample of the population of eligible organizations a sample frame for the recruitment and selection of participants was created. The creation of this sample frame (**Step 4**) was done via direct contact with key informants within each of the selected organizations. Once the sample frame was created, invitation emails were sent to gauge the recruits' willingness to participate in the focus groups. Based on the responses to this invitation, a final sample of individuals was selected to participate. Each of these steps is discussed in greater detail below.

Stage I, Phase (A), Steps in Sampling of Environmental Organizations:

1) Establish the population of "Environmental organizations"
2) Purposive sub-sampling of environmental organizations
3) Systematic selection of one representative group
4) Creation of sampling frame and recruitment of participants

Step 1

For the Phase (A) focus groups, an environmental organization was considered *any group of adults age 18 or older who organize together for the primary purpose of preserving and protecting the environment and organisms and species within it.* This conceptualization ensured the focus group recruitment would include groups whose missions are ecological in scope, and whose members have likely internalized a strong ecological identity. To identify non-student organizations that met this conceptual criterion the *Tennessee Green Book*, an online listing of environmental organizations throughout the state

[59] This step was skipped for the student organizations, and instead only occurred for the non-student organizations.

of Tennessee, was consulted.[60] The Green Book is a product of the Tennessee Environment Council (TEC), and was originally created in 2009.[61] Web-links to each organization in the Green Book were followed and a list of 234 conceptually eligible organizations was created. Each of these organizations was then scrutinized based on the three (3) additional eligibility criteria listed below. Organizations that did not meet any one of these three criteria were deemed ineligible. Once the remaining eligibility criteria were applied, the 234 conceptually eligible organizations were narrowed to 64 organizations.

To identify student environmental organizations that met the conceptual criterion, an official in the University of Tennessee, Office of Sustainability was consulted. Over the past two years, this office has compiled a list of student environmental organizations on campus. A total of four (4) student organizations were identified as eligible.[62] In total then, 68 organizations constituted the target population of organizations.

Eligibility Criteria:

1) Contact Information: To be eligible, an organization had to have contact information that was readily identifiable through the organization's website or other publications available to the public (e.g. regular meeting times and locations, membership drives, etc).
2) Proximal Location: To be eligible, an organization had to have an office (satellite or main) or at least a regular physical presence via meetings or organized events and campaigns near Knoxville, TN (e.g. within a 50 mile radius).
3) Mission Statement: To be eligible an organization had to have a public mission statement and some record of past and planned events. These criteria will be vital for narrowing the population to a manageable subsample (steps #3 and #4 below).

[60] http://www.greenbooktennessee.com/
[61] Web-links to organization homepages and contact information are updated regularly.
[62] There were several organizations that were deemed ineligible due to a lack of readily obtainable contact information or several other reasons.

Step 2

Given that only a narrowed subsample of the target population of organizations was selected to create a sampling frame, it was important to ensure that the subsample covered the diversity of issues within and between local environmental organizations. Consequently, after the target population was established, the second stage in the sampling procedure was to identify subpopulations based on criteria that represent meaningful differences in purpose, mission, and actions taken between the different groups. Several studies, (Brulle, 1996 and 2000; Kitchell et al., 2000), have documented typologies of environmental organizations and discourses within the environmental movement, and an adaptation of these was used to identify meaningful subpopulations.[63] Referencing these studies resulted in the identification of nine (9) types of organizations within the target population 68. Based on a review of organization mission statements and past and planned activities, the 68 eligible organizations were then classified into the type they most closely reflect.[64] Table 4.1.1 (following page) provides a brief description of each organization type, and indicates the number of organizations classified in each of the category. As can be seen in the table, the 'Reform Environmentalist' category contained the largest number of eligible organizations. The 'Eco-theologist' and 'Radical/Deep Ecologist' categories only contained one (1) organization each. Finally, it is important to note that the four (4) 'Student' organizations that were identified were all affiliated with the University of Tennessee.[65]

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[63] Brulle (2000) uses a discursive frame and discourse analysis approach to identify nine major environmental discourses prominent within the US environmental movements. Kitchell et al., (2000) uses content analysis and personal in-depth interviews to find 9 different types of organizations.

[64] This was done by the principle investigator, Tobin Walton. Several organizations did not fit exclusively in one category, and were instead placed into more than one.

[65] Given that Stage 2 of this dissertation involves conducting a survey of UT students, 'Student' environmental organizations affiliated with other colleges and universities in the area were not included in the subsample.

Table 4.1.1 Typology of Environmental Organizations

Type of Environmental Organization/Discourse		Number of Organizations in Category
Civic	Locally based, usually focused on a specific issue in a community	13
Conservationist	Natural resource user groups focused on land conservation and habitat protection	15
Eco-theologist	Groups that see nature as God's creation and thus humanity has a moral obligation to tend to it	1
Environmental Justice	Groups that see ecological problems as a result of economic exploitation and organize on behalf of marginalized communities	3
Membership	State, national, or international mail in membership groups	15
Radical/Deep Ecologist	The richness and diversity of all life on earth has intrinsic value, these groups often engage in direct action (e.g. protests, demonstrations, civil disobedience)	1
Reform Environmentalist	Human health and ecosystem conditions are interrelated and maintaining both requires the use of technology and the natural sciences.	32
Student	Environmental organizations affiliate with colleges and universities and comprised of student members	4
Preservationist	Groups that see the continued existence of wilderness and wildlife, undisturbed by human actions as of primary importance	10

* Several organizations did not fit exclusively in one category, and were instead placed into more than one.

Step 3

Once the target population of non-student organizations was categorized, Step 3 involved the systematic selection of one group from each of the categories of the population.[66] To do so, two people (the principle investigator and another graduate student), rated the organizations in each category as reflecting greater or lesser correspondence with the category descriptions in the literature (cf. Brulle, 1996 and 2000; Kitchell, 2000).[67] Each rater assigned a rating of, 1= 'very low correspondence', 2 = 'low correspondence', 3 = 'medium correspondence', 4 = 'high correspondence', and 5 = 'very high correspondence' to each organization in each category. Thus, a rating of, 1, signified an organization whose mission statement and planned and past-activities exhibited a low correspondence with the categorical descriptions within which they were assigned. This produced a 2 by *k* table for each of the eight (8) non-student categories where *k* represents the total number of organizations within a given category (Table 4.1.2 below).[68] The organization within each of these eight (8) categories that received the highest inter-rater ranking was selected as the target organization for initial contact.[69]

Table 4.1.2 Ratings for Organizations

Organization Name	Rater #1	Rater #2
A	5	4
B	3	3
K		

[66] Given that one of the 3 focus groups sessions was held exclusively with members of student environmental organizations, each of the four eligible student organizations was kept as part of the subsample for participant recruitment for the third focus group. This step was thus skipped for student environmental organizations.
[67] For the purpose of rating I, (Tobin), created a list for each of the 10 categories containing the name, mission statement, and any available descriptions of past, (five years prior to analysis), and planned activities for each organization. Each rater considered all information and assigned a score.
[68] The ratings in these cells are merely for illustration and are not actual ratings.
[69] See appendix for more detailed information on inter-rater agreement criteria.

Six (6) of the eight (8) organizations that were selected received the highest rating, five (5), from both raters (i.e. inter-rater agreement). The other two (2) organizations that were selected also received the highest mean rating in their category, but were rated a five (5) by one rater and a four (4) by the other giving them a mean of (4.5).[70] These eight (8) organizations constituted the subsample from which a sample frame of individuals was constructed in order to recruit participants for the non-student organization focus group sessions (see Step 4 below).

Stage 4

Once the subsample of environmental organizations was established (both student and non-student), a sample frame for the recruitment and selection of participants was created. Creation of the sample frame developed differently for each of the three environmental meetings that transpired. This was partly a result of taking care to respect the privacy and busy schedules of organization leaders and representatives, and partly a result of leaving the exact recruitment procedures open to recommendations of organization leaders. Still, a basic protocol of communication was followed that included establishing contact with key informants within the organizations, and then using these informants to communicate all information about the research to other leaders.

The protocol involved first making *initial contact* with a representative, official, or leader by attending an organization event or meeting, or by telephoning someone listed on the organization website. This initial contact with an organization informant involved a brief introduction and requested a follow-up phone conversation to describe the research in greater detail. Next, a *follow-up telephone conversation* (15-20 minutes) with the informant was used to describe

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[70] To examine the reliability of the overall agreement between the two raters across all environmental organizations rated, (64), a Cohen's Kappa statistic was calculated. Cohen's Kappa is an inter-rater agreement statistic that controls for the possibility that agreement may occur due to chance alone. It ranges from 0 to 1 with a 1 being equivalent to perfect agreement. Kappa's of .7 are conventionally treated as illustrative of high inter-rater reliability. Kappa for the two raters here is acceptable .71

the research in greater detail, the risks and benefits to participation, and impress upon them the important role their organization could serve. Toward the end of the conversation the informant was asked if they would be willing to extend the opportunity to participate to other organization leaders and officials.[71] Each informant that agreed was sent, (via email), a set of documents to review and share with other organization leaders. These documents included a written description of the research and information on the benefits and risks participants may incur. Soon after, a final *pre-invitation telephone call* was made to answer any final questions the informants may have. Next, an *invitation email* was sent to the informant, and he or she was asked to forward the email to all leaders and officials within the organization along with some words encouraging their participation. Within this email a web link was provided, and recipients were instructed that by clicking on the link they would be redirected to a very brief web-based questionnaire that would gauge their level of interest in participating, and ask for some basic information that would be used to determine the selection of participants.[72] Finally, two weeks after the invitation email was sent, selection emails were sent to those chosen to participate. This email contained information on meeting time, location, a map, and instructions for parking. A brief review of these steps is listed below:

1) ***Initial contact*** with an organization leader(s): Briefly introduced research, and requested a telephone conversation to describe research in greater detail and explain how the respective organization could help.
2) ***Follow-up telephone conversation****:* Described research in detail, and asked for suggestions on how to best pursue participation by organization leaders.

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[71] If they agreed, they were asked for suggestions on the best way to proceed with recruitment and participation.

[72] One week after the invitation email has been sent to the organization informant, he or she will be sent a *reminder invitation email*, and asked to again forward the email to all interested leaders and officials within the organization along with some words encouraging their participation.

3) ***Written description of research and thank you (email)***: Thanked the informant for their time in the follow-up phone conversation, and provided a written description (pdf) of the overall research project and potential benefits and risks participants may incur.
4) ***Pre-Invitation telephone call***: Asked informants if they had any questions about the research, and if they would be willing to extend the invitation to their colleagues by forwarding an invitation email to them.
5) ***Invitation Email***: Described research and invited leaders to participate by providing a link to a pre-focus group questionnaire. A reminder email was also sent to informants one week after the invitation email.
6) ***Selection Email****:* Included meeting time, location, map, and parking instructions for those selected to attend.

Initial contact was attempted with the leaders from the 12 organizations selected in Step 3, (8 non-student organizations and 4 student organizations). Contact was made with leaders from 10 organizations, however leaders from two of the non-student organizations failed to respond in a timely manner; and so, the organizations with the second highest mean rating within their category (both 4.5 rankings) were contacted as a substitute. Consequently, over a two week period initial contact was ***attempted*** with leaders from a total of 14 environmental organizations (12 initial and 2 substitutes). Leaders from nine (9) organizations agreed to a follow-up telephone conversation (3 student and 6 non-student), and all nine (9) agreed to distribute invitations to their fellow organization members (Table 4.1.3 next page). These nine organizations were reflective of six different organization types (i.e. Conservationists, Environmental Justice, Membership, Reform Environmentalist, Student, and Preservationist).

Table 4.1.3 Sampling of Environmental Organizations

Number of Organization Categories Targeted	9
Number of Organizations Contacted	14
Follow-up Telephone Conversations	9
Organizations Agreeing to Distribute Invitations	9
Total Number of Org's. Represented in Focus Groups	9
Total Number of Categories Represented in Focus Groups	6

Focus Group Descriptions, Phase (A)

Earlier it was noted that although systematic sampling of organizations was used to ensure that a range of diverse organizations were represented in the focus group meetings, the recruitment of participants from within the targeted organizations was left open to the recommendations of informants. For this reason, each of the environmental focus groups had a unique makeup that is important to address. The following section discusses specific details about the selection of participants for each of the Phase A meetings and provides some general information about their make-up.

Focus Group Meeting 1 (Non-Student Environmental Organization)

The selection of participants for focus group **meeting 1**, resulted from a unique opportunity extended by the leaders of a large chapter, (approximately 1084 members spanning 21 Tennessee counties), of a *preservationist* oriented *national membership organization*. The informant for this organization was an officer on the organization's executive committee. After the initial contact and follow-up phone meeting, the informant spoke with the remaining executive committee members and the decision was made to invite me to host a focus group session at their annual business retreat (January 4th, 2014). This seemed

to be an excellent opportunity, and I accepted the offer.[73] There were 14 members of the executive committee in attendance at the retreat, and 9 gave their consent and participated in the focus group. The meeting was held in the home of one of the participants.

Demographic information gathered from the exit questionnaire indicated that the participants in this focus group meeting constituted a fairly homogeneous group. All participants identified themselves as white. All have at least a Bachelor's degree and five (5) hold degrees higher than a Master's degree. Seven are male and one is female, and the age range is from 49 to 64 years old. Income appears skewed toward the higher end with 50% of participants reporting total family incomes above $100,000. Finally, the most variability occurs within the number of years participants report being a member of an environmental organization, which ranges from three to 12 years.

Focus Group Meeting 2 (Non-Student Environmental Organizations)

The make-up of focus group **meeting 2** was significantly more diverse, in large part because recruitment followed the design discussed in Step 4 much more closely. For this meeting informants from five (5) different organizations sent out a total of 16 invitation emails to their colleagues. These five (5) organizations reflected four (4) different organizational categories; Environmental Justice, Conservationist, Reform Environmentalist, and Preservationist. Twelve (12) leaders responded to the invitation and completed the pre-focus group questionnaire. The level of interest seemed high as five (5) reported being *very interested* and seven (7) reported being *interested* in participating in the focus group. All 12 were selected to participate and 8 attended.

In addition to representing a greater diversity of organization types, the demographic characteristics of this group were notably more diverse than focus group meeting 1. Information gathered in the exit questionnaire indicated greater

[73] Given that the selection of participants was already established the pre-meeting questionnaire step was abandoned

diversity in terms of income, sex, age, and years as a member of an environmental organization. Half of participants were female and half were male. Total yearly family income ranged from 'Less than $10,000' (n=2), to "$40,000-$60,000" (n=3). Age of participants ranged from 25 years to 68 years old. The lowest level of education reported was a 'bachelor's degree' (n=5), and the highest level of education reported was 'higher than a Master's degree' (n = 1). The number of years participants report being a member of an environmental organization ranged from just over two (2) years to 40 years. Despite this diversity, all participants identified themselves as white.

Focus Group Meeting 3 (Student Environmental Organization)

Focus group ***meeting 3*** was comprised exclusively of leaders or highly active members of undergraduate student environmental organizations. Informants from three (3) different organizations reported sending out a total of 45 invitation emails. These organizations have diverse sets of interests. For instance, one organization was exclusively focused on organic and sustainable food production and distribution on campus, while a second organization focuses primarily on promoting and developing green initiatives in the dorms and other buildings on campus. Finally, the third organization has a much more general focus and is very active in hosting educational events and awareness campaigns covering a wide array of issues. Thirty three (33) leaders or highly active members responded to the invitation and completed the pre-focus group questionnaire. Interest seemed high as 16 (49%) reported being *very interested*, and 14 (42%) reported being *interested* in participating in a focus group. In fact, level of interest appeared to be a little higher than in meeting 2.

Given the exclusive student make-up of this meeting, some distinct demographic differences were expected to exist between these participants and those in the other environmental meetings. Predictably, age ranges were markedly lower, (18-22 in Session 3 and 25-68 in session 1 and 2). Secondly, given that these are all currently enrolled undergraduates, levels of educational

attainment are markedly lower in session three (3) as well. Length as a member in an environmental organization differed significantly between this and the other two environmental focus groups meetings (Median years in session 3 = .75 years and across sessions 1 and 2 = 6 years). Session three was however fairly evenly split in terms of gender with 3 females and 5 males; and similar to the first two sessions, the racial make-up of session 3 was predominantly white.

Recruitment Procedures, Phase (B)

As stated above, in addition to the three focus groups held with leaders of environmental organizations, a fourth focus group (6 – 10 participants) meeting will be held with a random sample of UT students (Phase B). This group will function as both comparison/control group and ensure that the final survey instrument is designed in a fashion that reflects the views and opinions of the target population (UT undergraduates). The procedures for the recruitment of participants for Phase B are described below.

To identify currently enrolled UT undergraduate students to invite to participate in this research, a random sample of 200 email contacts was obtained from the UT registrar's office. With the final goal of successfully recruiting six (6) to ten (10) participants, it was assumed that 40/200 (20%) would respond as interested, 15 would be selected to attend, and six (6) to ten (10) would attend. The sample of email contacts was obtained by submitting a *Student Data Report Request Form,* to the *Associate Registrar for Reporting.* The sample was received from the registrar as a Microsoft excel spread sheet. The student contact information from the master file was uploaded into the Qualtrics survey software program via the Principle Investigator's graduate student Qualtrics account.

Next an invitation email was sent to the 200 students. This email briefly described the research and information on the potential risks, benefits and

incentive for participation.[74] Within this email a web link was also provided, and recipients were instructed that by clicking on the link they would be redirected to a very brief web-based questionnaire that would gauge their level of interest in participating, and ask for some basic information that would be used to determine the final selection of participants (see appendix).[75] Finally, two weeks after the invitation email was sent, selection emails were sent to those who were selected. This email contained information on meeting time, location, a map, and instructions for parking

Focus Group Meeting 4 Description (UT Undergraduates)

A total of 200 invitation emails were sent out, and response was significantly lower than expected. The expectation was that 40 of the 200 (20%) initial email invitations generate responses to the pre-meeting questionnaire; instead 13 of 200 did so (6.5%). As was expected, the level of interest in participating for the 13 students who responded was notably lower than for both focus group meeting 2 and 3; four (4) students indicated they were *interested* and the remaining nine (9) indicated that they were only *somewhat interested* in participating in a focus group. All 13 students who responded to the pre-focus group questionnaire were selected to attend and a total of five (5, 38.5%) did so.

Given the exclusive undergraduate student make-up of this meeting (as with meeting 3), some distinct demographic characteristics were expected to. Exit questionnaire results indicate that the age range was markedly low and homogeneous with two participants indicate they were 18 years old, and three (3) indicating they were 19 years old. Total family income was somewhat spread out ranging from 20 - $40,000 to Over $100,000. Two (2) participants identified themselves as white males and one (1) identified as a black male, while the remaining two (2) participants identified themselves as white females. None of

[74] As indicated above, all focus groups involved incentives in the form of refreshments during the meeting and a $20 gift certificate to a local restaurant.
[75] One week after the invitation email was sent a *reminder invitation email was sent to any students in the sample who had not yet responded to the first invitation*.

the five (5) participants reported being a member of an environmental organization.

Summary Results: Stage I, Phase (A) and (B) Recruitment and Sampling

Overall, the recruitment of participants for these focus group sessions was very successful. As the figures in Table 4.1.4 (next page) indicate, 17 leaders and officials from 6 different non-student environmental organizations attended a focus group meeting; and 8 leaders or highly active members of three (3) student environmental organizations attended a meeting. Anecdotal evidence from attending meetings and informal discussions with organization leaders suggests that across all of these groups, the total number of leaders and/or highly active members is somewhere in the range of 70 to 125. This equates to coverage, (in the environmental focus groups), in the range of 20 to 36%. The effectiveness of this design and its implementation is further supported by the fact that, 6 of 9 organization types that were targeted were represented in these meetings.

Recall that the objective of this design was not to achieve representativeness, but instead, to ensure that the sample covers some of the key issues of variability within and between local environmental organizations. The data presented above suggests indicates that this was accomplished. This in turn offers strong support for the content validity of the EIS items given that were derived from systematic consultation with known-groups. That being said, there are several important weaknesses to note. First, there was clear underrepresentation of racial and ethnic minorities across all of the focus group meetings. Furthermore, three (3) types of organizations were not represented in the focus group meetings. Indeed, the insight and perspective of Eco-theologist, Eco-feminist, and Civic type organizations is under-represented in this research.

Table 4.1.4 Summary Results: Sampling, Recruitment and Focus Group Attendance

Focus Group Meeting	Invitation Emails Sent	Completed Pre-meeting Questionnaires	Selected to Attend	Attended
Meeting 1 (Non-Student Environmental Organizations)	14	N/A	14	9 (64%)
Meeting 2 (Non-Student Environmental Organizations)	21	12 (57%)	12	8 (50%)
Meeting 3 (Student Environmental Organizations)	45	33 (73%)	11	8 (73%)
Meeting 4 (General Population Students)	200	13 (7%)	13	5 (39%)

Stage I Focus Group Results

Overview

The overall objective of the focus groups was to gather information pertaining to people's perceptions of themselves in relation to the bio-physical environment. A list of objectives was created to draw out information from focus group participants that could be used as a basis for the construction of items to comprise the EIS scale. Each objective was designed to tap into each of the three dimensions of EI on both levels of analysis at which EI is assumed to operate. The results of the information obtained in these focus groups are presented below.

The section begins by describing the procedures taken to analyze and assess this qualitative data. The second section details some of the qualitative or interpretive findings and assesses the extent to which the expectations described at the end of Chapter 3 were confirmed. The third section presents findings that are quantitative in nature and provides a concrete linking of the *focus group objectives*, the *EI framework* and *statements made by participants*. It concludes by listing the specific EIS scale items that were derived from the focus groups.

Analytical Procedures

Several different strategies were used to analyze the information provided by participants in these focus groups. First, as the lead facilitator and principal investigator, deep and contemplative reflection upon the experience of observing these discussions was a valuable analytic tool. I spent many hours reflecting on comments, intonations, and the overall direction of these discussions. Moreover, the quality of my reflections was enhanced in several ways. First, immediately following each focus group session, I discussed the events with my co-facilitator. This allowed us to compare and contrast what each saw to be meaningful and important facets of the meetings. Secondly, audio recordings of each session were made, and this allowed me an ability to re-visit the meetings from a more analytical vantage point. As a rule, I listened to the full recording of each meeting within 24 hours after it concluded.

Each audio taped session was listened to on two additional occasions, one to create transcriptions, and one to create an abbreviated set of notes that paraphrased important aspects of the conversations that transpired. Full transcripts were created by listening to the audio recordings in a slow play mode while typing conversations complete with anonymous name indicators. Each focus group session lasted around 1 hour and 15 minutes, and the transcription process took around 31/2 hours for each session. Having the transcripts is a vital resource, but going through the process of creating them allowed me to systematically review and relive the discussions, again from a more analytical

vantage point. The paraphrased notes were produced around three weeks after each session. To do this, I listened to the audio recording in real time, stopping and pausing to type paraphrases of comments, and what appeared to be shifts in conversational theme. This truncated transcription was valuable in comparing and contrasting conversational trends across different focus group sessions. Finally, a coding scheme was devised and applied to the full transcripts, the paraphrased notes, and the open -ended questions about pro-ecological behaviors in the exit survey. This involved extracting comments made by participants from these sources and attaching a code to them. The code attached to these comments documented several pieces of information about them. First it documented ***the source of the comment*** (i.e. focus group or exit questionnaire)**.** Second, the code identified ***which focus group meeting*** the comment appeared in (i.e. Meeting 1, 2, 3, or 4). Third, it indicated ***which dimension of EI*** (i.e. sameness, differentiation, centrality) the comment most closely related to. Fourth, the code indicated ***which level of analysis*** (i.e. role-based or social-based) the comment most closely related to. An example of a comment extracted from the transcripts of focus group 3 with the code attached appears in Figure 4.2 below. The code indicates that the comment "I think about where the things I consume come from", was extracted from a focus group discussion, in focus group meeting 3, and the comment most closely relates to the sameness dimension of EI on the role-based level.[76] All comments from transcripts, notes, and exit questionnaires were coded in this manner and then grouped into thematic lists for analysis.

[76] Notice for instance how the language is in reference to a behavioral disposition or role that acknowledges an interrelationship between the self and the ecosystem.

"I think about where the things I consume come from"

Code = F-3-SAME-ROLE

F = Focus group (alternative is EXIT)

3 = Focus group meeting 3 (alternatives are 1, 2, & 4)

SAME = Sameness Dimension of EI (alternatives are DIFF & CENT)

ROLE = Role-based level of analysis (alternative is SOC)

Figure 4.2 Focus Group Coding Example

Abstract Interpretive Findings

Recall from chapter three that one theoretical assumption of the EI framework is that it can be affectively analyzed on both the individual role-based and social-categorical levels of analysis. Moreover, it was expected that this would be demonstrated in linguistic cues and shifts between 'I' and 'We' language (cf. Weigert, 1986). These linguistic cues and shifts were prevalent within the focus group discussions and comments. Consider the examples in Table 4.1.5 below. Note the difference in language and the shift from 'I' to 'We'. In the comments below, 'I' connotes a unique set of meanings, expectations, and characteristics the individual is attaching to them self as one who shares a relationship with the environment. Alternatively, in the comments to the right, 'We' connotes recognition of group membership and the projection of certain characteristics onto the self and other. Interestingly, this occurred in all focus group meetings, although these types of comments were more numerous and wider in scope in the environmental group meetings (focus group meetings 1,2,3) as opposed to the meeting with UT students (focus group meeting 4) . This is an important result and lends strong support to the construct validity of EI. Indeed signs of these linguistic shifts provide support to the validity of the EI framework by confirming the assumption that EI can be analyzed on both

Table 4.1.5 Expressions of the Different Levels of Identity

Role-Based Identity Expressions	Social-Based Identity Expressions
"I try not to destroy natural habitats"	"We are all nature"
"I think about where my energy comes from"	"We destroy nature more than other creatures"
"I am personally a part of nature"	"We belong to nature"

A second, yet unexpected finding, that supports the assumption that EI operates on both a role-based and social-based level of analysis emerged in the discussion generated from the following question, "*To what extent do you see yourself as being similar to (or the same as) environmentalists, and if so, what are some of the ways?"* The responses to this question were interesting because across all environmental group meetings, there was a distinct reaction that was not found in the non-environmental group meetings. In each of these meetings the conversation immediately centered on attempts to define the characteristics of an environmentalist. For instance, one illustrative comment from a participant in focus group meeting 1 was, "*what do you mean by environmentalist?"* Moreover, most participants in the environmental group sessions distanced themselves from this label, arguing for instance that, *"I don't think of myself as an environmentalist, but others probably label me that".*[77] The overwhelming conclusion in these sessions was that the social category '*environmentalist'* did not fully embody the diverse type of people whom are cast in this manner. In contrast, such a discussion never occurred in focus group meeting 4 (Non-environmental group). Instead, this discussion seemed to be guided by an assumption that the label '*environmentalist'* is clearly defined and applies to a specified group of people. These exchanges clearly relate to the notion of *meta-contrast,* and the nature of intergroup interaction, perception, and stereotyping

[77] (Focus group meeting 3)

(cf. Tajfel, 1981). Consequently, this offers more support for the validity of the EI construct.

Another expectation for the focus groups mentioned in Chapter 3 related to the differentiation dimension of EI. Specifically, it was expected that focus group participants (at least those in the environmental group meetings) would readily identify salient oppositional others and outgroups. It was argued that differentiation would be evident if focus group participants identify and stigmatize particular roles as anti-environmental and irresponsible, or project negative attributes and evaluations onto oppositional others such as political or industry groups. Question number nine (9) in the meetings was designed to target the differentiation dimension by asking, "*Are there any groups of people that you see as the opposite of you, or as 'outsiders', expressing a fundamentally different view of nature and their place in it than you do?* In the environmental focus group meetings, the reactions to this question were quick and clear. These participants readily identified groups that they see as opposite themselves (Many of these groups are listed in Table 4.29 below). Moreover, this question generated some of the more animated responses; '*Republicans', 'Conservatives', 'Capitalists', and 'Consumers'* are example of some of the groups mentioned . Contrasting this were rather innocuous and non-existent responses to this question in the non-environmental group meeting. Whereas this question generated nearly eight minutes of conversation in each of the environmental group meetings, there was very little time devoted to discussing this question in the other meeting. The difference in responses to this question between groups is an important finding that offers strong support for the validity of differentiation dimension of EI.

Specific/Quantifiable Findings

The section below is organized in accordance with the focus group objectives and hypothesized dimensions of EI. Each objective is first listed with the specific questions asked of participants in reference to the objective. Next, a table containing thematic categories that were derived from patterns in the

responses to the questions is presented. The table also contains quotes from participants that illustrate the thematic category, and the particular dimension of EI that the question, responses, and thematic categories relate most closely to. After each table the particular EIS scale items created from this analysis are presented.

Sameness with Nature and the Biophysical Environment: (Objective 1) Uncover the extent and degree that focus group participants see themselves as similar to (or the same as) nature and the biophysical environment. Determine the content and attributes of how this similarity is experienced, (i.e. what are the meanings they attach to both themselves and the biophysical environment?)

Focus Group Questions:

1) To what extent do you see yourself as being similar to nature and the biophysical environment, and if so, what are some of the ways?
2) How are these things expressed in 'who you are', 'what you 'do', 'what you 'have', and in 'what you 'know'?

Using the analytical procedures and strategies discussed above, the comments and discussion that emerged from questions one and two were used to derive thematic categories (Table 4.1.6 next page):

The following five (5) survey items were derived to measure the themes of EI reflected in the table below.

I am someone who…

Is aware of and cares about my impact on the environment
Is strongly connected to nature and the environment
Is a protector/nurturer of wildlife and their habitats

We (humans) are…

Similar to other animals in our biology, basic needs and drives
A part of nature

Table 4.1.6 Focus Group Objective One: Thematic Categories Derived from Responses to Focus Group Questions

Dimension Targeted by Question	Thematic Categories Derived	Illustrative Quote
Sameness with Nature Role-Based Identification	Sustain Habitats	"I try not to destroy natural habitats"
	Eco-Friendly Eating	"I try not to be ignorant about where my food comes from"
	Spending Time in Nature	"I feel closer to nature in some places than others"
	Awareness of Impact Nature/Environment	"I think about where my energy comes from"
	Personal Connection	"I come from nature"
	Non-Consumption	"I try not to consume too much"
Sameness with Nature Social-Based Identification	Human Embeddedness	"We are all nature"
	Human Sustenance	"Humans are made up of natural materials"
	Natural Drives	"Humans like other animals adapt to their environment"

Differentiation from Nature and the Biophysical Environment: (Objective 2) Obtain information about the extent and degree that focus group participants see themselves as different from nature and the biophysical environment. Determine the content and attributes of how this difference is experienced. That is, what are the meanings they attach to themselves as human that they do not attach to nature and the biophysical environment and conversely, what are the meanings they attach to various elements of the biophysical environment that are not attached to humans?)

Focus Group Questions:

1) To what extent do you see yourself as being different from nature and the biophysical environment, and if so, what are some of the ways?
2) How are these things expressed in who you are', 'what you 'do', 'what you 'have', and in 'what you 'know'?

Using the analytical procedures and strategies discussed above, the comments and discussion that emerged from questions one and two were used to derive thematic categories (Table 4.1.7 below):

Table 4.1.7 Focus Group Objective Two: Thematic Categories Derived from Responses to Focus Group Questions

Dimension Targeted by Question	**Thematic Categories Derived**	**Illustrative Quote**
Differentiation from Nature Role-Based Identity	Separation	"Its sometimes hard to see myself as a part of nature"
	Consumption	"I can use energy in ways that other life forms cannot"
Differentiation from Nature Social-Based Identity		"We destroy nature more than other creatures"
	Destruction	"We seem to think there are no limits on population growth"
	Intelligence, Knowledge and Technology	"We are different in the amount of education and knowledge we have"
	Consumption of Resources	"We are different in our overconsumption"
	Organization and Size	"We require industrial scale activities to maintain our lifestyle"
	Modification of Environment	"We are different in the way we build and construct our environment"

The following three (3) survey items were derived to measure the themes of EI reflected in the table above.

We (humans) are…

Separated from nature because of the way we live

We (humans) are different from other animals

Because of our knowledge, technology and organization

Because of the amount of resources we consume

Sameness with Environmentalists: (Objective 3) Uncover the extent and degree that focus group participants see themselves as similar to (or the same as) "environmentalists". Determine the content and attributes of how this sameness is experienced (i.e. what are the meanings they attach to both themselves and the social category of "environmentalist"?)

Focus Group Questions:

1) To what extent do you see yourself as being similar to (or the same as) environmentalists, and if so, what are some of the ways?
2) How are these similarities expressed in 'who you are', 'what you 'do', 'what you 'have', or 'what you 'know'?

Using the analytical procedures and strategies discussed above, the comments and discussion that emerged from questions one and two were used to derive thematic categories (Table 4.1.8 next page):

The following three (3) survey items were derived to measure the themes of EI reflected in the table below.

I am someone who…

Views myself as an environmentalist

Is trying to be a better environmentalist

I identify with people who…

Make significant changes in their lifestyle for environmental reasons

Focus their life on improving and protecting the environment

Table 4.1.8 Focus Group Objective Three: Thematic Categories Derived from Responses to Focus Group Questions

Dimension Targeted by Objective	Thematic Categories Derived	Illustrative Quote
Sameness with Environmentalists Role-Based Identity	Change in self	"I am willing to make some degree of sacrifice because of my concern about the environment"
	Concern for others	"I consciously try to reduce harm to others (non-human)
	Awareness of Impact	"I think about the impact of the daily products I use"
	Knowledge	"I try to keep myself informed about the environment"
Sameness with Environmentalists Social-Based Identity	Goals Consistency	"I share the same goals as environmentalists"

Differentiation from Environmentalists: (Objective 4) Obtain information about the extent and degree that focus group participants see themselves as different from the larger category of environmentalists. Determine the content and attributes of how this uniqueness is experienced (i.e. what are the meanings they attach to themselves as people who "protect" the environment that they don't attach to "environmentalists", and conversely, what are the meanings that they attach to "environmentalists" that they do not attach to themselves?)

Focus Group Questions:

1) To what extent do you see yourself as being different from "environmentalists"?
2) How is this uniqueness expressed in 'who you are', 'what you 'do', 'what you 'have', or 'what you 'know'?

Using the analytical procedures and strategies discussed above, the comments and discussion that emerged from questions one and two were used to derive thematic categories (Table 4.1.9 below):

The following two (2) survey items were derived to measure the themes of EI reflected in the table above.

I am someone who…

Is trying to be a better environmentalist

Others view as being an environmentalist

Table 4.1.9 Focus Group Objective Four: Thematic Categories Derived from Responses to Focus Group Questions

Dimension Targeted by Question	**Thematic Categories Derived**	**Illustrative Quote**
Differentiation from Environmentalists Role-Based Identity	Work-in-progress Environmentalist	"I accept that I am an imperfect environmentalist"
	Different Actions	"I differ in the types of things I do to be good to the environment"
	Knowledge	"I am less educated about environmental issues than most environmentalists"
	Extremity/Intensity	"I live more comfortably than most environmentalists"
	Social Constraints	"I don't live in a social environment that is conducive to being an environmentalist"
Differentiation from Environmentalists Social-Based Identity	Unclear Label/Category	"I wouldn't place the category "environmentalist" on myself"
	Misrepresented	"I am not a hippie that lives in a tree house"

Differentiation from Oppositional Others: (Objective 5) Uncover who/what categories and groups constitute salient oppositional others for focus group participants. Determine the content and attributes through which this differentiation is experienced (i.e. what are the meanings they attach to salient "oppositional out-groups"?)

Focus Group Questions:

1) Are there any groups of people that you see as the opposite of you, or as 'outsiders', expressing a fundamentally different view of the world and their place in it than you do?
2) If so, who are some of these groups?
3) What is it about 'who they are', what they do', 'what they have', or 'what they know', that makes them so different from you?

Using the analytical procedures and strategies discussed above, the comments and discussion that emerged from questions one and two were used to derive thematic categories (Table 4.1.10 next page):

The following ten (10) survey items were derived to measure the themes of EI reflected in the table below.

I identify with people who…

Are more interested in making money than in other things

Feel they have the right to consume as much as they want.

Don't care about their environmental impact.

Doubt global warming is happening.

Doubt global warming is mostly caused by humans

I identify with…

Most Republicans and Conservatives

Groups that promote business interests

Big business and corporations

The typical American consumer

Capitalism and the free-market system

Table 4.1.10 Focus Group Objective Five: Thematic Categories Derived from Responses to Focus Group Questions

Dimension Targeted by Objective	Thematic Categories Derived	Illustrative Quote
Differentiation from Oppositional 'Other' Role-Based Identification	Promethean	"People who think humans will invent their way out of these problems"
	Exceptionalists	"People who feel superior to nature"
	Profiteers	"People that are primarily motivated by money"
	Egocentrics	"Self-centered egotistical people"
	Over Consumers	"Mindless, thoughtless overconsumers"
	The Status Quo	"I take steps to go against the status quo because it is unsustainable"
	Unaware/Unconcerned	"People that don't care where there energy comes from"
Differentiation from Oppositional 'Other' Social-Based Identification	Big Money	"the Koch brothers"
	Business Interests	"Chambers of Commerce"
	Republicans/Conservatives	"All Republicans"
	Climate Change Deniers	"Climate Change Deniers"
	American Consumerism	"The typical American consumer"

Exit Survey Results: Open-ended Environmental Behavior Questions

Recall from above that an exit questionnaire (See appendix) was distributed following each focus group session. The primary function of it was to identify, through a series of open-ended questions, commonly held beliefs about what types of behaviors are thought to be good for the environment, what types of behaviors are thought to be bad for the environment, and which one's of each type focus group participants regularly engage in. The open-ended responses to these behavioral questions were used to construct an index of pro-ecological behavior. To do so, the responses were coded in relation to the specific focus group meeting from which they came, and then typed into a list. From there, responses were compared and contrasted between and across groups to identify trends and patterns. These trends and patterns were then used to inductively derive four (4) thematic behavioral categories. Presented in Table 4.1.11 (next page) are the four (4) thematic behavioral categories of pro-ecological behavior that were derived from this process. Also presented in the table are quotes from the exit questionnaires that are illustrative of the category. Following the table, the items that were derived from these categories are presented. These items constitute the pro-ecological behavior index that was used to test the validity and reliability of the EIS scale in Stages 2 and 3. The following (14) survey items were derived as an index of the thematic behavioral categories of pro-ecological behavior in the table below:

How frequently do the following things when you have the opportunity to decrease your overall energy/resource use, and impact on the environment and others?

Learning more about how my action and the actions of others impact the environment and the future.

Learning more about how and where our food, goods, energy, and wastes are produced and distributed.

Learning more about myself and my connection with wildlife, nature and the environment

Reducing my overall purchases and use of products and materials

Reusing products and materials as long as I can

Repairing or properly maintaining the things I use or own

Recycling the things I use or own

Buying or consuming food and beverages that take less energy and resources to produce and distribute

Buying or using products that take less energy/resources to produce and distribute

Buying or using energy efficient products and materials

Using motor vehicles that are more energy efficient

Driving motor vehicles less

Walking, bicycling or using public transport and carpools

Using less energy for heating, cooling and electricity

Table 4.1.11 Thematic Categories of Pro-ecological Behavior Derived from Responses to Open-Ended Exit Questionnaire Items

	Thematic Behavioral Categories Derived	**Illustrative Quote**
Pro-Ecological Behavior	Consumptive Behavior	"…minimize consumption of resources"
	Waste Disposal Behavior	"...reuse and recycle"
	Cognitive/Educational Work	"…think through where everything comes from"
	Activist/Citizenship Work	"…help raise environmental awareness among others"

Stage (2): Web-based Student Survey, Design and Results

Overview

The survey Stage (2) occurred in two phases. Phase (A) involved a short web-based pre-test questionnaire distributed to a sample of UT students (n = 220) in order to conduct a statistical power analysis. This pre-test power analysis was used to ensure accurate conclusions when testing the validity of the EIS scale in Phase (B). Phase (B) involved a longer web-based survey distributed to a much larger sample of UT students (n = 4350) in order to conduct formal validity testing on the EIS scale. The design and results of each phase are discussed in detail below; however, it is first necessary to provide a discussion of the overall statistical approach being used in this dissertation.

Perspective on Statistical Modeling and Web-based Surveys

Recall from earlier chapters that the Ecological Identity (EI) framework is theoretically grounded in a pragmatic symbolic interactionist perspective, and it is assumed to exist as an emergent property of socio-historical and bio-physical relationships. EI is thus comprised of regularities of thought and action that are, "not ontological but epistemological realities" (Brubaker et al., 2004, 45). Given these assumptions, the research design used to construct the close-ended indicators that comprise the EIS scale began by using focus groups to consult with individuals assumed to possess characteristics directly related to EI. In this way, the theoretical underpinnings of EI aligned with the methodology used to construct the EIS scale. In similar fashion, the theoretical underpinnings of EI deemed particular statistical techniques more appropriate than others. Specifically, an ***Information-theoretic approach*** that incorporates a statistical power analysis was chosen because it corresponds with the theoretical foundations of the EI framework.

"During the past twenty years, modern statistical activity has been moving away from traditional formal methodologies based on statistical hypothesis testing" , and toward information based approaches (Burnham and Anderson,

1998, 20). One reason for this change is because of problems with p-values and study comparability (discussed below). This change has also resulted from a paradigmatic philosophical shift by many statistical analysts away from techniques that assume a true model to exist (i.e. null-hypothesis testing). Instead an information-theoretic perspective assumes statistical models are mere approximations of reality, and the goal is to test multiple models to select which model best approximates the data in the most parsimonious way.[78]

Information-theoretic approaches and statistical power analyses have gained in popularity within the social sciences, and are well suited for the data analysis in Stage 2 of this dissertation.[79] These approaches constitute a set of steps to be followed when analyzing empirical data, and can be contrasted from traditional null-hypothesis testing which relies almost exclusively on significance tests to assess models and the inferential capabilities of parameter estimates (Burnham and Anderson, 1998). With null-hypothesis testing, a researcher poses a hypothesis and then conducts a statistical analysis within the available data to test its null (i.e. the absence of the hypothesized relationship). To determine whether to accept or reject the null, a probability statistic (based on probability and sampling theory) is calculated. The *p-value* gives the probability that a model parameter or test statistic (e.g. regression coefficient, t-statistic, etc) could occur by sampling error (or chance). A low p-value (e.g. $p \leq .05$) suggests a low probability that the null is true, and thus offers indirect support for the hypothesized relationship(s) because of the low probability that the null is true (i.e. the relationship does not exist). The assumption then is that the hypothesized relationship represents the 'true' relationship that exists in reality and these 'true' relationships have produced the data that the researcher sampled.

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[78] This shift is likely related to the shift to a Post-normal science within many disciplines and toward a Critical Human Ecology within Environmental Sociology in particular. The connections between them however escape the scope of this particular project.

[79] This approach also form the basis of the Stage 3 analyses.

The use of null-hypothesis testing, (and the assumptions that go along with it), as the primary criteria for model development and inference is significantly problematic for the accuracy and comparability of findings. One reason is because researchers within the social sciences typically do not conduct statistical power analyses prior to significance testing in order to determine an appropriate sample size.[80] This can be a problem because differing sample sizes can affect the validity of p-values. Instead, sample sizes are routinely determined by assumptions about response rates and variability within the target population. Although these are important considerations they usually result in a bias toward larger samples. While larger samples increase the statistical power of a test or study, they also increase the likelihood of finding statistically significant results when substantively there are none (i.e. Type I error, false positive); conversely, too small of a sample size results in an increased likelihood of not finding results when they do exist (i.e. Type II error, false negative). These issues have consequences for the validity and comparability of findings across studies, but can be affectively addressed by conducting an a priori power analysis to determine an appropriate sample size that will ensure more valid significance tests (see Phase A below).[81]

This dissertation used an adaptation of Burhnam and Anderson (1998) as a strategy to guide the statistical analyses and validity testing. It combines an a priori power analysis with information-theoretic techniques of multi-model comparison. The strategy began by conducting a short web-based pre-test questionnaire (Phase A) completed by a small sample of UT students (n = 23). The questionnaire was designed to obtain preliminary information about the target population (UT students) in order to conduct a pre-test power analysis.

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[80] Statistical power is defined as the ability of a test to detect if an hypothesized effect actually exists (High, 2000). Two studies on the same subject can both produce statistically significant p-values but if the statistical power of the tests is not reported (which is typically the case) then there is no basis for comparability.

[81] See Anderson (2000) for a more detailed discussion of additional problems with traditional null-hypothesis testing.

Phase B involved a longer web-based survey that was completed by a much larger sample of UT students (n = 497). The Phase B survey contained the items that make up the EIS scale, an index of General Ecological Behaviors, and indicators of several other constructs frequently used in this area of research (e.g., worldview, values, environmental concern). Data from this survey was used for testing the validity and reliability of the EIS scale. The design and results of each phase are discuss in detail below; however, given that a web-based format was used for both phases, it seems important to address some of the advantages and disadvantages of this format first.

Web-based surveys

A web-based survey was employed for both Phase A and Phase B of Stage 2. Web-based surveys have some advantages when compared to the more traditional telephone and mail surveys. First, web-based surveys are relatively cheap to conduct, and they can be executed in a much quicker time frame than traditional survey methods (Schaefer and Dillman, 1998). Secondly, web-based and email surveys have been shown to "minimize *social desirability* bias", because of the relative anonymity granted to respondents. This second advantage seems to be of special significance to this project given that environmentalism and environmental values have become both normative and contentious. Consequently, a mode of delivery that can minimize social desirability bias is especially advantageous to this project.

Aside from these benefits, web-based surveys are not immune to contemporary shifts in the overall survey research environment, such as the problem of increasingly low response rates in all modes of survey delivery. Indeed, a disappointing aspect of web surveys is that they do not contribute to solving the problem of decreasing response rates" (Bethlehem and Biffignandi, 2012, 48). This is due in part to user-end problems such as web-browser compatibility issues, slow modem speeds, and unreliable connections. Especially problematic in this regard can be the inability to adjust the formatting

of surveys to be as readable on smart phones as they are on desk top or laptop computers. Web-based and email surveys also have problems with sampling error and under coverage, due to differential access to the internet, and the lack of availability of sampling frames (i.e. target population is wider than internet population).

These problems with response rates aside, this dissertation benefitted from the fact that there was a readily available and exhaustive sampling frame of the target population (UT undergraduates) via the registrar's office. Furthermore, several efforts were taken to boost response rates. First, informal pilot-testing of both the pre-test questionnaire, (Phase A), the full survey, (Phase B), was conducted via a convenience sample of UT undergraduates.[82] This pilot-testing provided information that helped to rectify potential technical obstacles for completing the survey, item wording, question ordering, and overall survey design. Lastly an incentive was offered for completion of the web-based survey in both Phase A and Phase B.[83]

Finally, the web-based interface presents issues of measurement error similar to those found in telephone and mail surveys (e.g. non-differentiation, response-order effects, etc). To try to avoid these effects, a basic protocol was followed when constructing the surveys. First, the surveys were constructed so that all items appeared on a single page (excluding smart phone recipients and those in the sample with their browser view settings magnified). Furthermore, response scaling followed a similar pattern in order to increase the ease and likelihood of completion, henceforth increasing the likelihood of receiving completed surveys.

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[82] Pilot testing involved the distribution of the web-based survey to a number of students (approximately 20) in an introductory Sociology course. Students were asked to complete the survey, paying special attention to issues related to ease of completion and technical complications and compatibility.
[83] Specific information on the incentives offered are available in the Appendix.

Sampling and Distribution (Phase A and Phase B)

Procedures for sampling and distribution were the same for both Phase (A) and Phase (B) of Stage (2). Subjects in both phases were adult (18 years or older) undergraduate students enrolled at the University of Tennessee, Knoxville during the 2014 spring, semester. The sampling design was based on simple random sampling with an oversampling of current members of student environmental organizations. In each phase, the web-based survey was distributed to the students via student *volmail* accounts using the Qualtrics survey software program. Acquisition of *volmail* accounts and survey distribution differed slightly between the random sample of students, and the oversample of student-environmental organization members. The procedures for each are discussed below, beginning with the random sample.

Two random samples of email contacts were obtained from the UT registrar's office by submitting a *Student Data Report Request Form,* to the *Associate Registrar for Reporting.* A total of 200 email addresses were obtained for Phase A, and 4000 email addresses were obtained for Phase B. The samples were received from the registrar as a Microsoft excel spread sheet, and then uploaded into the Qualtrics survey software program. Distribution of the pre-test questionnaire and the full survey to the random sample involved the following procedures. First, an invitation email was sent via Qualtrix describing the research and listing the incentives for participating. This invitation email also provided a brief informed consent statement along with a web-link (see appendix). Students were instructed that by clicking on the link would open the survey and signify their informed consent to participate in the research.[84] Finally, two reminder emails were sent over the two weeks following the initial invitation email.

[84] It is important to note, that the Qualtrics software program being used keeps the original email contact information separate from the responses to the questionnaire and thus maintains anonymity. More information on risks, incentives, and informed consent are in the appendix. Completed surveys were automatically assigned a unique identifier by the Qualtrics program

In addition to the simple random samples both phases of Stage 2 involved oversampling undergraduate members of student-environmental organizations. Identification of participants and acquisition of volmail accounts for the oversampling in both stages involved contacting the leaders of several student-environmental organizations on campus (i.e. SPEAK, Project Veggie, Eco-Vols, Net Impact).[85] After initial contact was established, each leader received a description of the overall research project and a listing of the incentives and potential risks for participation. After reviewing the research materials about the research, the leaders were asked if they were willing to extend the invitation to participate to members of their organization. Leaders from three organizations agreed; SPEAK, Project V.E.G.G.I.E, and Eco-Vols.

Invitation emails that provided a brief informed consent statement and a web-link to the survey were then sent to the leaders and they in turn forwarded the invitation email to their members. Organization leaders were also asked to send a total of 15 invitation emails for the pre-testing questionnaire. For the full survey, leaders were asked to send invitation emails to all registered members, and they subsequently sent out around 350 invitations. The invitation email was identical to the one sent to the students. Students were instructed that by clicking on the link would open the survey and signify their informed consent to participate in the research. Finally, organization leaders were asked to send out two reminder emails during the over the two weeks following the initial invitation email.

Phase (A)

Design

Phase (A) began by distributing a short web-based pre-test questionnaire to a small sample of UT students (n = 23). It was designed to obtain preliminary information about the target population (UT students) in relation to the

[85] Leaders were contacted via email, or by attending an organization meeting or both.

dependent variable to be used in Phase B validity testing (Ecological Behavior). The goal of the questionnaire was to obtain a baseline understanding of the amount of variance in the number and frequency of ecological behaviors UT students engage in, (e.g. recycling or using a bicycle instead of a car). From this, a statistical power calculation could be conducted to determine an optimal sample size for significance testing. For instance, if the pretest showed that there was very little variability in student ecological behavior, sample size (in Phase B) would need to be adjusted (i.e. increased) so that small differences would register as significant (i.e. p-values). However, if the pre-test showed that there was a large amount of variability in student ecological behavior, sample size (in Phase B) would need to be adjusted (i.e. decreased), only large differences would register as significant (i.e. p-values).

Results

A pre-test questionnaire was distributed in order to assess self-reported frequency of engagement in a range of pro-ecological behaviors (see appendix). It was distributed to a sample of 215 undergraduate UT students, 15 of which were members of student-environmental organizations. The mean difference between these group in their frequency of engaging in pro-ecological behaviors was used to conduct a statistical power calculation. . A total of 23 students completed the pre-test questionnaire; 11 of the 15 student organization members (73%), and 12 of the 200 randomly sampled students (6%).

The pre-test questionnaire had 49 items; 33 were used to construct an index of pro-ecological behavior (referred to from this point on as General Ecological Behavior, or simply as GEB).[86] The first step for establishing the internal reliability of it was to perform item-analysis and tests of reliability. Internal reliability can be thought of as the consistency and stability that is present within a set of index items devoid of measurement error and error due

[86] The remaining 16 items of the questionnaire assessed demographic characteristics (12), and there were also 4 general measures of pro-ecological behavior that were not included in subsequent analyses.

subject specific variance. Cronbach's Alpha was used to assess the internal reliability of the GEB items, because it takes into account variance attributable to subjects and variance attributable to the interaction between subjects and items.[87] The result is a statistic that ranges from 0 to 1, with 0 reflecting absolute unreliability and a score of 1 reflecting perfect internal reliability. Conventionally within the social sciences, an Alpha coefficient > .7 (α = .7) is considered to be reflective of a scale with an acceptable level of internal consistency. The Cronbach's Alpha for the GEB index was .956. This suggested that there was very little item-specific variance, and that the pre-test GEB index had a very high level of inter-item reliability/consistency.[88]

The second step used to create the GEB index was to conduct a Principal Component Analysis (PCA) on the GEB items. PCA is a dimension-reduction tool used to reduce a large number of variables (e.g. survey items) to a smaller set of components that retain a maximum amount of information. The first, or ***primary component*** explains the maximum amount of variation within the variables. Conceptually the first component represents the underlying construct claimed to be measured by the items in a scale or index.[89] Standardized component scores were then calculated and operationalized as an indicator of the underlying construct of GEB.[90]

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[87] Alpha, "is useful for estimating reliability in a particular case: when item-specific variance in a unidimensional test is of interest" (Cortina, 1993, 103).

[88] Two additional aspects of interest when conducting an item-analysis are the corrected item total correlations, (i.e. the linear correlation between the particular item and the total score for all items), and the estimated α coefficient if a particular item were removed. Markedly low corrected-item total correlations (< .250) or an item shown to be pulling the α coefficient down are cause for increased investigation. In this case however, the corrected item total correlations ranged from a high of r = .883 to a low of r = .439. Moreover, there was no evidence that the removal of any single item would improve the α coefficient (see Appendix for full tables of item analysis).

[89] Any additional components produced in the analysis represent additional variance (unrelated to the primary component) covered under the domain of the construct.

[90] A primary consideration when conducting PCA is determining the proper number of components to 'extract'. PCA is an iterative procedure and will extract a total number of components equal to (1 –) the number of variables in the analysis (in this case 33). However, PCA is meant to be used as a data reduction technique so it is desirable to extract only the number of components that explain a maximal amount of variance while also making some theoretical sense. Decisions about the number of components to extract are based on eigenvalues (an estimate of the variance explained by each component), scree plots (a graphic

The PCA conducted on the pre-test GEB items was exploratory in the sense that the number of components extracted was based on the conventional wisdom that those with eigen-values greater than one (1) should be extracted. A total of seven (7) components were extracted and they explained 85% of the total variance in the items. However, the total variance explained by the first three (3) components was 67%, with the first component explaining 44%. Component loadings indicate how strongly each individual survey item is related to the respective component. Scores closer to one (1) and negative one (-1) indicate very strong relationships and scores closer to zero (0) indicate very weak relationships. Table 4.2.1 (next page) shows component loadings of the first three components extracted.[91] The figures indicate, that all of the 33 items load at least moderately strong in the positive direction on the first component (i.e. > .4), and many load very strongly (i.e. >.7). These loadings and the relatively large amount of variance explained by the first component (44%) suggest a strong degree of unidimensionality within the GEB items.

The second and third components together explain less but a sizeable proportion of variance, 23%. Furthermore, many of the items load at least moderately strong on more than just the first component. Interestingly, the items that load heavily on the second component appear to (loosely) reflect questions related to energy use (e.g. transportation, home heating, etc).[92] Similarly, the items that load heavily on the third component reflect more activist type behaviors (e.g. signing petitions, attending public meetings, etc). These results suggest that in addition to the first component, the second and third components significantly increase our understanding of the variability in GEB among the sample. Consequently, standardized component scores were calculated for the

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representation of eigenvalues), and the matrix of component loadings (correlation between the original item and each component).

[91] Individual item component loadings on the fourth through seventh components were consistently weak.

[92] The use of rotation may clarify just what is being explained in this second component, but in the interest of maintaining the independence of the components for the next step of the power analysis, rotation will not be used.

Table 4.2.1 Component Loadings of General Ecological Behavior Items

Item	Component		
	1	2	3
Q10GEB1_1	.723	-.127	.018
Q10GEB1_2	.450	.514	.106
Q10GEB1_3	.504	.188	-.279
Q10GEB1_4	.517	.413	.096
Q10GEB1_5	.489	-.500	-.236
Q10GEB1_6	.689	-.065	-.244
Q11GEB1b_7	.663	.600	.087
Q11GEB1b_8	.507	.786	.041
Q11GEB1b_9	.821	-.050	-.172
Q11GEB1b_10	.726	-.193	-.326
Q11GEB1b_11	.835	-.152	-.200
Q14GEB_4_1	.763	.287	-.324
Q14GEB_4_2	.508	.694	-.053
Q14GEB_4_3	.637	.337	-.380
Q14GEB_4_4	.418	.341	-.148
Q14GEB_4_5	.627	-.429	-.337
Q14GEB_4_6	.706	-.219	-.342
Q15GEB4b_7	.741	.439	.159
Q15GEB4b_8	.526	.749	.078
Q15GEB4b_9	.837	-.070	-.299
Q15GEB4b_10	.853	-.118	-.120
Q15GEB4b_11	.906	-.177	-.202
Q18GEB_7_1	.779	-.448	.088
Q18GEB_7_2	.612	-.391	.084
Q18GEB_7_3	.752	-.482	.198
Q18GEB_7_4	.826	-.379	.110
Q18GEB_7_5	.851	-.136	.105
XQ19GEB	.533	-.008	.499
XQ19GEB2	.432	-.378	.593
XQ19GEB3	.612	-.040	.468
XQ19GEB4	.554	.182	.523
XQ19GEB5	.519	-.236	.629
XQ19GEB6	.484	.083	.645

first three components and used in the next step of the analysis which involved assessing the degree of variation in GEB between members of student-environmental organizations and non-members.

The next step in the pre-test power analysis was to identify the differing level of engagement in ecological behaviors between members of environmental organizations and non-members. From this difference a statistical power calculation could be conducted to determine sample size for the validity testing in Phase B. This was done by comparing the standardized means for the three GEB component scores between members of environmental organizations and non-members. The results are presented Tables 4.2.2, 4.2.3, and 4.2.4, on page 143 and 144.

Standardized means on each component for each sub group (i.e. Members and Non-Members) are presented. The columns labeled standardized means indicate the standardized mean on each component for each subgroup For instance, the figures in Table 4.2.2 indicate that members and non-members differ by a full standard deviation of the overall mean on component 1 of the GEB index. Specifically, members of student-environmental organizations report engaging in GEB's at a rate of .58 standard deviations ***above the overall mean***, while non-members report a rate of .53 standard deviations ***below the overall mean***[93]. For components two and three, the difference in standardized means is approximately .58 and 1.05 standard deviations respectively[94]. These results suggest that the difference in GEB between members of student-environmental organizations and non-members ranges from around one-half to one full standard deviation of the overall sample mean. According to Cohen (1977 and 1988) a difference of this magnitude is considered a medium size effect.

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[93] Overall non-standardized mean was 99.8. The total GEB index had a maximum score of 141. Non-standardized mean for members of environmental organizations was approximately 113, and approximately 89 for non-members.

[94] The t-statistic calculated for the component one analysis was ($t = 3.163$, $p \leq .005$). For the component two analysis $t = -1.44$ ($p \leq .165$). For the component three analysis $t = .543$ ($p \leq .005$).

This information was then used in a power calculation to determine an appropriate sample size for the validity testing of the EIS scale in Phase B. The final power calculation was based on the *effect size to be detected, desired significance level, desired level of statistical power, and type of testing.*[95] The resulting sample size for correlation analyses was 28, and 26 for regression analyses.

Table 4.2.2 Standardized Mean Difference in Ecological Behaviors Component 1 (Members vs. Non-Members)

	Membership Status	N	Standardized Mean	Std. Deviation	Std. Error Mean
GEB-Comp1	Member	11	.580	.530	.159
	Non-Member	12	-.531	1.048	.302

Table 4.2.3 Standardized Mean Difference in Ecological Behaviors Component 2 (Members vs. Non-Members)

	Membership Status	N	Standardized Mean	Std. Deviation	Std. Error Mean
GEB-Comp2	Member	11	-.305[96]	.980	.295
	Non-Member	12	.280	.973	.280

[95] This was done using R, an open source (GPL) statistical environment. It was determined above that a medium effect size is what the EIS scale needs to detect. It is convention within the social sciences to conduct tests of statistical significance using p-values of .05 as the desired level, and at a level of statistical power equal to .80 (Agresti & Finlay, 1997). Finally, the primary statistical tests to be used in the initial validity testing of the EIS scale (Phase B) were correlation analyses and random effects regression. Thus, optimal sample sizes were calculated for each type of test.

[96] The counter intuitive sign on this standardized mean is a result of the fact that PCA extracts components in an orthogonal (unrelated) sequence. Consequently the second component will be negatively related to the logically assumed direction of relationships.

Table 4.2.4 Standardized Mean Difference in Ecological Behaviors Component 3 (Members vs. Non-Members)

	Membership Status	N	Standardized Mean	Std. Deviation	Std. Error Mean
GEB-3	Member	11	.580	.719	.216
	Non-Member	12	-.532	.940	.271

As mentioned earlier this pre-testing phase was designed to answer two questions. First, "How large of a statistical effect does the EIS need to detect to be substantively meaningful?" Second, "what is the optimal sample size needed to find such an effect, while also minimizing the probability of finding a false effect?" The results presented above suggest that the ideal sample sizes for the validity testing of the EIS scale are 28 for correlation analyses and 26 for regression analyses. A major portion of the analyses in Phase B involves sub-sampling with replacement from within the larger set of data (N = 497). The design and results of Phase B are discussed below.

Phase B

Design

Whereas Phase (A) involved a short web-based pre-test questionnaire distributed to a small sample of UT students, Phase (B) involved a longer web-based survey distributed to a much larger sample of UT students (n = 4350). The primary purpose of Phase B was to conduct formal validity and reliability testing on the EIS scale. Given that the procedures for sampling and distribution of the full survey were covered in a prior section, the next step in discussing the Phase B survey design is to detail the particular items included in the survey. The survey contained a total of 105 questions, and in addition to the EIS scale it covered a range of social psychological constructs frequently used within this

literature such as (e.g. attitudes, norms, worldview, etc.). Thirty one items were derived from the focus groups to constitute the EIS scale. Respondents were asked to indicate their level of agreement with statements designed to tap into the extent to which they see themselves as part of an integrated social and biophysical (i.e. ecological) system characterized by interconnected processes and relationships. Responses to the EIS items were scored on a five (5) point Likert scale ranging from “strongly agree” to “strongly disagree”. In addition to the EIS items, 14 items were derived from the focus groups to constitute an index of General Ecological Behavior. Respondents were asked to indicate the relative frequency they engaged in a number of pro-ecological behaviors when they have the opportunity to. Responses were scored on a five (5) point Likert scale ranging from “rarely” to “almost always”. Ten items were derived from the focus groups to constitute a scale of environmental concern. Respondents were asked to indicate their level of concern for each of the items and responses were arranged in a five (5) point Likert format ranging from “not at all concerned” to “extremely concerned”. The 15 item New Ecological Paradigm scale (Dunlap et al., 2000) was used to assess ecological worldview. Respondents were asked to indicate their level of agreement with statements designed to tap basic beliefs about the relationship between humans and nature. Responses were arranged in a five (5) point Likert format ranging from “strongly agree” to “strongly disagree”. Thirteen items from Schwartz’s (1992) Universal values survey were used to assess social values. Eight were used to assess self-transcendent values, and five were used to assess values related to power. Respondents were asked to rate the importance of these thirteen value statements as guiding principles in their lives. Responses were arranged into five categories ranging from “opposed to my values” to “Extremely Important”. Six items were designed tap into respondents’ attitudes toward pro-ecological behaviors and people who engage in pro-ecological behaviors. Responses to these attitude items were arranged in a five (5) point Likert format as well. Finally, two items were used to assess pro-ecological norms and measured the extent respondents felt

pressured to engage in pro-ecological behaviors. Finally, one item asked respondents to indicate whether they were a member of a student-environmental organization, and another was used to indicate whether they had ever taken a course that examines natural resource, wildlife, or environmental issues.[97]

Results

The results of Phase (B) are organized into three sections each providing evidence to support the validity and reliability of the EIS scale. Section (1) describes the overall response to the survey and provides some descriptive findings that demonstrate strong and convincing support for the validity of the EIS scale. The second section presents a focused analysis of the particular items contained in the EIS scale. In this section, item-analysis and Principal Component Analysis were used to demonstrate evidence for the reliability and construct validity of the EIS scale. Section (3) presents results from item-analysis and PCA procedures conducted on the other scales and contained in the survey that were used in validity testing (i.e. GEB, NEP, values, environmental concern, and pro-ecological attitudes and norms). Finally the third section presents the results from two sets of statistical analyses examining for potential relationships between Ecological Identity and other constructs.

Descriptive Findings

As is indicated in Table 4.2.5, of the 4350 surveys sent via email to UT students a total of 512 were returned. However 14 of them were returned by ineligible respondents and one person opened the survey but did not make any responses to it.[98] Thus, 497 of the 512 (97%) surveys were completed by the target population of UT undergraduate students. This equates to an overall

[97] The remaining 12 items included mostly demographic questions, and four general measures of ecological behavior that were not included in subsequent analyses.

[98] Fourteen surveys were returned by graduate students who were not eligible to participate. A screening question asking the respondent whether they were an "graduate" or "undergraduate" students redirected those who indicated "graduate" to a web page thanking them for their interest and time, but indicating that the survey was intended for undergraduates only

response rate of 11.5 (497/4350). Of the 497 eligible respondents, 427 (86%) students who were not members of environmental organizations, and 70 (14%) students who indicated they were members in a student-environmental organization. The survey was launched on Tuesday, April 22 and was closed on May 10.

Table 4.2.5 Survey Response

Total surveys Sent	**N = 4350**
Total Returned	N = 512 (12%)
Eligible Respondents	N = 497 (97%)
Overall Response Rate	11.5%
Student Environmental Organization Members	N = 70 (14%)
Non-Members	N = 427 (85%)

Table 4.2.6 (following page) presents descriptive statistics for each of the scales included in the survey. Information contained in this table can help us learn about the sample and make a case for the face validity of the EIS scale.[99] It was hypothesized in Chapter 3 that members of student-environmental organizations would have a stronger Ecological Identity than non-members (Hypothesis 6). The figures presented in Table 4.2.6 offer initial support for this hypothesis. Indeed, the mean score on the EIS scale for organization members is 104.7 while it is 85 for non-members. This equates to members of environmental organizations averaged 3.4 on each item, while non-members averaged 2.7. A score of three on these items was a neutral score, while above a three equated to a stronger ecological identity, and below a three equated to a weaker ecological identity.

[99]It is important to note that each of the scales as they are presented in this table are cumulative scales, meaning the individual item scores have been summed in order to attain a total value for each respondent Later in the analysis statistical testing will be done with these scales, but the scale values will be comprised of standardized principle component scores.

Table 4.2.6 Descriptive Statistics of Survey Scales

Scale	Overall Mean	Mean Org. Member	Mean Non-Member	SD	Range	Items
GEB	39.1	50.3	37.2	11.4	14-70	14
EIS	87.9	104.7	85.2	15.6	31-155	31
NEP	53.6	59.5	52.6	8.9	15-75	15
Env. Concern	35.6	43.3	34.3	8.7	10-50	10
Env. Attitude	24.9	27.3	24.6	3.4	6-30	6
Env. Norm	6.2	6.7	6.1	1.9	2-10	2
Values-Self-Trans	31.8	35.1	31.2	5.1	8-40	8
Values-Power	14.4	13.8	14.5	3.2	5-20	5
Valid N (listwise) 443						

***On Environmental Variables, Higher Means = Greater Environmentalism**

The results are similar for the other scales in the survey. Specifically, difference in mean scores between the groups on all the scales in the study are noticeable and in the expected directions. For instance, mean score on the NEP for organization members is 59.5 while for non-members it is 52.6. Each of the NEP items was also based on a five-point Likert scoring scale, thus members of environmental organizations averaged near a 4 on each NEP item, while non-members averaged 3.5. Mean score of the GEB index for organization members is 50.3 while for non-members it is 37.2, thus members of environmental organizations averaged a 3.6 on each of the 14 GEB items while non-members averaged a 2.7 on each item. Conceptually this translates into organization members reporting that they *frequently to usually* engaged in the behaviors covered by the GEB index, and non-members reporting that they *sometimes to frequently* engage in these behaviors.

In Chapter 3, it was hypothesized that those who have rank higher on the EIS scale would also rank higher on each of the scales except for the scale of values related to power. With this variable the EIS scale was assumed to have a negative relationship. Importantly, the difference in mean EIS score between the

two subgroups is concurrent with the differences found for the scales that EIS was hypothesized to be positively related to (GEB, NEP, environmental concern, Universal-values, pro-ecological attitudes and norms). Furthermore, the difference in mean EIS score is divergent from the differences found for the scale it was hypothesized to not be related to (Power-values). This offers initial support for each of the hypotheses in Chapter 3, and consequently the construct validity of the EIS scale.

Table 4.2.7 (following page) offers a closer look at the descriptive statistics for each of the EIS items (A full list of survey items can be found in the appendix). The table reports the means, standard deviations, and standardized mean difference between members and non-members for each EIS item. Across 29 of the 31 items (94%), mean differences are in the expected direction and range from a low of .2 to a high of 1.32. (i.e., members of environmental groups score higher). Interestingly the standardized mean difference for two particular items (#12 and #13) is in the opposite direction.[100] This is certainly cause for concern and the behavior of these items will be tracked during this next section of the analysis. Outside of these two items however the standard deviation differences between groups are all in the expected direction. These consistent differences across the EIS scale items between groups offer initial support for hypothesis six and the overall construct validity of the EIS scale.

SECTION (2): ITEM ANALYSIS AND SCALE/ INDEX CONSTRUCTION

Moving from the descriptive results of Section 1 to a more in depth assessment of the EIS scale, the next section will demonstrate the extent to which the EIS items measure a unidimensional construct and are internally consistent and interrelated. It provides evidence for the reliability and construct

[100] These are both items designed to tap the differentiation dimension. EIS(9) & EIS (10) are worded as follows: "We are separated from nature because of the way we live" & and "We are separated from nature because of our knowledge, technology, and organization".

Table 4.2.7 Means for EIS Items and Standardized Mean Difference by Membership Status

EIS Item	EI Dimension	Mean (Standard Deviation) Range = 1 – 5		Standardize Mean Difference
		Member*	Non-Member	
EIS 1	Sameness	4.7 (.52)	4.1 (.73)	.80
EIS 2	Sameness	4.3 (.87)	3.6 (.99)	.69
EIS 3	Sameness	4.2 (.77)	3.4 (1.0)	.79
EIS 4	Sameness	3.9 (1.1)	2.6 (1.1)	1.10
EIS 5	Sameness	4.0 (.90)	2.7 (1.1)	1.10
EIS 6	Sameness	4.5 (.77)	3.6 (1.1)	.87
EIS 7	Sameness	4.5 (.73)	4.2 (.88)	.35
EIS 8	Sameness	4.8 (.59)	4.4 (.82)	.50
EIS 9	Sameness	4.2 (.80)	3.2 (1.0)	.96
EIS 10	Sameness	4.2 (.86)	3.3 (.97)	.90
EIS 11	Differentiation	4.5 (.97)	4.3 (.99)	.20
EIS 12	Differentiation	4.2 (1.0)	4.5 (.70)	(-).40
EIS 13	Differentiation	3.3 (1.4)	3.4 (1.2)	(-).08
EIS 14	Differentiation	4.3 (1.0)	3.6 (1.1)	.62
EIS 15	Differentiation	4.5 (.79)	4.0 (1.0)	.49
EIS 16	Differentiation	4.6 (.65)	4.1 (.95)	.54
EIS 17	Differentiation	4.5 (.85)	3.7 (1.2)	.70
EIS 18	Differentiation	4.3 (.98)	3.7 (1.2)	.50
EIS 19	Differentiation	3.6 (1.4)	3.1 (1.3)	.37
EIS 20	Differentiation	3.8 (1.0)	3.1 (1.1)	.65
EIS 21	Differentiation	4.2 (.90)	3.6 (1.1)	.57
EIS 22	Differentiation	3.2 (1.2)	2.6 (.97)	.59
EIS 23	Differentiation	3.0 (1.2)	2.6 (.98)	.39
EIS 24	Centrality	4.1 (.90)	3.3 (1.0)	.73
EIS 25	Centrality	4.3 (.90)	3.6 (1.0)	.67
EIS 26	Centrality	4.1 (1.2)	3.5 (1.1)	.52
EIS 27	Centrality	3.8 (.87)	2.9 (1.1)	.83
EIS 28	Centrality	3.8 (.80)	2.6 (.80)	1.32
EIS 29	Centrality	4.1 (.80)	3.3 (.90)	.85
EIS 30	Centrality	4.1 (.92)	3.1 (.95)	1.00
EIS 31	Centrality	4.2 (.74)	3.5 (.86)	.78

1 Members = 68 based on listwise deletion

2 Non-Members = 415 based on listwise deletion

validity of the EIS.[101] The first step in this process was to check the internal consistency of the 31 EIS items by conducting tests of reliability via item analysis. The second step was to conduct a principal component analysis on the 31 EIS items in order to test their construct validity.[102]

To test the reliability and internal consistency of the 31 EIS items an item-analysis was conducted. Recall that internal reliability can be thought of as the consistency and stability that is present within a set of scale items devoid of measurement error (Vogt, 1999). The Cronbach's Alpha for the 31 EIS items was .896. This provides very strong support for the internal reliability of the EIS scale. That being said, in addition to the alpha score, there are two additional aspects of interest when conducting an item-analysis; the corrected item-total correlations, and the estimated Alpha α coefficient if an item were removed. [103] Two items, (#12 and #13), have very low inter-item correlations and one is negative (#12 = .110; #13 = -.082). Furthermore, the analysis suggests that item number 12 is in fact dragging the Alpha coefficient down And so, in addition to the problems identified with these items in the descriptive findings, they also exhibit a lack of internal consistency with the other EIS items. For these reasons, they were removed and a second Cronbach's Alpha was calculated using the remaining 29 EIS items, and this produced an Alpha coefficient of .91

The second step was to conduct a principle components analysis on the 29 remaining EIS items. This initial PCA was exploratory in the sense that the number of components extracted was determined by the conventional wisdom that components with eigen-values greater than one (1) should be extracted. A total of seven (7) components were extracted and they explained 65.5% of the

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[101] One of the most basic elements of construct validity is the assumption that on some level the items that make up a scale represent some unifying construct. Regardless of the dimensionality discussed in chapter 3, the framework of Ecological Identity is assumed to be unidimensional on a fundamental level.
[102] Construct validity refers in part to the extent a construct has been validly operationalized. That is, do the items really get at what is trying to be measured? On a multi-item scale for instance, this refers to how well one can one generalize that the scores on individual items truly reflect the underlying construct? Principal Component Analysis is one common means of assessing the construct validity of a scale
[103] The linear correlation between the particular item and the total score for all items.

total variance in the items. However, the total variance explained by the first four (4) components was 53%, with the first component explaining 28.8%.
Recall from earlier that component loadings indicate how strongly each individual item is related to the respective component. Scores closer to one (1) and negative one (-1) indicate very strong relationships and scores closer to zero (0) indicate very weak relationships. Table 4.2.8 (page 153) shows component loadings for the first four of seven components extracted.[104] The figures indicate that many of the 29 items load at least moderately strong in the positive direction on the first component and those that don't, load well on the second or fourth components. Although these component loadings and the relatively large amount of variance explained by the first component suggest a strong degree of unidimensionality within the EIS items, there are three items that appear particular problematic. Items number 11, 22, and 23 do not load very heavily on any one component. For this reason, a second PCA was conducted without these items to see if their removal would be warranted

In this second PCA using 26 of the EIS items, a total of six (6) components were extracted and they explained 68% of the variance in the items. However, the first four components explained 88% of the 68%. Although most items loaded at least moderately on the first component, two items in particular did not load well on any of the components (#7 and #8). However, there were only moderate increases in the amount of item variance explained from the first PCA to the second, (i.e. from 53% in the first PCA to 60% in the second). Moreover, the problem items in the first PCA, (#11, #22, and #23), had acceptable individual KMO scores. Consequently the decision was made to keep 29 EIS items. This seemed appropriate especially since the EIS scale is in development, and by keeping these addition items, the variance explained by them would be included in the validity testing in Section 3. Thus, standardized

[104] Individual item component loadings on the fourth through seventh components were consistently weak.

component scores were calculated for the first four components extracted from the 29 EIS items and would be used in the validity testing in Stage (3).[105]

The overall results of the procedures followed above offer strong support for the internal reliability and construct validity of the EIS. For example Section 1 presented descriptive findings within the student survey (N = 497) that demonstrated face validity and initial support for the hypotheses in Chapter 3. The Second section then offered a more detailed analysis of the EIS scale by conducting a series of reliability tests, item-analyses, and principal component analyses. The EIS items were shown to inter-correlate consistently, and a small number of principle components were shown to explain 53% of the variance in the items. The reliability of the items was very high, (α = .91), and these are clear indications that the items are measuring some underlying construct. That being said, "validity is a matter of degree rather than an all-or-none property, and validation is an unending process" (Nunnally, 67, 75). The next step will be to further test and demonstrate the scale's validity and reliability by assessing the relationships between the EIS and measures of other related constructs.

Section (3): Validity Testing

This section of the Stage (2) Phase (B) results first provides summary information for the principle component and item-analysis procedures used to construct the following measures: the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000), an index of General Ecological Behavior (GEB), two scales measuring Universalist and Power Values (Schwartz, 1992), a scale of General Environmental Concern (GEC), and two scales measuring pro-ecological attitudes (EA) and pro-ecological norms (EN).

[105] Many of the problematic items in these PCAs were items designed to assess the social level of analysis. Consequently, a Cronbach's Alpha reliability test was conducted on these items alone. The Alpha for these five items was very low (α=.33).

Table 4.2.8 EIS Component Loadings (29 Items)

Item	Component			
	1	2	3	4
EIS 1	.666	-.216	.077	.173
EIS 2	.645	-.410	-.048	.130
EIS 3	.610	-.432	.050	.073
EIS 4	.642	-.459	.330	-.142
EIS 5	.665	-.440	.310	-.088
EIS 6	.698	-.220	.264	-.022
EIS 7	.295	.074	.191	.439
EIS 8	.272	.076	.057	.588
EIS 9	.214	.104	.147	.218
EIS 10	.689	-.261	.294	.095
EIS 11	.654	-.305	.313	.101
EIS 14	.362	.475	-.258	.126
EIS 15	.522	.565	-.204	.201
EIS 16	.563	.498	-.211	.213
EIS 17	.502	.529	.157	.116
EIS 18	.509	.533	.165	.154
EIS 19	.392	.396	.446	-.125
EIS 20	.458	.493	.254	-.297
EIS 21	.490	.523	.111	-.203
EIS 22	.300	.276	-.030	-.297
EIS 23	.329	.368	.272	-.249
EIS 24	.511	-.018	-.128	-.306
EIS 25	.597	-.006	-.214	-.350
EIS 26	.513	-.062	-.238	-.380
EIS 27	.620	-.105	-.156	-.049
EIS 28	.624	-.223	-.164	.034
EIS 29	.499	-.172	-.612	-.002
EIS 30	.632	-.086	-.414	.064
EIS 31	.592	-.017	-.597	.055

Extraction Method: Principal Component Analysis.

a. 4 components extracted.

Next, two sets of statistical analyses are presented that further build the case for the validity and reliability of the EIS. In both, the results from the pre-test questionnaire power analysis were used as guides to randomly draw subsamples (n = 26 for regression analysis and n = 28 for correlation analysis) from within the larger survey sample (n = 497). Recall that these smaller sample sizes are appropriate for the given effect the EIS scale needs to be able to detect. Furthermore, the use of these smaller sample sizes will minimize the probability of finding statistically significant results that are not substantively meaningful. Finally, by conducting multiple independent statistical tests of the EIS scale, results can be compared across subsamples building the case for the EIS's cross-sample validity and reliability.[106] The first set of analyses further builds the case for the EIS's construct validity by demonstrating its convergent and discriminant properties. This is done through a series of correlation analyses assessing the relationship between the EIS scale and the other scales listed in Table 4.2.9 (next page). The second set of analyses was aimed at demonstrating the predictive validity of the EIS scale, and providing evidence for its reliability and validity across multiple samples. This is done through running a series of random effect linear models in which the performance of the EIS is directly compared and contrasted with the well established NEP scale. Comparison of the models will be based on AIC scores.[107]

The following measures were constructed from the full survey and used in validity testing: the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000), an index of General Ecological Behavior (GEB), two scales measuring Universalist and Power Values (Scwhartz, 1992), a scale of General Environmental Concern (GEC), and two scales measuring pro-ecological attitudes (EA) and pro-ecological norms (EN). All of the items for the seven

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[106] Furthermore, by keeping the tests independent the need for need for Bonferroni corrections to the p-values can be avoided.

[107] Recall that the AIC gives an assessment of the distance between a fitted model and the data being analyzed. The less distance between the two, the closer the fitted model is to the actual data (the lower the AIC the better). Furthermore, unlike p-values, AIC scores can be directly compared across models.

Table 4.2.9 Construction of Survey Scales for Validity Testing

Scale	Components Extracted	Total Variance Explained	Items	Alpha (α)
EIS	4	53.1%	29	.91
GEB	3	65.8%	14	.91
NEP	3	48%	15	.83
GEC	1	56%	10	.91
Env. Attitude	1	63.5%	6	.88
Env. Norm	1	86%	2	.84
Values-Self-Trans	1	48%	8	.85
Values-Power	1	47.2%	5	.72
N = 443 based on listwise deletion				

scales were subjected to item-analysis reliability testing and principle components analysis. As can be seen in the Table above all scales appear to have high levels of internal reliability. Furthermore, for all scales the components extracted explain nearly half or more of their item variance. Given these results, component scores were calculated for each of the scales and were used in the validity tests the EIS scale by assessing the relationships that exist between them.

The first set of validity tests in this final section will be used to demonstrate the convergent and discriminant validity of the EIS scale. Both convergent and discriminant validity are facets of the broader category of construct validity. Convergent validity can be shown by demonstrating that a scale is positively correlated to a measure that it should in theory be. A high level of construct validity also entails demonstrating that a certain scale can be discriminated from measures of similar constructs. That is, to demonstrate discriminant validity, a

scale must be shown to explain something unique.[108] To demonstrate convergent and discriminant validity, the component scores from the scales presented in Table 4.2.9 were entered into a series of correlation matrices.

In the case of convergent validity it was assumed that the EIS scale would be positively related to the following constructs: GEB, NEP, General Environmental Concern (GEC), Universal Values, pro-ecological attitudes, and pro-ecological norms. Alternatively, the EIS should be negatively related to the scale of values related to power. Convergent validity will be demonstrated if the **first component scores** from the EIS scale relate in predictable ways with the first component scores of the other constructs.[109] Tables 4.2.10 through 4.2.13 (subsequent pages) present correlations between the first component scores of the EIS scale and those of the other seven constructs using four independent subsamples of 28 respondents. As can be seen in subsamples A and B (Tables 4.2.10 and 4.2.11), the EIS scale correlates strongly and at a high level of significance with: the New Ecological Paradigm Scale are strong, and highly significant (r = .71; r = .81); the General Ecological Behavior Index (r = .55; r = .74) and the General Environmental Concern Scale (r = .61; r = .73). Similarly, in subsamples C and D (Tables 4.2.11 and 4.2.12), the EIS scale positively and significantly correlates with pro-ecological attitudes (r = .53; r = .57) and Universalist Values (r = .49; r = .43). Of note, is that the correlations between the EIS scale and the scale of Power Values and pro-ecological norms do not reach statistical significance. Still, the direction of the relationship in both instances is as expected. Overall these results demonstrate convincing evidence of the convergent validity of the EIS scale.

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[108] Although it is commonly misunderstood and discriminate validity is frequently thought to mean the ability of a scale to discriminate between two groups (cf discriminant function analysis). This is in fact a way to show discriminant validity, but it does not define the concept.

[109] First component scores are conceptually understood to represent the primary theoretical construct measured by a scale.

Table 4.2.10 Tests of Convergent Validity: Correlation between First Components Sub Sample A

		EIS-1	NEP-1	GEB-1
NEP-1	Pearson Correlation	.707**		
GEB-1	Pearson Correlation	.545**	.226	
GEC-1	Pearson Correlation	.607**	.655**	.201
	N	27	27	28

**. Correlation is significant at the 0.01 level (1-tailed).

Table 4.2.11 Tests of Convergent Validity: Correlation between First Components: Sub Sample B

		EIS-1	GEB-1	NEP-1
GEB-1	Pearson Correlation	.740**		
NEP-1	Pearson Correlation	.80**	.505**	
GEC-1	Pearson Correlation	.727**	.563**	.499**
	N	28	28	28

**. Correlation is significant at the 0.01 level (1-tailed).

The next set of analyses was used to test the discriminant validity of the EIS scale. An effective way to test this is to look at the relationships between the primary or first component scores of EIS scale and the secondary components of the other constructs. The secondary components represent additional variance explained by other scales that is not represented in their first component. Henceforth, any overlap between the first EIS component and secondary components of other measure would suggest that the EIS items were assessing variance already explained within these other scales. On the other hand if no

significant relationships are found, it would suggest that the EIS scale is explaining some unique underlying construct not assessed by the others.

Table 4.2.12 Tests of Convergent Validity: Correlations between First Components: Sub Sample C

		EIS-1	Eco Att-1	Values Self-Trans-1	Power Values-1
Eco Att-1	Pearson Correlation	.533**			
Values Self-Trans-1	Pearson Correlation	.489**	.475*		
Power Values-1	Pearson Correlation	-.231	-.039	.236	
Eco Norm-1	Pearson Correlation	.099	-.061	-.187	.078
	N	27	28	28	28

**Correlation is significant at the 0.01 level (1-tailed)
* Correlation is significant at the .05 level (1-tailed)

Table 4.2.13 Tests of Convergent Validity: Correlations between First Components: Sub Sample D

		EIS-1	Eco Att-1	Values Self-Trans-1	Power Values-1
Eco Att-1	Pearson Correlation	.569**			
Values Self-Trans-1	Pearson Correlation	.434**	.552**		
Power Values-1	Pearson Correlation	-.317	-.019	.072	
Eco Norm-1	Pearson Correlation	.359	.372	.131	-.019
	N	25	27	27	27

**. Correlation is significant at the 0.01 level (1-tailed).

Two new subsamples were drawn for this analysis and the results are presented below in Tables 4.2.14 and 4.2.15. For both tests EIS-1 was **uncorrelated** with the second and third components of NEP (NEP-2, and NEP-3), and the second component of the Universal Values scale (Values-Self-Trans-2). Indeed, there are no statistically significant relationships found. This finding provides support for the discriminant validity of the EIS scale, and suggests that the Ecological Identity is distinct from these other constructs.

Table 4.2.14 Tests of Discriminant Validity: Correlation between EIS First Component and Secondary Components for Others: Subsample E

		EIS-1	NEP-2	NEP-3
NEP-2	Pearson Correlation	.066		
NEP-3	Pearson Correlation	-.065	-.281	
Values Self-Trans-2	Pearson Correlation	-.235	-.255	.105
	N	26	26	26

Table 4.2.15 Discriminant Validity: Correlations between Primary EIS and Secondary Others: Sub Sample F

		EIS-1	NEP-2	NEP-3
NEP-2	Pearson Correlation	-.280		
NEP-3	Pearson Correlation	-.231	.067	
Values Self-Trans-2	Pearson Correlation	-.139	-.079	-.254
	N	24	25	25

The final set of validity tests in Stage (2) was aimed at demonstrating the predictive validity of the EIS scale, and providing evidence for its reliability and validity across multiple samples. This was done by running a series of random

effect linear regression models in which the performance of the EIS scale was directly compared and contrasted with the NEP scale.[110] A random-effect linear model was chosen for this analysis because of the likely existence of several sampling design effects that constitute unobserved (i.e., random) variables. Unobserved or random variables can be thought of as structural effects related to sampling that violate the assumptions of normal probability theory and henceforth affect the accuracy results. For instance, because this study did not randomly sample within the population of student-environmental organization members, we cannot assume normal probability theory will apply. What a random-effects model does in this situation, is partition the error term so that variance associated with the random effect is controlled. This allows for a more precise understanding of how the fixed effects (i.e., EIS and NEP) operate across these sampling categories. Three random effects will be controlled for; membership in a student environmental organization, whether the respondent has taken a course related to environmental and resource issues, and the date the respondent completed the survey.

Within this random effects design, a series of 20 bivariate regressions was conducted. Ten of the models regressed the EIS scale on the GEB index, while the other ten models regressed the NEP scale on the GEB index. The models were then compared using two criteria. The first criterion was whether either of the predictor variables (EIS or NEP) could predict GEB with a high degree of statistical significance ($p \leq .05$). The second criterion was the difference in AIC scores between the NEP models and the EIS models. Recall that the AIC gives an estimate model fit and can be used for direct statistical comparison across models. Models that produce lower AIC are evaluated as better performing models.

The predictive validity of the EIS scale will be demonstrated if it can consistently predict GEB at a high level of statistical significance ($p \leq .05$).

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[110] The NEP was chosen for this test because of its well established reliability and validity.

Furthermore if the EIS models consistently perform better than the NEP models, (as judged by AIC scores), it will further support the construct validity of Ecological Identity by demonstrating its unique contribution to pro-ecological behavior. Finally, if consistent effects of EIS on GEB are found across multiple subsamples, it provides support for its cross-sample validity and reliability. The results of the random-effect regressions are presented in Table 4.2.16 (following page). As the data indicate, significant effects were found in all ten models where EIS was regressed on GEB. However, significant effects were found in only five of the NEP models. Moreover, the EIS appears to consistently outperform NEP in terms of AIC scores, with a mean AIC difference across the models of -14.1. Thus, the EIS scale consistently explains more about GEB than does the NEP. These results further support the validity and reliability of the EIS scale and the underlying construct of Ecological Identity.

Stage (3) Exploratory Models of Ecological Behavior

Overview

Recall the discussion at the beginning of Stage (2) about information-theoretic approaches to model selection. Instead of attempting to explain the most variance possible, an information-theoretic perspective assumes statistical models are mere approximations of reality, and the goal is to test multiple models to select the ones that ***best approximate the data in the most parsimonious way***. Stage (3) involved systematic statistical testing of a series of exploratory models of ecological behavior that integrated EI with other more established theoretical constructs. Through the testing and comparison of multiple models, three of varying levels of complexity were identified as ***best approximating models***. [111]

[111] Around two dozen models were tested.

Table 4.2.16 Predictive Validity Testing and Model Comparison of EIS vs. NEP Using Random Effects Regression to Model Pro-ecological Behavior across 20 Subsamples

	EIS	NEP	AIC Difference
Subsample 1,2	B = .489 t = 3.91*** AIC = 46.6	B = .269 t = 1.58 AIC = 76.8	-30.2
Subsample 3,4	B = .164 t = 6.15*** AIC = 54.2	B = -.176 t = -1.4 AIC = 55.7	-1.5
Subsample 5,6	B = .387 t = 2.84** AIC = 61.0	B = .176 t = .96 AIC = 80.2	-19.2
Subsample 7,8	B = .686 t = 6.29*** AIC = 57.6	B = .644 t = 3.84*** AIC = 78.4	-20.8
Subsample 9,10	B = .450 t = 3.37** AIC = 60.5	B = .327 t = 1.36 AIC = 78.0	-17.5
Subsample 11,12	B = .511 t = 3.24** AIC = 65.7	B = .135 t = .674 AIC = 74.5	-8.8
Subsample 13,14	B = .502 t = 3.50*** AIC = 59.3	B = .091 t = .56 AIC = 75.7	-16.4
Subsample 15,16	B = .845 t = 4.90*** AIC = 61.1	B = .549 t = 2.30** AIC = 72.7	-11.6
Subsample 17,18	B = .719 t = 5.50*** AIC = 57.5	B = .190 t = 1.06 AIC = 81.6	-24.1
Subsample 19,20	B = .756 t = 3.30** AIC = 65.3	B = 4.79 t = 3.76*** AIC = 57.8	+7.5
Mean AIC	AIC = 58.88	AIC = 73.14	-14.3

N = 26 for all subsamples; **p<.05, ***p<.001

Information theoretic approaches rely heavily for model comparison on the AIC statistic. The AIC gives an assessment of the distance between a fitted model and the data being analyzed. The less distance between the two, the closer the fitted model is to the actual data (i.e., the lower the AIC the better). Importantly, the principal of parsimony is reflected in a model's AIC, because the score accounts for the tradeoff between model accuracy and the number of parameters in the model. Thus, through comparing AIC scores across models, we can determine the model with, "…the smallest number of parameters for adequate representation of the data" (Box and Jenkins, 1970, 17). Similar to the other stages in this analysis, Stage (3) also involves two phases.

Phase A

The goal of Phase (A) was to determine whether the sampling effects between subgroups (i.e. student environmental organization members and non-members) were sufficient to warrant modeling them as random effects during multi-model testing. This was important to determine, because strong random effects can distort parameter estimates and AIC scores.

To do so, a series of six structural equation path models were tested using the optimal sample size (n = 29) determine in the Stage (2) pre-test power analysis. Three of the models were run on subsamples containing UT students that were members of environmental organizations, and three identical models were run on subsamples containing UT students that were not members of environmental organizations. After the models were run, AIC scores between the subgroup models were compared. If large differences were found (e.g. 40), it would suggest the grouping effect was strong. If so, all models used in comparison would need to be hierarchically estimated.[112] This would ensure that the grouping effects would not render parameter estimates inaccurate.

[112] To establish what constituted a "significant" difference in AIC score between the models, a bootstrapping technique was employed to estimate the AIC sampling distribution and calculate confidence intervals.

Three classes of models were run reflecting different levels of complexity; **direct, intervening, and complete**. The complete model was based on the exploratory model presented in Chapter 3 and appears on the following page (Figure 4.3). The **complete model** assumes that engagement in pro-ecological behaviors (e.g. minimizing energy use, purchasing environmentally friendly products, etc.) is driven in part by a hierarchical set of social psychological constructs. As the diagram shows, these social psychological constructs range in terms of their *proximity* to behavior. The closer in proximity a construct is to a behavior (e.g., Environmental Concern), the stronger and more direct its influence is hypothesized to be. The more *distal* a construct is to a behavior (e.g., Values), the more indirect its influence is hypothesized to be. That is, the influence of these distal constructs, operate through intervening construct (e.g., Ecological Identity).

The arrows in the diagram indicate assumed directions of causality. Thus, Values and Worldviews are assumed to influence the likelihood that someone internalizes a strong Ecological Identity. In turn, if someone internalizes a strong Ecological Identity it will influence their level of concern about the environment, attitudes toward environmentalists and pro-ecological behavior, and the degree they feel social pressure to conform to pro-ecological norms. These more proximal effects then influence behavior directly. Ecological identity is assumed to lie directly between highly abstract constructs (i.e. Values and Worldviews) and much more concrete constructs (i.e., Environmental Concern, Attitudes, and Norms).

The other two classes of models that were tested are less complex. The **direct model** for instance incorporated the three most proximal variables to General Ecological Behavior (i.e., Environmental Concern, Attitudes, and Norms). The **intervening model** on the other hand, incorporated four predictor variables; the most proximal variables from the direct model and Ecological Identity as a more distal variable. As can be seen in Table 4.3.1 (page 166), AIC scores for identical models between subgroup samples were not sufficiently

different, and suggested no evidence that random sampling effects needed to be considered. Consequently, in the next phase of multi-model testing and comparison, the groups can be combined into a single sample and estimated using standard maximum likelihood estimator.

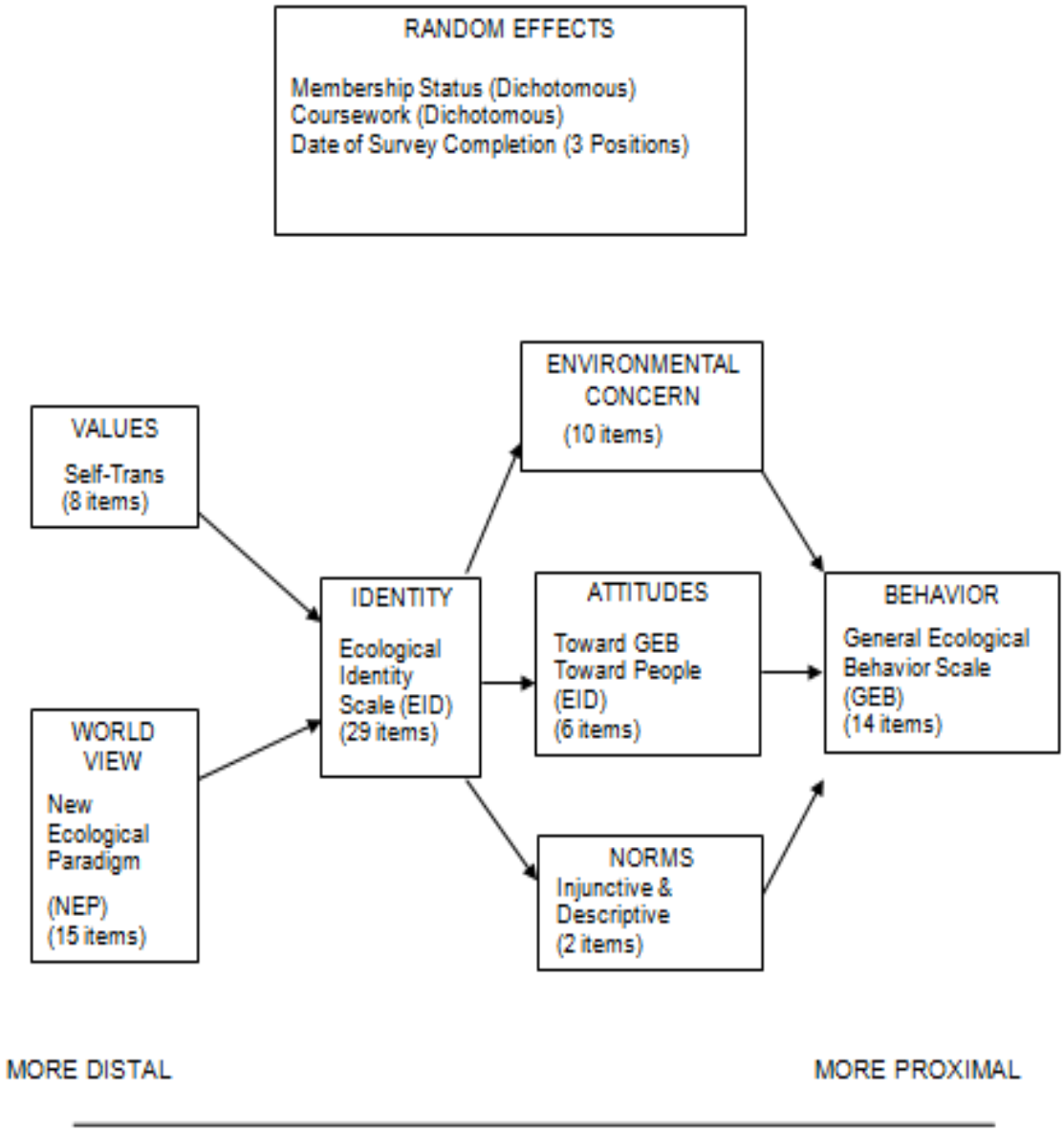

Figure 4.3 Complete Model

Table 4.3.1 Random Effects Testing

	Members	*Non-Members*
Complete Model	*AIC = 71*	*AIC = 62*
Intervening Model	*AIC = 37*	*AIC = 24*
Direct Model	*AIC = 8*	*AIC = 8*

Phase B

Given that there was not substantial evidence of random sampling effects found above, the models in Phase (B) were run with samples that combined both members of student environmental organizations and non-members into a single sample. Furthermore, the results of the Stage (2) validity testing confirmed that substantively meaningful relationship between the EIS scale and other variables in the analysis do exist (i.e. small sample testing). Having established this, the final set of models was run using the full sample (n = 497).

The overarching goal of Phase (B) is to gain information (via AIC) about the relative performance of multiple models. Recall that models with lower AIC scores are in effect explaining the most about the data in the most efficient way. As with Phase (A), three classes of models were tested; **direct, intervening, and complete.** The complete models were tested first, and then smaller candidate models were tested to see if they improved upon the complete models. Inference is not the goal in this exploratory modeling process; instead, it is model comparison. Results are presented in figures 4.4, 4.5, 4.6, and 4.7, on subsequent pages.

In Phase (B) two **complete models** were tested. The first was the complete model tested above (complete hierarchical model), and the second used all of the same variables, but modeled the relationships in reverse causal order (complete behavioral model). By comparing the AIC scores between these two models, we can get a sense of whether it is more appropriate to model social psychological factors as drivers of behavior or whether they instead result from behavior. Results are depicted in Figures 4.4 and 4.5 (next 2 pages).

As the figures indicate, the AIC score for the complete hierarchical model is 292.01. Paths coefficients are standardized and can thus be compared. Several of the path coefficients are large. In particular, the paths leading from Ecological Identity to Environmental Concern (.70) and Environmental Attitudes (.60). Surprisingly, the path between Environmental Attitudes and GEB is low (.12), while the path between Environmental Concern and GEB is high (.52). Environmental Norms don't appear to be adding much to the model at all as witnessed by the low path coefficients in both directions. Overall, with the exception of Environmental Norms, the coefficients suggest that the complete hierarchical model effectively models behavior. By contrast, the complete behavioral model produces a substantially higher AIC score of 407.46. This offers strong support for modeling social psychological constructs as drivers of pro-ecological behavior rather than the reverse. But how does the complete hierarchical model compare to smaller intervening models?

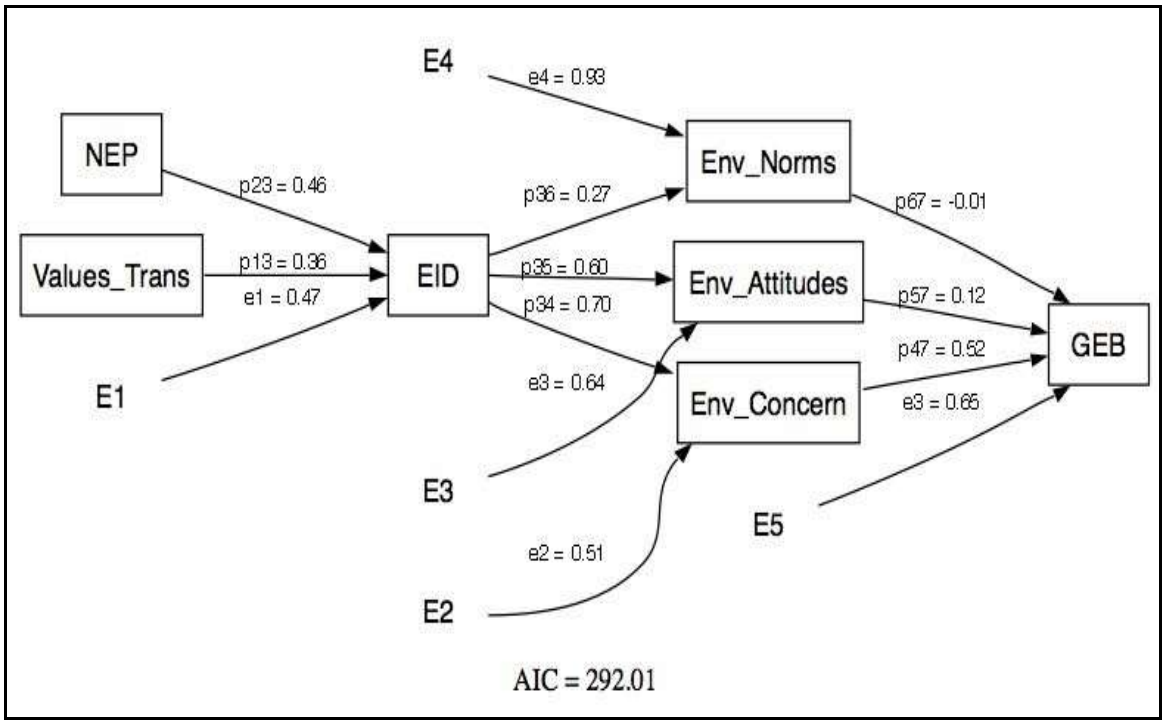

Figure 4.4 Complete Hierarchical Model

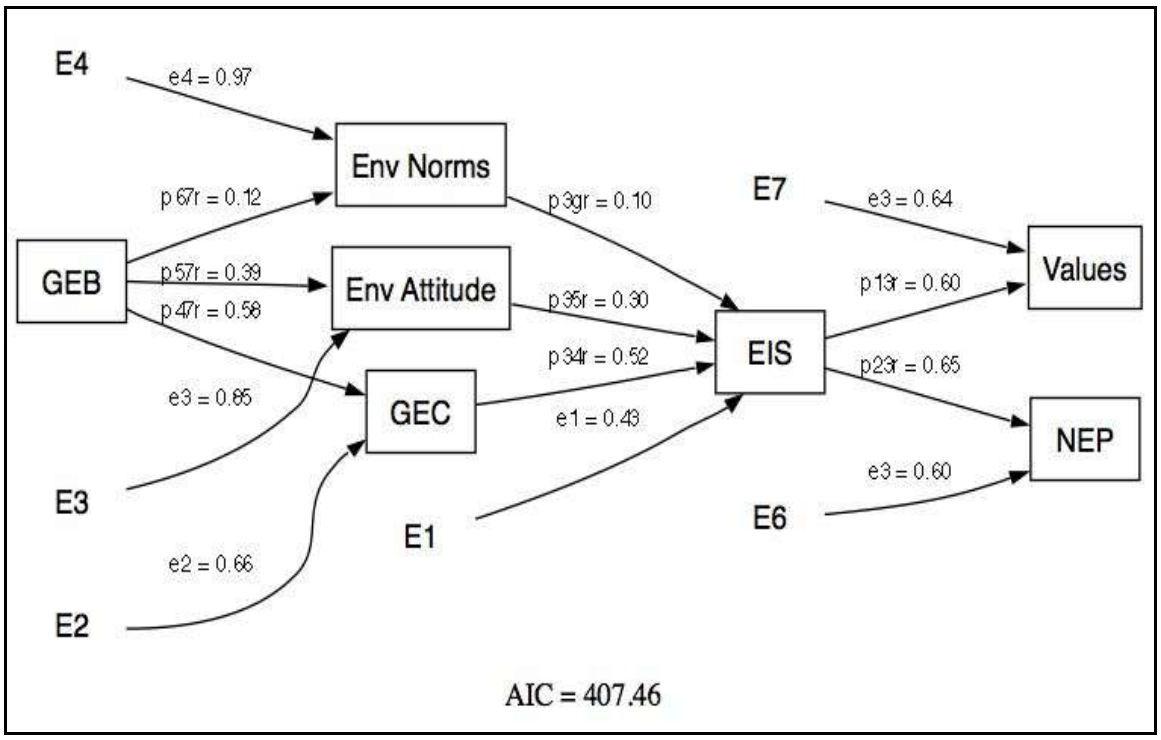

Figure 4.5 Complete Behavioral Model

Several intervening models were tested. Interestingly, one of them scored higher than the complete model on the AIC, even though they had fewer variables.[113] This suggests that the complete model better explains pro-ecological behavior than this reduced model. After running 8 models, the best approximating intervening model was decided on. It is presented in Figure 4.6 (next page). It incorporates three predictor variables; worldviews and values are modeled in distal positions, and Ecological Identity is measured as a proximal intervening variable. This model scores a very low AIC of 27.34. This is markedly lower than all of the other intervening models that were tested.[114] The path coefficients to Ecological Identity don't change from the complete model, but notice the large path coefficient from Ecological Identity to pro-ecological behavior.

[113] One for instance was AIC = 301.
[114] One for instance was AIC = 301, Another was AIC = 208, and still another was AIC=112.

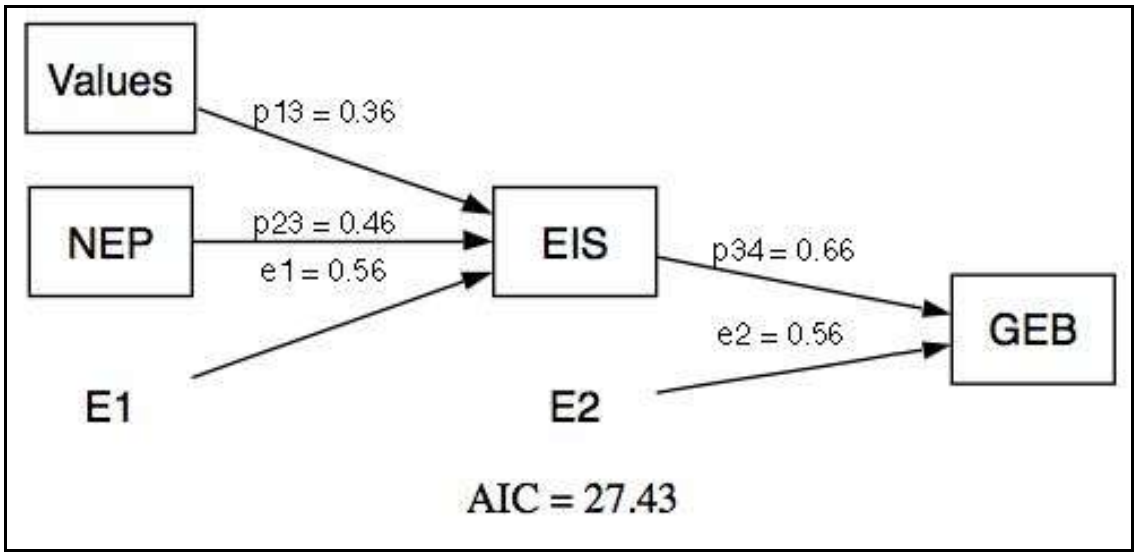

Figure 4.6 Best Approximating "Intervening Model"

Finally, several direct models were tested, and the best approximating direct model was decided on. It is presented in Figure 4.7 (next page). It incorporates a single predictor variable Ecological Identity and scores an AIC of four (4). In this case, there were however several alternative models that were very close; Environmental Attitudes and Concern in particular each scored an AIC of 4 as well, however the ratio of the path coefficient estimate to the error term was much worse for these two, and thus the model in figure 4.7 was determined to be the best approximating direct model.

Conclusion

Over two-dozen path models within the intervening and direct classes were tested. The multi-model comparison identified three top performing models of varying complexity. The complete model (Figure 4.3) incorporates measures of several social psychological constructs into a complex set of relationships that effectively explain pro-ecological behavior. Furthermore the position within the model that Ecological Identity was hypothesized to occupy is fairly well supported by the moderately strong path coefficients leading to and from it. This conclusion

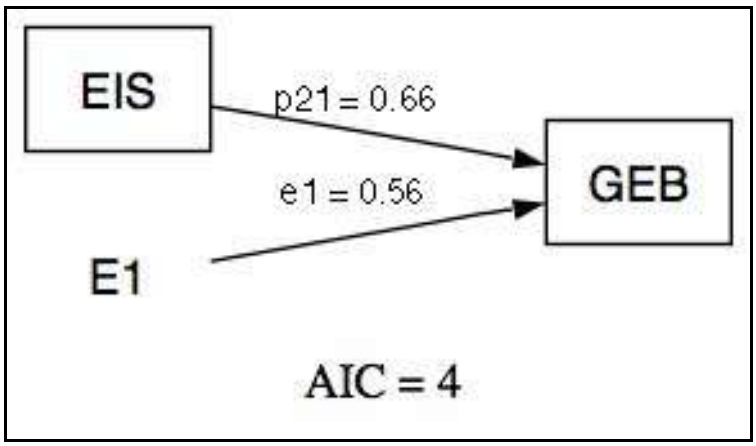

Figure 4.7 Best Approximating “Direct Model”

is also partially supported if we consider the top performing intervening model (Figure 4.4). In this model, Ecological Identity fits well again in a position of closer proximity to behavior than both Values and Worldviews, and the AIC for this model is quite low (27.43) in relation to other intervening models that were tested. However, the original assumption that Ecological Identity was more distal to behavior than Environmental Attitudes, Norms, and Concern does not seem to be supported by this analysis. In fact, it appears from the best approximating direct model that Ecological Identity needs to be modeled in a position that is most proximal to behavior.

After testing in upwards of two dozen models, the model with the overall lowest AIC and best performance is the direct model where Ecological Identity explains pro-ecological behavior. From this it can be concluded that the EIS scale explains the most variance in a more parsimonious way than any other combination of variables. The identification of the EIS as the best, most parsimonious candidate model provides additional support for its predictive validity.

CHAPTER V
SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Overview

The concluding chapter of this dissertation covers several things. First is a brief discussion of the overriding theme of this research: integration. Next is a brief summary of the three stage research design that was followed. Third is a discussion of the key conclusions that can be drawn from the research, and the implications they have for environmental sociology, social psychology, and social and critical theory. The fourth section addresses some implications this research has for policies and programs designed to address environmental problems. The chapter and dissertation concludes with a discussion of the limitations of the project, its strengths, the lessons that have been learned, and suggestions for future research.

Summary: An Integrative Approach

Scientific research can be thought of as a collective enterprise whose goal is to accumulate useable and substantively meaningful knowledge over time. To achieve this goal, theories, methods and results must be able to be compared and contrasted. Importantly however, many have argued that the research process and the knowledge it produces can become ossified and fail to increase understanding. Indeed, researchers must guard against such "Normal Science" because it "does not aim at novelties of fact or theory and, when successful, finds none"(Kuhn, 1962, 52).[115] The integrative approach taken in this dissertation is one way to guard against this risk. Through purposeful integration both within and between domains of theory and method, the goal of accumulating useable and substantively meaningful knowledge can be achieved, and the risks associated with "Normal Science" can be averted. Indeed, by integrating across

[115] It is acknowledged that Kuhn argued that scientific revolutions are non-cumulative. The argument being made here is that integration offers an alternative.

traditional boundaries, dominant research paradigms can be challenged, thus allowing for new understandings to emerge.

Scientific inquiry into social psychological aspects of the environment and environmental issues needs integration for just these reasons. Although nearly 50 years of research has produced significant contributions to our understanding of the drivers of pro-and anti-ecological behaviors, this field is characterized by relatively rigid theoretical and methodological boundaries, leading some to characterize this area as factionalized and lacking progress (De Rosa, 2006). This is true of research on identity in relation to the environment: the existing measures have important theoretical and methodological weaknesses that have inhibited their widespread use and effectiveness in both applied and theoretical research.

In response, this dissertation takes steps toward integrating different theoretical and methodological approaches from within and outside of environmental social psychology. First, the Ecological Identity framework integrates key aspects of two theoretical traditions (IT and SIT), and also incorporates aspects of more critical approaches to identity research (i.e., dis-identification). Methodologically, both qualitative and quantitative research strategies were used to develop the framework of EI and the EIS scale; and each was integrated with other more established constructs to test an exploratory model of pro-ecological behavior. Finally, the traditional null-hypothesis testing paradigm was challenged by integrating an a priori statistical power analysis with an information-theoretic approach to multi-model comparison testing. Combined, these integrative efforts produced strong and more easily comparable results that help to increase our understanding of the ways individuals view themselves and their actions in relation to nature and the biophysical environment. The next section briefly reviews the three stage design that was followed to produce these results.

A Three Stage Research Design

A three stage research design was created to implement these integrative approaches in order to build the EIS scale and demonstrate its validity and reliability from the ground up. The first stage involved hosting a series of focus groups to help explore the theoretical assumptions of EI, and to identify what types of indicators should be used in trying to measure it. This known-groups approach to scale development has not typically been done and represents a major contribution of this dissertation.

Stage (2) was a statistical assessment of the validity and reliability of the EIS scale and the underlying construct of EI. It began with a pre-test questionnaire and power analysis to determine an appropriate sample size for validity testing. Next, descriptive statistics, item-analysis, Alpha reliability testing, and a Principle Components Analysis were conducted as initial tests of construct validity and internal reliability. Finally, in Stage (2), several additional tests of validity were conducted using the sample size determined in the pre-test power analysis.[116] The results of Stage (2) confirmed that the EIS scale reliably measures an underlying construct (Ecological Identity). Stage (3) involved testing an exploratory model of pro-ecological behavior that integrated EI with other more established theoretical constructs using the full sample.[117] The results from Stage (3) provided even stronger evidence for the construct validity of the EIS scale, and consequently for the underlying construct of EI. Conclusions and implications of these results are discussed in greater detail below.

Conclusions: EIS Scale

The strong results from this dissertation allow us to draw conclusions about the EIS scale and the underlying construct of Ecological Identity. They also allow us to suggest implications that this research may have for the existing

[116] N = 28 for correlation analyses and N = for regression analyses.
[117] In full sample testing, N = 497

measures of Environmental Identity and research on Identity in general. The first set of conclusions, discussed next, relate to the EIS scale.

Both the means of constructing the items comprising the EIS scale and their statistical testing demonstrated the scale's validity and reliability. To begin with, the items were based on information obtained from focus group meetings with members of environmental organizations. Participants were selected to reflect a range of organizational differences in purpose, mission, and past actions. Members of environmental organizations have been shown to hold known sets of attitudes, beliefs, and worldviews that are directly related to identification with nature and the biophysical environment (Kitchell et al., 2000). The insight into Ecological Identity obtained in these meetings was systematically coded and linked to the conceptual framework of EI, and from this the scale items were derived. These rigorous procedures helped to ensure that the scale items covered the full range of meanings associated with EI (cf. Raykov and Marcoulides, 2011). Thus, we can conclude that the scale has a high level of **content validity** (cf. Nunnally, 1978).

The statistical testing of the EIS scale, via the student survey, provided strong support for its **reliability**. For instance, nearly all the EIS scale items were found to be moderately to strongly inter-correlated and the Alpha reliability coefficient for the scale was (.91). In essence, this means that throughout the sample respondents were answering each of the items in the scale in a consistent and similar way. That is, people who had internalized a strong Ecological Identity consistently scored higher on the EIS scale items.[118] This demonstrated that the EIS scale has a high degree of internal reliability. Furthermore, consistent results were found across multiple subsamples when testing the relationships between the EIS scale and measures of other constructs (e.g., environmental concern, values, worldviews, and attitudes). This demonstrated a high degree of cross sample reliability.

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[118] And Vice Versa

Additional statistical testing, again via the student survey, provided strong support for the scale's **construct validity**. A Principle Components Analysis using the full sample (n = 497) demonstrated that over half the variance (53%) in the 29 EIS scale items could be explained by a single component. This result verified that the items were in fact measuring some underlying construct (i.e., Ecological Identity). Next, using the optimal sample size determined in the pre-test power analysis for correlation (n = 28), a series of correlation analyses was used to demonstrate that the EIS scale related in theoretically predictable and statistically significant ways with measures of more established constructs. Strong, positive, and statistically significant relationships were found across multiple samples between the EIS scale and each of the following: the New Ecological Paradigm scale, self-transcendent values, environmental concern, pro-environmental attitudes, and pro-ecological behavior. Interestingly, the EIS scale was more strongly correlated to pro-ecological behavior than any of the other constructs. Weaker yet statistically significant relationships were also found between the scale and pro-environmental norms. Finally, the EIS scale was found to be weakly and negatively related to values related to power.[119] All of these relationships were in the expected direction and offer strong support for the scale's **convergent validity**. Similar correlation analyses were conducted using the secondary component scores for each of these scales to demonstrate the extent to which the EIS was discriminant from these other constructs. These tests revealed that the EIS was in fact **discriminant** from these other constructs, and is tapping into something that the others are not.

Next, using the optimal sample size determined for regression in the pre-test power analysis (n = 26), a series of random-effects regressions demonstrated the powerful ability of the EIS scale to explain pro-ecological behavior. Moreover, these regressions compared directly the explanatory power of the EIS scale with the New Ecological Paradigm scale, a well established

[119] In one of two analyses, the relationship between EI and power values was not statistically significant.

measure of ecological worldview. Across multiple subsamples, the EIS scale better explained pro-ecological behavior than the NEP scale. This analysis demonstrated strong support for the **predictive validity** of the EIS scale. The statistical confirmation of these relationships across multiple subsamples using the optimal sample size ensures that the findings are both statistically and substantively meaningful. This rigorous form of testing has not typically been done in the social sciences and represents another contribution of this dissertation.

With confidence that the relationships between the EIS and other scales were legitimate, the final statistical analysis used the full sample (n = 497) to test a number of exploratory models of pro-ecological behavior that integrated EI with other, more established theoretical constructs. This was done through a series of structural equation path modeling using information-theoretic techniques of multi-model comparison to determine a small number of best approximating models. The results demonstrated that Ecological Identity could be effectively integrated with other constructs into a series of classes of models ranging in complexity.[120] The best approximating model in the most complex class integrated Ecological Identity with ecological worldviews, self-transcendent values, environmental concern, pro-environmental attitudes, and pro-environmental norms into a model that explained ecological behavior (AIC = 292). Furthermore, this revealed that several simpler models, each containing EI, more parsimoniously explained pro-ecological behavior. The best approximating model in the class of medium complexity incorporated self-transcendent values and the NEP as distal drivers, operating through ecological identity to influence pro-ecological behavior (AIC = 27). Finally, the simplest model that best explained pro-ecological behavior was a bivariate model with EI as the sole influence of pro-ecological behavior (AIC = 4). The fact that EI was an essential factor in each of the best approximating models across the different

[120] Recall from Chapter 4 Stage (3), the classes of models were ‘complete’, ‘intervening’, and ‘direct’.

classes of models provided even stronger evidence for the **construct and predictive validity** of the EIS scale.

In conclusion, the EIS scale was built from the ground up in three stages. Evidence of its reliability and validity was demonstrated in the way it was constructed and in later statistical testing. Indeed, it certainly seems as though the EIS scale is "measuring what we want it to measure, all of what we want it to measure, and nothing but what we want it to measure" (Thorndike and Hagen, 1977, 56-57). The validation of the EIS scale allows us to conclude that the underlying construct of ecological identity is valid as well.

Conclusions: Ecological Identity

Results from this dissertation also allow us to draw conclusions about some of the more theoretical aspects of Ecological Identity, such as its dimensionality and how it operates on different levels of analysis. For instance, internalization of a strong ecological identity involves both role-based aspects and social category-based aspects. On the role-based level, it involves an acknowledgment of the interdependence of social and biophysical systems, which leads to the internalization of pro-environmental behavioral expectations and dispositions (i.e., roles). In this sense, people with a strong EI take on the role of nature and the wider environment, construct an understanding of the relationships they have with it, and attribute a set of unique role expectations to themselves in recognition of this interdependence. These aspects of Ecological Identity are embodied in Weigert's (1997) notion of the Generalized Environmental Other. Some of the ecological roles identified in this research were: being a protector of wildlife and natural habitats, being thoughtful about where one's food and resources come from, and making changes in behaviors that are ecologically harmful. Furthermore, this dissertation shows that ecological identification on this level directly translates into engaging in specific behaviors such as recycling, purchasing ecologically friendly products, and minimizing energy use.

On another level, internalization of a strong EI has also been shown to be comprised of identification with certain groups and social categories. Indeed, "It is important to acknowledge that an environmental identity is also at least in part a social identity" (Clayton, 2003, 53). As the framework suggests, through categorizing one's self as being a part of nature or a member of some pro-environmental group, people begin to define themselves through the characteristics they (and others) ascribe to the group. For instance, if the social category is nature, then the individual internalizes the characteristics they ascribe to nature and become an embodiment of it.

Some of the group and category characteristics of EI identified in this research were: having the same goals as environmentalists and seeing oneself as similar to other animals. Like role-based ecological identification, the internalization of pro-ecological attributes affiliated with certain groups and social categories also translates into engaging in specific pro-ecological behaviors (e.g., recycling, purchasing ecologically friendly products, and minimizing energy use).

However, another important conclusion is that identification with pro-ecological roles and social groups or categories is only part of the identification process. It was evident in this research that a part of having a strong Ecological Identity arises from differentiating oneself from various salient oppositional others. This differentiation was found to occur on both the social and role-based levels of analysis. For instance, on the role-based level it involves differentiating oneself from sets of behavioral expectations and dispositions that are thought to be bad for the environment such as prioritizing the pursuit of material wealth and possessions. On the social category-based level of analysis, it was shown that differentiating oneself from groups thought to be anti-ecological is part of internalizing a strong Ecological Identity. Some of the out groups that were identified in this research were Republicans and conservatives, groups that promote business interests, and people who doubt global warming is caused by human activities.

Finally, it has been shown that internalization of a strong EI also involves prioritizing the relationships, roles, and group affiliations connected to the Identity it. This prioritization includes two facets: having a large number of highly valued relationships that are in some way connected to aspects of nature, the environment, or environmental issues; and defining oneself through these relationships, roles and group affiliations more so than others. In these ways, internalization of a strong Ecological Identity means it occupies a more central place within the overall self-concept than other identities.

Given that each of the characteristics discussed above is associated with internalization of a strong ecological identity what can we conclude about EI's relationship with other more established social psychological constructs. This research focused particularly on two constructs: Ecological Worldviews and Pro-ecological Behavior. To understand what the results of this research can tell us about the relationship between these three constructs, it is important to first understand the conceptual distinction between Ecological Identity and Ecological Worldview.

Conceptually, people who have adopted an ecological worldview tend to adopt a set of primitive beliefs about nature, the Earth, and humanity that connect them with the environment. On the other hand, people who have internalized a strong ecological identity see themselves as part of an integrated social and biophysical (i.e., ecological) system characterized by interconnected processes and relationships. It was evident in the results of this analysis that someone who has adopted an ecological worldview is also very likely to internalize a strong ecological identity.[121] That is, not only do they believe they are connected to the environment (i.e., worldview*)*, but they have also internalized a set of roles and attributes that place them within an ecological system (i.e., Ecological Identity).

[121] Recall the strong bivariate correlations found between the two in the Stage 2 analysis.

This is a subtle distinction that brings to the fore the conceptual difference between worldviews and identities. Whereas worldviews are beliefs about objects treated as external to the self, an identity encompasses beliefs and meanings attached to both the self and the object. This conceptual distinction likely explains why EI was consistently found to better explain pro-ecological behavior. That is, EI taps into the ways pro-ecological behavior can be directly linked to the self-concept via roles and group affiliations. If a set of ecological behaviors is linked to the self by way of a strong ecological identity, the relative success someone has in executing these behaviors has profound consequences for the self-concept (e.g., self-esteem, self-verification). This internalizing process is why many researchers believe identity has the potential to explain a wide array of behaviors and behavioral change across situations, including shifts in overall lifestyle toward more sustainable practices (Devine-Wright and Clayton, 2010).[122]

Conclusions: The Existing Measures of Environmental Identity

The conclusions drawn from this dissertation regarding the Ecological Identity framework and scale have clear implications for existing measures of environmental identity. A primary goal of this research is to improve upon these measures, both theoretically and methodologically. The case was made that the EIS scale improved upon the existing measures because of the plans and procedures use to develop it (i.e., content validity). Indeed, it was shown to be highly reliable and valid across multiple tests of statistically robust sample sizes. It has been pointed out that each of the existing frameworks is grounded in a separate theoretical tradition, and the framework of EI integrates these traditions into a unified construct. Additionally, EI incorporates critical aspects of the identification process (i.e., differentiation and dis-identification) that are absent

[122] Another related reason for EI's better explanatory power is because it operates on a level of specificity that more greatly corresponds to behavior. That is, EI is more proximally located in relation to behavior.

from other frameworks. Consequently, we can conclude that EI covers an increased amount of complexity related to identity and thus covers more of the construct domain. In conclusion, it appears that the results of this research provide strong initial evidence that the theoretical framework of EI, and the scale designed to measure it (EIS scale), improve upon the existing research on identity in relation to nature and the biophysical environment.

Implications for Identity Research in General

The results and conclusions of this dissertation have implications for research on identity in general. First, it is possible that the development of the EIS scale can help improve our understanding of the best ways to measure identities. The literature review shows that some researchers have criticized past measures of identity as lacking construct validity because they, "do not really address a person's identification with a social group or with a social role" (Fishbein and Ajzen, 2010, 293). Indeed, it is often the case that measures of identity appear to instead measure someone's behavior, norms, or attitudes (e.g., "I spend a lot of time in natural settings").[123] The EIS scale addresses this issue by introducing each of the 29 items that comprise the scale with language directly related to identification (i.e., "I am someone who…" "I identify with..." "We are..."). In this way, respondents are prompted into self-reference, and researchers can be more confidence of tapping into identification and not something else. This development is important because the integration of identity with other social psychological constructs has been slow, in part because of these measurement inadequacies (Fishbein and Ajzen, 2010).

The second implication of these results for the broader area of identity research is related to an often-cited critique of social psychological identity theories. Many theorists, both within and outside of social psychology, argue that contemporary social psychological treatments of identity are overly individualist,

[123] This is one of the items from the EID scale (Clayton, 2003, 61)

reductionist, and decontextualized (Berezin, 2010, Abrams and Hogg, 1999). This criticism has also been made within the environmental literature where structurally and critically oriented theorists have argued that identification with nature and the environment is tantamount to Marxian superstructure, and may unwittingly recreate the false duality between human societies and the natural world (Harvey, 1996; Cronon, 1995). Consequently, these theorists caution against an "uncritical identification with nature" (Martin, 2011, 115).

It is important for social psychologists to reconcile these assessments with their mission to understand and ultimately change human behavior toward more sustainable practices. The theoretical accomplishments of this dissertation address some of these concerns. Indeed, by successfully integrating key aspects of two different theories of identity, one individually role-based and one social group and category based, Ecological Identity escapes the trappings of an individualist, reductionist and decontextualized analysis. Furthermore, by incorporating critical aspects of the identification process (i.e., differentiation and dis-identification), the role played by power, conflict, and control is acknowledged and can be investigated on a social psychological level.

Summary of Conclusions and Implications

The results of this dissertation contribute to environmental sociology, social psychology, and the field of sociology as a whole. Ecological Identity and the EIS scale offer an integral construct and measure of the extent and ways by which people view themselves as part of an integrated social and biophysical (i.e., ecological) system characterized by interconnected processes and relationships. The scale was developed through a carefully designed set of stages that involved both qualitative and quantitative research methods. Theoretically, the incorporation of key facets of multiple theories and perspectives on identity yielded a construct that more fully covers the range of complexity involved in identification with nature and the biophysical environment.

In conclusion, both the results of this research and the strategy used to achieve them, offer innovation and insight to the social sciences.

Program and Policy Implications

Earlier it was argued that one of the proposed solutions to our ecological dilemma has been to study, understand, and ultimately change human behavior. By improving our understanding of the social psychological drivers of pro and anti-ecological behavior, Ecological Identity and the EIS scale contributes to this effort. It seems likely that educational and policy efforts oriented toward behavior change may be improved if they incorporate the results of this study. For instance, the findings presented here suggest that the internalization of pro-ecological roles is one of the strongest drivers of behaving in consistently ecologically friendly ways. It would seem then that attempts to articulate and promote the types of behavioral and dispositional expectations that comprise these roles could be an effective strategy to promote sustained behavioral change. Links between the research in this dissertation and the environmental education literature seem to be an effective way to accomplish such a goal.

The second implication this research has for programs and policies that address environmental problems relates to the information-theoretic techniques used in Stage (3). It seems likely that these techniques could used to facilitate the initiation and implementation of green policies and programs. Information theoretical techniques emerged in the biological and ecological sciences with researchers' attempts to understand complex systems in simple ways. The primary goal of such an approach is to compare multiple models and assess the 'best approximating model' for a given set of phenomena under investigation. The best approximating model among a set of candidate models is the one that most thoroughly explains the data, in the most parsimonious way. This approach was adapted in Stage (3) by establishing the best approximating model for different classes of models that ranged in complexity. This is appropriate in a social science context because individual researchers working in the same area

may have different questions and objectives for their research. Consequently, the overall most parsimonious model may not be appropriate.

There seems to be potential in applying this adapted approach via survey research to facilitate the initiation and adoption of green policy and program initiatives. Consider, for instance, a public or private group that wants to launch a green initiative such as a recycling or a bike share program. It would be valuable for these groups to understand the likelihood of community members supporting them. A small survey with a valid and reliable social psychological measure that could best approximate the views of the target population could help facilitate the implementation of such initiatives. Moreover, this could be done in a very cost effective and productive way. First, social scientists could work with the group to come to a clear understanding of the priorities for the survey. Second, past information theoretic studies into the social psychological drivers of pro-ecological behavior could be compared to help determine the model of behavior most suited to the target population and research priorities. This would in turn help determine the smallest most cost effective number of survey indicators needed to be able to model sample data in the most parsimonious way. Results from the survey would thus provide knowledge about the target population that could be used to tailor educational and informational campaigns to encourage public support and participation.

Finally, understanding Ecological Identity might help address some difficulties that often arise when attempting to initiate pro-ecological policies and programs, or resolve resource related conflicts. For instance, this dissertation shows that differentiation, on the social category-based level of analysis, can lead to dis-identification and stigmatization of certain groups and social categories. It seems that these identity dynamics could complicate the type of political communication, compromise, and collaboration these situations require. The EI framework however gives us insight into the inter-group dynamics that may be at play. It suggests that what may really be at stake in environmental conflict scenarios is a sort of identity politics whereby people project meanings

onto others in order to serve their own socio-cognitive needs of meta-contrast and self-enhancement (Daniels and Walker, 2001; Hogg et al., 1995). That being said, an increased understanding the dynamics characteristic of the modern ecological identity may facilitate both individual and collective self reflection, in turn raising people's awareness of the symbolically constructed categories of similarity and difference that inevitably complicate language and action. Understanding these dynamics may be a useful tool for resolving such conflict scenarios.[124]

Limitations, Strengths, Lessons Learned and Future Research

Although this research successfully achieved its objectives, it has several limitations. One significant limitation relates to an underlying assumption characteristic of social psychological investigations of pro-ecological behavior. Specifically, this type of research assumes that changing what are, for the most part, individual level behaviors will produce cumulative results that can mitigate the negative environmental impacts of modern societies. This assumption is problematic.

One potential problem relates to what Kaiser (2003) calls ecological validity. Ecological validity refers to the extent to which a behavior, thought to be pro-environmental, is in actuality better for the environment than some alternative (Kaiser et al., 2003). For instance, people may choose one behavior over another, believing that it is more ecologically friendly (e.g., paper bags vs. plastic bags when shopping). However, the actual difference in impact between the two may be negligible or even the reverse of what is believed.[125] The potential

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[124] This comes close to what Habermas (1981) referred to as communicative rationality. This is obviously not a position free of criticism and the feasibility of an 'ideal speech situation' might be tenuous at best, still, it can be deployed as, "a useful counterfactual against which distortion can be measured" (Calhoun et al., 2007, 361).

[125] *Indeed, research suggests that a large number of eco-labeling schemes designed to communicate the relative ecological validity of a particular product, are in fact industry dominated and typically focus exclusively on the 'use phase' of a given product ignoring the impacts that occur during the production and disposal phases (Sheuer & Keoleian, 2002, 13).*

mismatch between pro-environmental intent and actual environmental impact has been referred to recently as the “behavior–impact gap (BIG) problem” (Csutora, 2012, 148). These behavior-impact-gaps may result from sources that are largely outside the control of individuals, which presents problems for behavioral researchers.

This does, however, open an opportunity for future integrative research. Specifically, social psychological researchers rarely assess the ecological validity of the behavioral indicators they use, even when the potential does exist (Csutora, 2012). A technique has been developed in the natural sciences that can help social scientists improve the ecological validity of the behavioral indicators used in research. Life cycle Assessment (LCA) is an internationally standardized framework for analyzing the “cradle to grave” impact of products and household consumptive activities. Over the last 40 years, researchers have collaborated to produce LCA databases and inventories for products, materials, and processes so that the overall impact of the entire production, consumption, and disposal system required for a single type of commodity, household resource, or category of consumption (e.g. transportation, agriculture, etc.) can be estimated. Future research that integrates sound social psychological theories and methods with Life Cycle Assessment strategies could contribute to the understanding and mitigation of environmental problems. Indeed, if we intend to change behaviors as a potential solution to environmental problems, we must make these efforts.

A second limitation of this research is the sample population used for the survey. Given that the survey was distributed to a sample of UT undergraduate students, the possibility of inference outside of the university is limited, and science is often interested in the relative generalizability of findings. Importantly though, inference was not a primary goal of the study. Instead, the goal was theory and scale development. Future research however should be directed toward testing the applicability of the EIS scale in more general populations. Moreover, research using information-theoretic approaches could contribute to

establishing the best integrative models for both theoretical and practical use. Finally, although a strong case has been made that the EIS scale improved upon existing measures of environmental identity, there was no direct comparison between them. Future research that more directly compares these different scales is warranted.

In closing, I would like to acknowledge some lessons I learned from this research process. First, good social research takes an enormous amount of time and energy. I respect each of my committee members and all social scientist who engage in research. While it is time consuming and energy draining, it is also rewarding to develop an idea, implement a plan to investigate the idea, then draw conclusions. Finally, the importance of reflection in every step of the process is vital. Reflection allows researchers to position their thoughts, writing, and findings in relation to one another, allowing them to connect in coherent and productive ways.

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APPENDIX

Pre-focus group questionnaire

This *pre-focus group questionnaire* asked interested individuals to provide information that was used in the final selection of participants. The pre-meeting questionnaire…

1) Asked interested students their current enrollment status (i.e. Graduate or Undergraduate)
2) Gauged their level of interest in participating in a focus group meeting.
3) Asked interested participants if they currently belong to an environmental organization.
4) Asked interested participants to provide basic demographic information (Year in School and Sex)
5) Asked interested participants to provide preferred meeting dates.
6) Asked interested participants to provide contact information (e.g. email address)

Of the 40 assumed to respond as interested and hence complete the pre-meeting questionnaire, 15 will be selected on the basis of the information provided on the pre-meeting questionnaire to receive an official *invitation email.* Selection will be based on the following criteria:

1) Obtaining only undergraduate students that do not belong to an environmental organization
2) Obtaining those individuals who indicate the highest interest in participating
3) Obtaining a diversity of individuals in terms of year in school and sex)

Protocol and Order of Events for Focus Group Sessions

As was discussed above, a total of four focus groups will be conducted, and interested participants will be asked to complete a small web-based qualifying questionnaire that will aid in the final selection process. All focus groups sessions will involve incentives in the form of refreshments during the meetings, an each participant will also receive a $20 gift certificate to a local restaurant. Upon completion of the focus group sessions, all participants will be asked to complete an exit questionnaire (see appendix A). The following section will describe key characteristics about the protocol and order of events to be followed in the focus groups.

Location/facility:

With the exception of focus group session 1, (See Section IV Results Step 4 – 5), the meetings will take place on the University of Tennessee, Knoxville campus, in Hodges Library. Specifically, the University library contains several group viewing rooms with seating capacity from 20-45.

Library Administration: 865-974-6600

Contact information: Michael Dodson 865-974-4351

mediacenter@utk.edu

Parking:

Participants will receive free parking for the Volunteer Hall parking garage (Behind law school) to be paid for by the University of Tennessee Department of Sociology. Upon entry to the garage participants will take a ticket from the automatic dispenser. Upon meeting researchers, all participant parking tickets will be validated (guaranteeing the reduced rate). The ticket will then be given to the parking attendant to be sent to the Sociology department. Given that this is a few blocks from the Library, a map will be provided to all participants.

The Meetings:

The meetings will follow established small-group interviewing procedures:

1) 8 to 10 participants, one primary facilitator, and 1 co-facilitator.
2) The primary facilitator will be the project investigator (Tobin N. Walton)
3) Expected arrival time for participants will be 20 minutes before the meeting officially begins.
4) Participants will be asked to read and sign an “informed consent” form and statement of confidentiality for the protection of human subjects.
5) As will be stated in the informed consent document and recruitment letters and contacts, all meetings will be audio recorded.
6) Participants will be provided with name tags, cards, pens, pencils, and notepads.
7) Refreshments will be provided prior, during, and directly after each meeting.
8) The official length of each meeting will be 1 ½ hours with a ten minute break at about the 45 minute mark.
9) Drawings for two “prizes” will be held at the end of each focus group meeting. The participants will return their name tags to the principal investigator, and the co-facilitator will draw two names at random to determine the prize winners.
10) Upon closing the meeting, participants will be provided with a brief exit questionnaire.
11) Debriefing and informal discussions with participants will be conducted for up to an half an hour after the meeting.

Moderator Protocol & Schedule of Events:

(25 minutes) <u>Facilitator set up</u>

(20 minutes prior) <u>Participant arrival</u>

START

(5 minutes)	Introduction & Welcome
(25 minutes)	Participant Response to Questions #1 - #4,
(10 minutes)	Break
(25 minutes)	Participant Response to Questions #5-#8.
(15 minutes)	Participant Responses to Questions #9 - #11.
(10 minutes)	Concluding Remarks, Drawings for Prizes and Completion of Exit Questionnaire
END	
(40 minutes)	Clean-up, organize & align all written and audio documentation,
(25 minutes)	Reflection and Notes
(25 minutes)	Replace audio tapes, refresh food, if another session follows

Objectives, Questions, and Rationales: Focus Group Sessions

(In order of Discussion)

Objective 1: Uncover the extent and degree that focus group participants see themselves as similar to (or the same as) nature and the biophysical environment. Determine the content and attributes of how this similarity is experienced, (i.e. what are the meanings they attach to both themselves and the biophysical environment?)

(Sameness Dimension of EI).

Questions:

1) To what extent do you see yourself as being similar to nature and the biophysical environment, and if so, what are some of the ways?
2) How are these things expressed in 'who you are', 'what you 'do', 'what you 'have', and in 'what you 'know'?

Rationale: Questions 1 and 2 are designed to elicit information about the degree and ways, participants see themselves as being similar to nature and how it may be symbolically represented and expressed in their everyday life.

Objective 2: To obtain information about the extent and degree that focus group participants see themselves as unique among nature and the biophysical environment. Determine the content and attributes of how this uniqueness is experienced, (i.e. what are the meanings they attach to themselves as human that they do not attach to nature and the biophysical environment and conversely, what are the meanings they attach to various elements of the biophysical environment that are not attached to humans?)

(Sameness Dimension of EI: Inclusion end of the sameness continuum)

Questions:

3) To what extent do you see yourself as being different from nature and the biophysical environment, and if so, what are some of the ways?
4) How are these things expressed in who you are', 'what you 'do', 'what you 'have', and in 'what you 'know'?

Rationale: Questions 3 and 4 are designed to elicit information about whether and in what degree participants see themselves as unique within the larger category of nature and the biophysical environment (i.e. within-group distancing). These questions will tap into the meanings they attach to themselves as human that they do not attach to nature and the biophysical environment, and conversely, into the meanings they attach to various elements of the biophysical environment that they do not attach to humans. Lastly, question four will illicit how the participants see this difference symbolically represented through what they have, are, do and know.

Objective 3: Uncover the extent and degree that focus group participants see themselves as similar to (or the same as) "environmentalists". Determine the content and attributes of how this sameness is experienced (i.e. what are the meanings they attach to both themselves and the social category of "environmentalist"?)

(Sameness Dimension of EID scale).

Questions:

5) To what extent do you see yourself as being similar to (or the same as) environmentalists, and if so, what are some of the ways?
6) How are these similarities expressed in 'who you are', 'what you 'do', 'what you 'have', or 'what you 'know'?

Rationale: Questions 5 and 6 are designed to elicit information about whether and in what degree participants see themselves as environmentalists as well as how they experience this sameness as symbolically represented through what they have, are, do and know.

Objective 4: Obtain information about the extent and degree that focus group participants see themselves as unique within the larger category of , environmentalists (within-group distancing). Determine the content and attributes of how this uniqueness is experienced (i.e. what are the meanings they attach to themselves as people who "protect" the environment that they don't attach to "environmentalists", and conversely, what are the meanings that they attach to "environmentalists" that they do not attach to themselves?)
(Sameness Dimension of EI: Inclusion end of sameness continuum)

Questions:

7) To what extent do you see yourself as being unique among "environmentalists"?
8) How is this uniqueness expressed in 'who you are', 'what you 'do', 'what you 'have', or 'what you 'know'?

Rationale: Questions 7 and 8 are designed to elicit information about whether and in what degree participants see themselves as different from "environmentalists". These questions will tap into the meanings they attach to themselves that they do not attach to "environmentalists", and conversely, the meanings they attach to various "environmentalists" that they do not attach to

humans. Lastly, question four will illicit how the participants see this difference symbolically represented through what they have, are, do and know.

Objective 5: Uncover who/what categories and groups constitute salient oppositional others for focus group participants. Determine the content and attributes through which this differentiation is experienced (i.e. what are the meanings they attach to salient "oppositional out-groups"?)

(Differentiation Dimension of EI)

Question:

9) Are there any groups of people that you see as the opposite of you, or as 'outsiders', expressing a fundamentally different view of the world and their place in it than you do?
10) If so, who are some of these groups?
11) What is it about 'who they are', what they do', 'what they have', or 'what they know', that makes them so different from you?

Rationale: These questions are designed to elicit information regarding the types of individuals and groups that constitute salient oppositional others. Furthermore, these questions will tap into the meanings they attach to these others.

Focus Group Exist Questionnaire

Identity and the Environment: Exit Questionnaire

Thank you again for your help on this important project. We would greatly appreciate your continued help by responding to the following questions. Please return this form to Tobin after your scheduled session. Return of this survey will constitute your informed consent to participate in it.

(I) Instructions: In questions 1-6 we are interested in the relationships you have with other people that might be considered by some to be 'environmentalists'. Please indicate your response by circling the appropriate number.

1. How likely are you to discuss your advocacy on behalf of the environment with each of the following people?

	Not Likely				Very Likely
Co-worker	1	2	3	4	5
The friend of a close friend	1	2	3	4	5
The friend of a family member	1	2	3	4	5

2. How close are you to other people who want to protect and preserve the environment?

Not Close — Very Close

1 2 3 4 5 6 7 8 9 10

3. How much would you miss your relationships with these people if they were no longer in contact?

Not At All — A Great Deal

1 2 3 4 5 6 7 8 9 10

4. How often do you socialize with other people who have thoughts about the environment similar to your own?

Never									Daily
1	2	3	4	5	6	7	8	9	10

5. How many hours per week do you spend with people who have thoughts about the environment similar to your own?

None 1-3 4-6 7-9 More than 9

6. How large of a role does protecting and preserving the environment play in the ideal person you strive to be?

Small Role				Large Role
1	2	3	4	5

(II) Instructions: In questions number 7-10 we are interested in your thoughts about behaviors and actions that are good for the environment vs. behaviors and actions that are harmful to the environment. Please write your responses in the space provided.

7. What are the **best things** an individual can do in order to 'be good to the environment' (i.e. protect the environment, live more sustainably, etc.)?

1
2
3
4
5

8. What are the things that **you do** most frequently to be 'good to the environment'?

1
2
3
4
5

9. What are the things an individual can do that are **harmful** to the environment?

    1
    2
    3
    4
    5

10. What are the things that **you do** most frequently that are harmful to the environment?

    1
    2
    3
    4
    5

11. Please list the things that you feel **restrict your ability** to be good to the environment.

    1
    2
    3
    4
    5

12. Please list any things that you do to be 'good to the environment', that most other people would not think to do.

    1
    2
    3
    4
    5

(III) Instructions: In questions 13-18 we are interested in the interactions you have with the natural environment. Please indicate your response by circling the appropriate number.

13. In the last year, how often would you say you participate in activities or actions (Work, recreational, or otherwise) that involve direct interaction with the natural environment?

Very Seldom									Very Often
1	2	3	4	5	6	7	8	9	10

14. How much would you miss these activities if you were no longer able to do them?

Not At All									A Great Deal
1	2	3	4	5	6	7	8	9	10

15. How often would you say you participated in activities or actions (Work, recreational, or otherwise) that involved direct interaction with the natural environment *while you were growing up*?

Very Seldom									Very Often
1	2	3	4	5	6	7	8	9	10

16. In thinking about the future, how often do you think you will participate in activities or actions (Work, recreational, or otherwise) that involve direct interaction with the natural environment?

Very Seldom									Very Often
1	2	3	4	5	6	7	8	9	10

17. How large of a role do these activities play in the ideal person you strive to be?

Small Role				Large Role
1	2	3	4	5

18. How many hours per week do you spend participating in activities or actions (Work, recreational, or otherwise) that involve direct interaction with the natural environment?

0	1-3	4-6	7-9	More than 9

(IV) Instructions: In questions 19 – 21 we are interested in your thoughts about environmental problems. Please write your response in the space provided, or circling the appropriate number.

19. Please list what you think is the most pressing environmental problem in need of attention.

    1.
    2.
    3.
    4.
    5.

20. To what extent do you feel like your behavioral choices and actions contribute to environmental problems?

Very Little									Very Much
1	2	3	4	5	6	7	8	9	10

21. Would you say that you have a lot or little the ability to help minimize environmental problems?

Very Little									Very Much
1	2	3	4	5	6	7	8	9	10

(V) Instructions: In this last section we are interested in finding out some basic demographic information about you. Please indicate your response by circling the appropriate number

22. In which of these groups did your total family income fall last year?
    1. Less than $10,000
    2. $10,001 – $20,000
    3. $20,001 - $40,000
    4. $40,001 - $60,000
    5. $60,001 - $80,000
    6. $80,001 - $100,000
    7. Over $100,000

23. Are you currently enrolled at the University of Tennessee as a full-time student?

    1 = Yes 2 = No

24. What is the highest level of education you completed?
    1. Some highschool
    2. High school diploma or GED
    3. Some college/technical school
    4. Associates degree
    5. Bachelor's degree
    6. Master's degree
    7. Higher than Master's degree

25. What ethnicity or race do you primarily identify yourself as?
    1. Black
    2. White
    3. Hispanic
    4. American Indian
    5. Asian
    6. Pacific Islander
    7. Mixed Race or Ethnicity
    8. Other

26. Please indicate your gender. 1 = Female 2 = Male

27. Are you currently a member of an environmental organization? 1 = Yes 2 = No

28. How long have you been a member of an environmental organization?

29. What is your current age?

30. Would you be willing to participate in an online survey that will be developed from the information you provided in this focus group session?
    1 = Yes 2 = No

    If yes please provide and email address where we may reach you:

    _____

Thank you very much for helping us with this important project. We realize that you may have other comments or opinions that you weren't able to express in the focus group meeting or in this questionnaire. We invite you to write ANY comments you have in the space below or on the back of this page.

Focus group informed consent

Consent of Participation in the study of Self, Society, and Nature: The Development of an Ecological Identity Scale.

INTRODUCTION

This consent form describes the "Self, Society, and Nature" study, and what you may expect if you decide to participate. You are encouraged to read this consent form carefully and to ask the person who gave it to you any questions you may have before making your decision.

You are invited to participate in this study which examines people's perceptions of the environment and the types of behaviors they may engage in to help ameliorate environmental problems. The study is being conducted by Tobin Walton a PhD. candidate in the department of sociology at the University of Tennessee, under the guidance of Dr. Robert E. Jones. This study is the first part of a larger dissertation project that will develop a multi-item scale that measures people's identity in relation to the environment. Identity is a social psychological concept that can be understood as, "who we think we are", in relation to others. The items will be tested using a random sample of UT undergraduate students. The culmination of the project then will be a valid and reliable ecological identity scale that taps into the meanings people attach to themselves, the environment, and the interactions they share. This research will be valuable to both academics and policy makers alike, as it will further our understanding of the social psychological antecedents of pro (and anti) environmental behavior which in turn can provide insight into the potential for policy of program support among targeted populations.

INFORMATION ABOUT PARTICIPANTS' INVOLVMENT IN THE STUDY

You have been invited to participate in this first part of the study because you are an individual who likely has knowledge, experience or views about the environment, environmental problems, or pro (and anti) environmental behaviors. In this first part of the study, you are invited to participate in a small group meeting which will last 1 ½ hours where we will discuss these topics. The meeting will begin by you completing a small questionnaire. Then, as a group, we will discuss a series of questions. This method of gathering information first through small group meetings is expected to improve the construction of the final scale, by reducing the reliance on the investigator's own understanding of the research topic and instead basing it on information gathered from individuals with

knowledge and opinions on the subject. The information that you can provide us is vital to successfully fulfilling the project objectives.

Within these small group meetings, we are particularly interested in the following:

1) The types and frequency of interactions you have with the environment.
2) The types of behaviors that you feel are protective to or detrimental to the environment.
3) The extent to which “who you are” is related to the environment.
4) Your general & specific beliefs and values about the environment/environmental problems.

_____ Participant's initials

The meeting will be audio-taped but no reference will be made in oral or written reports that could directly link you to the study. The meeting will be audio-taped but no reference will be made in oral or written reports that could directly link you to the study. The names and other possible information that could help identify a participant will not be used in any written transcript, scholarly or public presentation or forum, published article, or any other materials produced by this study without expressed written permission of the participant. The audio-tapes and any other information generated from the meetings will be stored and secured in the home office of the principle investigator (Tobin Walton). The tapes will be transcribed without the names of the participants and both the tapes and the transcriptions will be destroyed in five years after the completion of the project. If an individual withdraws from a meeting before it is completed, any record of information obtained from his or her participation will also be destroyed. You may use your first name, last name, first and last name, a nickname or a fictitious name during the meeting. Regardless of this designation, you will be randomly assigned a fictitious name by the investigators after the meeting to ensure confidentiality. There are several additional steps that are being taken to decrease any potential breach of confidentiality. Information you provide will be identified with a numeric code only for the purposes of data analysis. This information will be kept separate from any personal information obtained in the study. Only the researchers will have access to participant’s personal information and this information will be placed under lock and key at a designated site. However, these measures cannot fully guarantee confidentiality in the meetings since some participants may choose to tell others after the meeting what was discussed and by whom. In order to decrease this potential breach of confidentiality, you will be asked to sign a pledge of confidentiality.

RISKS

There are no reasonably foreseeable risks to individuals participating in these meetings.

BENEFITS

As stated above, these meetings are the first phase of a larger research project. The culmination of the project will be a valid and reliable ecological identity scale that taps into the meanings people attach to themselves, the environment, and the interactions they share. Your role, should you choose to participate in these meetings, is a vital part to the overall project for it is seldom that sociological researchers talk directly to organization members and volunteers about their beliefs and attitudes regarding the environment. This research will be valuable to both academics and policy makers alike, as it will further our understanding of the social psychological antecedents of pro (and anti) environmental behavior which in turn can provide insight into the potential for policy of program support among targeted populations.

_____ Participant's initials

CONFIDENTIALITY

The University of Tennessee and project researchers will do everything in their power to prevent public disclosure or any personal information associated with the subjects. All electronic or printed information obtained in this study will be kept confidential and securely stored in a password protected computer and under lock and key in a designated place.

COMPENSATION

You will be provided refreshments prior, during, and directly after each meeting. As appreciation for your time and effort you will also be given a $15 gift certificate to a locally owned Knoxville area restaurant.

CONTACT INFORMATION

If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Tobin Walton at:

The University of Tennessee
Department of Sociology
901 McClung Tower
Knoxville TN, 37996
865-974-6021

If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-3466.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you have the option to not answer any of the questions asked during this meeting and you may withdraw from the meeting at anytime without penalty and without loss of benefits. If you withdraw from the study before data collection is completed your data will be returned to you or destroyed.

CONSENT

I have read the above information. I have received a copy of this form. I agree to participate in this study.

Participants signature: _____

Date: _____

Pretest Questionnaire

Q1Stud 1. Are you currently enrolled at the University of Tennessee as a full-time undergraduate student?
- ❍ Yes - Undergraduate Student
- ❍ No

Q2Year 2. Which of the following best represents your current status?
- ❍ Freshman
- ❍ Sophomore
- ❍ Junior
- ❍ Senior

Q3Major Do you currently have a major field of study?
- ❍ Yes
- ❍ No

Q4MajorID Please select your major from the list below.
- ❍ Accounting
- ❍ Agriculture
- ❍ Animal Science
- ❍ Anthropology
- ❍ Architecture
- ❍ Art
- ❍ Business Administration
- ❍ Biological Sciences
- ❍ Chemistry
- ❍ Child & Family Studies
- ❍ Classics
- ❍ Communications
- ❍ Environmental & Soil Sciences
- ❍ Economics
- ❍ Education
- ❍ English
- ❍ Engineering
- ❍ Finance
- ❍ Food Science
- ❍ Forestry
- ❍ Geography
- ❍ Geology and Environmental Studies
- ❍ History
- ❍ Human Resource Management
- ❍ Materials Science and Engineering
- ❍ Mathematics
- ❍ Modern Foreign Languages

- ❍ Music
- ❍ Nursing
- ❍ Physics
- ❍ Plant Sciences
- ❍ Political Science
- ❍ Pre-Professional Programs
- ❍ Psychology
- ❍ Religious Studies
- ❍ Retail and Consumer Science
- ❍ Social Work
- ❍ Sociology
- ❍ Statistics
- ❍ Sustainability
- ❍ Wildlife & Fisheries Management
- ❍ Women's Studies
- ❍ Other

Q5EnvMaj Are you completing an environmental or sustainability concentration within your major?
- ❍ Yes
- ❍ No

Q6Age What is your current age?

Q7Memb Do you currently belong to a group or organization who's main goal is to protect or preserve the environment and species in it?
- ❍ Yes
- ❍ No

Q8groupid Please indicate which of the following groups you are a member of. (If you are a member of more than one please indicate the group that you are most active in).
- ❍ SPEAK
- ❍ Eco-Vols
- ❍ Project V.E.G.G.I.E
- ❍ Net-Impact
- ❍ Students for Responsible Investment
- ❍ Other (Please Specify the Name of the Group) _____

Q9LngthMmb How long have you been a member of this group?
- ❍ Less than 1 year
- ❍ 1 to 2 years
- ❍ 2 to 3 years
- ❍ 3 to 4years
- ❍ More than 4

Q10GEB1 Next, we would like to know how frequently you do the following things when you have the opportunity to:
Decrease your overall energy and resource use?
1 Rarely - I do it less than 20% of the times I have the opportunity.
2 Sometimes - I do it between 20 and 40% of the times I have the opportunity.
3 Frequently - I do it between 40 and 60% of the times I have the opportunity
4 Usually - I do it between 60 and 80% of the times I have the opportunity.
5 Almost Always - I do it more than 80% of the times I have the opportunity.

	Rarely	Sometimes	Frequently	Usually	Almost Always
Reducing my overall purchases and use of products and materials	❍	❍	❍	❍	❍
Reusing products and materials as long as I can	❍	❍	❍	❍	❍
Repairing or properly maintaining the things I use or own	❍	❍	❍	❍	❍
Recycling the things I use or own.	❍	❍	❍	❍	❍
Using less energy for heating, cooling and electricity	❍	❍	❍	❍	❍
Using motor vehicles that are more energy efficient.	❍	❍	❍	❍	❍

Q11GEB1b Continued: How frequently you do the following things when you have the opportunity to:
Decrease your overall energy and resource use?
1 Rarely - I do it less than 20% of the times I have the opportunity.
2 Sometimes - I do it between 20 and 40% of the times I have the opportunity.
3 Frequently - I do it between 40 and 60% of the times I have the opportunity
4 Usually - I do it between 60 and 80% of the times I have the opportunity.
5 Almost Always - I do it more than 80% of the times I have the opportunity.

	Rarely	Sometimes	Frequently	Usually	Almost Always
Driving motor vehicles less.	❍	❍	❍	❍	❍
Walking, bicycling or using public transport and carpools.	❍	❍	❍	❍	❍
Buying or using products and materials that take less energy and resources to produce and distribute.	❍	❍	❍	❍	❍
Buying or consuming food and beverages that take less energy and resources to produce and distribute.	❍	❍	❍	❍	❍
Buying or using energy efficient products and materials	❍	❍	❍	❍	❍

Q12GEB 2 In general, how frequently do you do the kinds of things just listed in order to.... Decrease your overall energy and resource use?

- ❍ Rarely - I do them less than 20% of the times I have the opportunity
- ❍ Sometimes - I do them between 20 and 40% of the times I have the opportunity.
- ❍ Frequently - I do them between 40 and 60% of the times I have the opportunity.
- ❍ Usually - I do them between 60 and 80% of the times I have the opportunity.
- ❍ Almost Always - I do them more than 80% of the times I have the opportunity.

Q13GEB 3 And how frequently will you do these kinds of things over the next three months to.... Decrease your overall energy and resource use?

- ❍ Rarely - I will do them less than 20% of the times I have the opportunity
- ❍ Sometimes - I will do them between 20 and 40% of the times I have the opportunity.
- ❍ Frequently - I will do them between 40 and 60% of the times I have the opportunity.
- ❍ Usually - I will do them between 60 and 80% of the times I have the opportunity.
- ❍ Almost Always - I will do them more than 80% of the times I have the opportunity.

Q14GEB 4 Next, we would like to know how frequently you do the following things when you have the opportunity to:
Decrease your overall impact on nature, the environment and others?
1 Rarely - I do it less than 20% of the times I have the opportunity.
2 Sometimes - I do it between 20 and 40% of the times I have the opportunity.
3 Frequently - I do it between 40 and 60% of the times I have the opportunity
4 Usually - I do it between 60 and 80% of the times I have the opportunity.
5 Almost Always - I do it more than 80% of the times I have the opportunity.

	Rarely	Sometimes	Frequently	Usually	Almost Always
Reducing my overall purchases and use of products and materials	❍	❍	❍	❍	❍
Reusing products and materials as long as I can	❍	❍	❍	❍	❍
Repairing or properly maintaining the things I use or own	❍	❍	❍	❍	❍
Recycling the things I use or own.	❍	❍	❍	❍	❍
Using less energy for heating, cooling and electricity	❍	❍	❍	❍	❍
Using motor vehicles that are more energy efficient.	❍	❍	❍	❍	❍

Q15GEB4b Continued: ...how frequently you do the following things when you have the opportunity to:
Decrease your overall impact on nature, the environment and others?
1 Rarely - I do it less than 20% of the times I have the opportunity.
2 Sometimes - I do it between 20 and 40% of the times I have the opportunity.
3 Frequently - I do it between 40 and 60% of the times I have the opportunity
4 Usually - I do it between 60 and 80% of the times I have the opportunity.
5 Almost Always - I do it more than 80% of the times I have the opportunity.

	Rarely	Sometimes	Frequently	Usually	Almost Always
Driving motor vehicles less.	❍	❍	❍	❍	❍
Walking, bicycling or using public transport and carpools.	❍	❍	❍	❍	❍
Buying or using products and materials that take less energy and resources to produce and distribute.	❍	❍	❍	❍	❍
Buying or consuming food and beverages that take less energy and resources to produce and distribute.	❍	❍	❍	❍	❍
Buying or using energy efficient products and materials.	❍	❍	❍	❍	❍

Q16GEB 5 In general, how frequently do you do (these kinds of) things to.... Decrease your overall impact on nature, the environment, or others?

- ❍ Rarely - I do them less than 20% of the times I have the opportunity
- ❍ Sometimes - I do them between 20 and 40% of the times I have the opportunity.
- ❍ Frequently - I do them between 40 and 60% of the times I have the opportunity.
- ❍ Usually - I do them between 60 and 80% of the times I have the opportunity.
- ❍ Almost Always - I do them more than 80% of the times I have the opportunity.

Q17GEB6 In general, how frequently will you do (these kinds of) things over the next three months to.... Decrease your overall impact on nature, the environment, or others?

- ❍ Rarely - I do them less than 20% of the times I have the opportunity
- ❍ Sometimes - I do them between 20 and 40% of the times I have the opportunity.
- ❍ Frequently - I do them between 40 and 60% of the times I have the opportunity.
- ❍ Usually - I do them between 60 and 80% of the times I have the opportunity.
- ❍ Almost Always - I do them more than 80% of the times I have the opportunity.

Q18GEB 7 Next, we would like to know how frequently you do the following things when you have the opportunity to:
Increase or improve your understanding of nature and the environment
1 Rarely - I do it less than 20% of the times I have the opportunity.
2 Sometimes - I do it between 20 and 40% of the times I have the opportunity.
3 Frequently - I do it between 40 and 60% of the times I have the opportunity
4 Usually - I do it between 60 and 80% of the times I have the opportunity.
5 Almost Always - I do it more than 80% of the times I have the opportunity

	Rarely	Sometimes	Frequently	Usually	Almost Always
Learning more about how my actions and the actions of others impact the environment and the future.	❍	❍	❍	❍	❍
Learning more about how and where our food, goods, energy, and wastes are produced and distributed.	❍	❍	❍	❍	❍
Learning more about how to decrease my overall impact on the environment and others.	❍	❍	❍	❍	❍
Learning more about how to restore and maintain the health and quality of the environment.	❍	❍	❍	❍	❍
Learning more about myself and my connection with wildlife, nature and the environment.	❍	❍	❍	❍	❍

Q19GEB8 Next we would like to know if you do or have done the following things to help: Support or defend environmental protection

	YES	NO
Wrote letters to the editor, signed a petition, blogged tweeted or used facebook.	❍	❍
Spoke at public meetings or gatherings.	❍	❍
Contributed resources or time to environmental groups and projects.	❍	❍
Supported pro-environmental candidates or elected public officials.	❍	❍
Participated in on-site visits, projects, programs, protests or events.	❍	❍
Encouraged your family, friends, or others to get involved in efforts to protect the environment.	❍	❍

Q20Inc 9. What would be your best estimate of your family income (father's, mother's/caregiver's) in 2013?

❍ Less than $10,000
❍ $10,001 – $20,000
❍ $20,001 - $40,000
❍ $40,001 - $60,000
❍ $60,001 - $80,000
❍ $80,001 - $100,000
❍ Over $100,000
❍ Don't Know

Q20Race 12. Which of the following best describes your race/ethnicity? Check as many as apply.

- ❑ Black
- ❑ White
- ❑ Hispanic
- ❑ American Indian
- ❑ Asian
- ❑ Pacific Islander
- ❑ Mixed Race or Ethnicity
- ❑ Other

Q21Sex 13. What is your sex?

- ❍ Female
- ❍ Male

Student Survey

Q2 1. Are you currently enrolled at the University of Tennessee as a full-time undergraduate student?

❍ Yes
❍ No

Q4 Listed Below are things that people may or may not be concerned about. Please indicate your level of concern.

	Not at all concerned	Slightly concerned	Somewhat concerned	Moderately concerned	Extremely concerned
Climate Change and Global Warming	❍	❍	❍	❍	❍
Energy production, distribution and consumption	❍	❍	❍	❍	❍
Habitat degradation, destruction or loss of biodiversity	❍	❍	❍	❍	❍
Food production, distribution and consumption	❍	❍	❍	❍	❍
Water quality and availability	❍	❍	❍	❍	❍

Q98 Again, below are things that people may or may not be concerned about. Please indicate your level of concern.

	Not at all concerned	Slightly concerned	Somewhat concerned	Moderately concerned	Extremely concerned
Population growth and development	❍	❍	❍	❍	❍
Urban growth and development	❍	❍	❍	❍	❍
Fossil fuel technologies, power production, use and wastes	❍	❍	❍	❍	❍
Nuclear technologies, power production use and wastes	❍	❍	❍	❍	❍
Household garbage and wastes	❍	❍	❍	❍	❍

Q6 Have you taken or are you currently enrolled in a course or major that examines natural resource, wildlife or environmental issues?

❍ Yes
❍ No

Q8 Do you currently belong to a group or organization who's main goal is to protect or preserve the environment and species in it?

❍ Yes
❍ No

Q10 Please indicate your level of agreement with the following statements.

	Strongly Agree	Mildly Agree	Unsure	Mildly Disagree	Strongly Disagree
We are approaching the limit of the number of people the earth can support.	❍	❍	❍	❍	❍
Humans have the right to modify the natural environment to suit their needs.	❍	❍	❍	❍	❍
When humans interfere with nature it often produces disastrous consequences.	❍	❍	❍	❍	❍
Human ingenuity will insure that we do NOT make the earth unlivable.	❍	❍	❍	❍	❍
Humans are severely abusing the environment.	❍	❍	❍	❍	❍

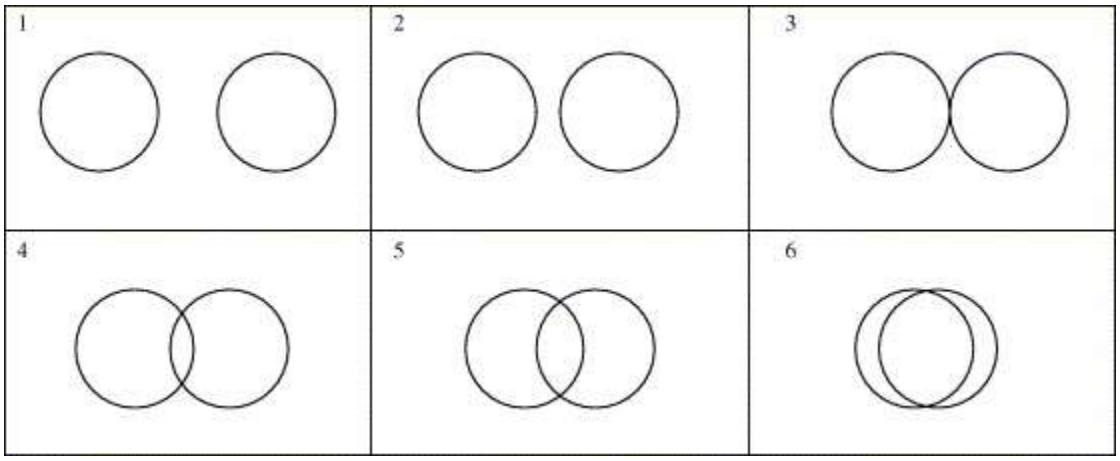
Q99 Again, please indicate your level of agreement with the following statements

	Strongly Agree	Mildly Agree	Unsure	Mildly Disagree	Strongly Disagree
The earth has plenty of natural resources if we just learn how to develop them.	❍	❍	❍	❍	❍
Plants and animals have as much right as humans to exist.	❍	❍	❍	❍	❍
The balance of nature is strong enough to cope with the impacts of modern industrial nations.	❍	❍	❍	❍	❍
Despite our special abilities humans are still subject to the laws of nature.	❍	❍	❍	❍	❍
The so-called "ecological crisis" facing humankind has been greatly exaggerated.	❍	❍	❍	❍	❍

Q12 Continued: Please indicate your level of agreement with the following statements.

	Strongly Agree	Mildly Agree	Unsure	Mildly Disagree	Strongly Disagree
The earth is like a spaceship with very limited room and resources.	❍	❍	❍	❍	❍
Humans were meant to rule over the rest of nature.	❍	❍	❍	❍	❍
The balance of nature is very delicate and easily upset.	❍	❍	❍	❍	❍
Humans will eventually learn enough about how nature works to be able to control it.	❍	❍	❍	❍	❍
If things continue on their present course, we will soon experience a major ecological catastrophe.	❍	❍	❍	❍	❍
Nature has a personal, symbolic or spiritual meaning form me.	❍	❍	❍	❍	❍

Q16 In each of the boxes below (1-6), assume one of the circles represents yourself, and the other represents nature and the biophysical environment. Please click on the box that most accurately represents how you see yourself in relation to nature and the biophysical environment.



Q20 The next set of questions asks you about how you view yourself in relation to nature, the environment and other species. Please indicate the extent you agree or disagree with each of following statements: "I am someone who..."

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Is aware of and cares about my impact on the environment	❍	❍	❍	❍	❍
Is strongly connected to nature and the environment	❍	❍	❍	❍	❍
Is a protector/nurturer of wildlife and their	❍	❍	❍	❍	❍

habitats					
Others view as being an environmentalist	❍	❍	❍	❍	❍
Views myself as an environmentalist	❍	❍	❍	❍	❍
Is trying to be a better environmentalist	❍	❍	❍	❍	❍

Q24 The next set of questions asks you about how you view humans in relation to nature, the environment and other species. Please indicate the extent you agree or disagree with each of the following statements: "We are..."

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Similar to other animals in our biology, basic needs and drives	❍	❍	❍	❍	❍
A part of nature	❍	❍	❍	❍	❍
Separated from nature because of the way we live	❍	❍	❍	❍	❍

Q26 Again, please indicate the extent you agree or disagree with each of the following statements: "We are different from other animals..."

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Because of our knowledge, technology, and organization	❍	❍	❍	❍	❍
Because of the amount of resources we consume	❍	❍	❍	❍	❍

Q30 Again, please indicate the extent you agree or disagree with each of the following statements: "I identify with people who..."

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Make significant changes in their lifestyle for environmental reasons	❍	❍	❍	❍	❍
Focus their life on improving and protecting the environment	❍	❍	❍	❍	❍
Are more interested in making money than in other things	❍	❍	❍	❍	❍
Feel they have the right to consume as much as they want	❍	❍	❍	❍	❍

Don't care about their environmental impacts	❍	❍	❍	❍	❍
Doubt global warming is happening	❍	❍	❍	❍	❍
Doubt global warming is mostly caused by humans	❍	❍	❍	❍	❍

Q32 Again, please indicate the extent you agree or disagree with each of the following statements: "I identify with..."

	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree
Most Republicans and Conservatives	❍	❍	❍	❍	❍
Most Democrats and Liberals	❍	❍	❍	❍	❍
Groups that promote business interests	❍	❍	❍	❍	❍
Big business and corporations	❍	❍	❍	❍	❍
Small locally owned businesses	❍	❍	❍	❍	❍
The typical American consumer	❍	❍	❍	❍	❍
Capitalism and the free-market system	❍	❍	❍	❍	❍

Q36 How likely are you to discuss wildlife, nature or environmental issues with each of the following people?

	Very Unlikely	Unlikely	Neither Likely no Unlikely	Likely	Very Likely
Classmates or Co-workers	❍	❍	❍	❍	❍
My friends	❍	❍	❍	❍	❍
My family	❍	❍	❍	❍	❍

Q38 How close are you to people that want to protect and preserve the environment?
- ❍ Not at all close
- ❍ Slightly close
- ❍ Somewhat close
- ❍ Moderately close
- ❍ Extremely close

Q85 Would you say that people who strongly identify themselves with nature and the environment are...
- ❍ Very wise
- ❍ Wise
- ❍ Neither
- ❍ Foolish
- ❍ Very Foolish

Q87 Would you say that people who strongly identify themselves with nature and the environment are...
- ❍ Very important
- ❍ Important
- ❍ Neither important or unimportant
- ❍ Unimportant
- ❍ Very Unimportant

Q40 How much of a role does protecting and preserving the environment play in your life ?
- ❍ No role
- ❍ Minor role
- ❍ A moderate role
- ❍ A large role
- ❍ A very large role

Q42 In the last year, how frequently did you do things in settings that are closer to nature or the environment?

- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Frequently
- ❍ A great deal

Q48 How large of a role do these activities or actions play in the ideal person you strive to be?

- ❍ Small Role 1
- ❍ 2
- ❍ 3
- ❍ 4
- ❍ Large Role 5

Q100 In thinking about the future, how frequently will you do things in settings that are closer to nature or the environment?

- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Frequently
- ❍ A great deal

Q50 Next, we would like to know how frequently you do the following things when you have the opportunity to: Increase or improve your understanding of nature and the environment 1 Rarely - I do it less than 20% of the times I have the opportunity. 2 Sometimes - I do it between 20 and 40% of the times I have the opportunity. 3 Frequently - I do it between 40 and 60% of the times I have the opportunity 4 Usually - I do it between 60 and 80% of the times I have the opportunity. 5 Almost Always - I do it more than 80% of the times I have the opportunity.

	Rarely	Sometimes	Frequently	Usually	Almost Always
Learning more about how my actions and the actions of others impact the environment and the future.	❍	❍	❍	❍	❍
Learning more about how and where our food, goods, energy, and wastes are produced and distributed.	❍	❍	❍	❍	❍
Learning more about myself and my connection with wildlife, nature and the environment.	❍	❍	❍	❍	❍

Q52 Next, we would like to know how frequently you do the following things when you have the opportunity to: Decrease your overall energy/resource use, and impact on the environment and others? 1 Rarely - I do it less than 20% of the time I have the opportunity. 2 Sometimes - I do it between 20 and 40% of the time I have the opportunity. 3 Frequently - I do it between 40 and 60% of the time I have the opportunity. 4 Usually - I do it between 60 and 80% of the time I have the opportunity. 5 Almost Always - I do it more than 80% of the time I have the opportunity.

	Rarely	Sometimes	Frequently	Usually	Almost Always
Reducing my overall purchases and use of products and materials	❍	❍	❍	❍	❍
Reusing products and materials as long as I can	❍	❍	❍	❍	❍
Repairing or properly maintaining the things I use or own	❍	❍	❍	❍	❍
Recycling the things I use or own	❍	❍	❍	❍	❍
Buying or consuming food and beverages that take less energy and resources to produce and distribute	❍	❍	❍	❍	❍
Buying or using products that take less energy/resources to produce and distribute	❍	❍	❍	❍	❍

Q53 Cont'd

	Rarely	Sometimes	Frequently	Usually	Almost Always
Buying or using energy efficient products and materials	❍	❍	❍	❍	❍
Using motor vehicles that are more energy efficient	❍	❍	❍	❍	❍
Driving motor vehicles less	❍	❍	❍	❍	❍
Walking, bicycling or using public transport and carpools	❍	❍	❍	❍	❍
Using less energy for heating, cooling and electricity	❍	❍	❍	❍	❍

Q56 Overall, how frequently do you do things to... Decrease your overall energy/resource use?

❍ Rarely - I do things less than 20% of the times I have the opportunity
❍ Sometimes - I do things between 20 and 40% of the times I have the opportunity.
❍ Frequently - I do things between 40 and 60% of the times I have the opportunity.
❍ Usually - I do things between 60 and 80% of the times I have the opportunity.
❍ Almost Always - I do things more than 80% of the times I have the opportunity

Q58 ...and how frequently do you intend to do things over the next three months to... Decrease your overall energy and resource use?

❍ Rarely - I will do things less than 20% of the times I have the opportunity
❍ Sometimes - I will do things between 20 and 40% of the times I have the opportunity.
❍ Frequently - I will do things between 40 and 60% of the times I have the opportunity.
❍ Usually - I will do things between 60 and 80% of the times I have the opportunity.
❍ Almost Always - I will do things more than 80% of the times I have the opportunity.

Q60 Most people who are like or important to me, think I should try to decrease my overall energy and resource use.
- ❍ Agree
- ❍ Somewhat Agree
- ❍ Niether Agree nor Disagree
- ❍ Somewhat Disagree
- ❍ Disagree

Q62 Would you say that doing things to decrease your overall energy and resource use is...
- ❍ Very Wise
- ❍ Wise
- ❍ Neither
- ❍ Foolish
- ❍ Very Foolish

Q66 Would you say that doing things to decrease your overall energy and resource use is...
- ❍ Very Important
- ❍ Important
- ❍ Neither Important or Unimportant
- ❍ Unimportant
- ❍ Very Unimportant

Q88 Overall how frequently do you do things to... Decrease your overall impact on nature, the environment, or others?
- ❍ Rarely - I do things less than 20% of the time I have the opportunity
- ❍ Sometimes - I do things between 20 and 40% of the time I have the opportunity
- ❍ Frequently - I do things between 40 and 60% of the time I have the opportunity
- ❍ Usually - I do things between 60 and 80% of the time I have the opportunity
- ❍ Almost always - I do things more than 80% of the time I have the opportunity

Q89 Overall how frequently will you do things over the next three months to... Decrease your overall impact on nature, the environment, or others?
- ❍ Rarely - I do things less than 20% of the time I have the opportunity
- ❍ Sometimes - I do things between 20 and 40% of the time I have the opportunity
- ❍ Frequently - I do things between 40 and 60% of the time I have the opportunity
- ❍ Usually - I do things between 60 and 80% of the time I have the opportunity
- ❍ Almost always - I do things more than 80% of the time I have the opportunity

Q44 Most people who are like or important to me, think I should try to decrease my overall impact on nature, the environment, or others.

- ❍ Agree
- ❍ Somewhat agree
- ❍ Neither agree nor disagree
- ❍ Somewhat disagree
- ❍ Disagree

Q90 Would you say that doing things to decrease your overall impact on nature, the environmental, or others is...

- ❍ Very wise
- ❍ Wise
- ❍ Neither wise nor unwise
- ❍ Foolish
- ❍ Very foolish

Q91 Would you say that doing things to decrease your overall impact on nature, the environmental, or others is...

- ❍ Very important
- ❍ Important
- ❍ Neither important nor unimportant
- ❍ Unimportant
- ❍ Very unimportant

Q70 The following is a list of cultural values. Please rate each in terms their importance as a guiding principle in your life. *Please rate only a few values as extremely important*

	Opposed to my Values	Not Important	Somewhat Important	Important	Extremely Important
Unity with Nature (fitting into nature)	❍	❍	❍	❍	❍
Social Justice (Correcting Injustice/Caring for the Weak	❍	❍	❍	❍	❍
Authority (The right to lead or command)	❍	❍	❍	❍	❍
Wealth (Material possessions)	❍	❍	❍	❍	❍
Equality (Equal 0pportunity for all)	❍	❍	❍	❍	❍
A World at Peace (Free of war and conflict)	❍	❍	❍	❍	❍
Preserving my public image (Protecting my "face")	❍	❍	❍	❍	❍

Q71 Cont'd

	Opposed to my Values	Not Important	Some what Important	Important	Extremely Important
A World of Beauty (Beauty of nature and the arts)	❍	❍	❍	❍	❍
Social Power (Control over others, dominance)	❍	❍	❍	❍	❍
Broadminded (Tolerant of different ideas and beliefs)	❍	❍	❍	❍	❍
Protecting the Environment (Preserving nature)	❍	❍	❍	❍	❍
Wisdom (A mature understanding of life)	❍	❍	❍	❍	❍
Social Recognition (Respect Approval by others)	❍	❍	❍	❍	❍

Q74 Which of the following best represents current status
❍ Freshman
❍ Sophomore
❍ Junior
❍ Senior
❍ Graduate

Q76 Do you have a motor vehicle that you use.
❍ Yes
❍ No

Q78 What is your current age?

Q80 What would be your best estimate of your total household/family income last year (2013)?

- ❍ Under $25,000
- ❍ Between $25,000 and $50,000
- ❍ Between $50,000 and $75,000
- ❍ Between $75,00 - $100,000
- ❍ Over $100,000
- ❍ Don't Know

Q82 How would you classify yourself?

- ❑ Hispanic or Latino
- ❑ Black, African or African American
- ❑ Asian or Asian American
- ❑ Native American, American Indian, Alaskan Native, Eskimo or Inuit
- ❑ Native Hawaiian or Pacific Islander
- ❑ White or Caucasian
- ❑ Mixed Race or Ethnicity
- ❑ Other

Q84 13. How would you classify yourself?

- ❍ Female
- ❍ Male
- ❍ Transgender
- ❍ Other

Scale Construction (Item Analysis)

Ecological Identity Scale (EIS)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.904	.905	29

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
X20_1EIDRRe	95.0337	220.728	.589	.506	.899
X20_2EIDRRe	95.4795	216.869	.546	.575	.899
X20_3EIDRRe	95.7181	217.802	.507	.539	.900
X20_4EIDRRe	96.5422	215.345	.544	.774	.899
X20_5EIDRRe	96.4265	214.110	.569	.796	.899
X20_6EIDRRe	95.4602	214.481	.624	.593	.898
X24_3EIDSRe	94.9422	225.871	.273	.231	.904
X24_4EIDSRe	94.6747	227.394	.244	.245	.904
X26_2EIDSRe	94.7494	227.111	.196	.119	.905
X30_1EIDENVRe	95.7928	215.358	.614	.686	.898
X30_2EIDENVRe	95.8747	216.086	.569	.662	.899
Q30_3EIDOPP	95.4771	220.844	.350	.438	.903
Q30_4EIDOPP	95.0530	216.959	.522	.651	.900
Q30_5EIDOPP	94.9976	217.732	.553	.627	.899
Q30_6EIDOPP	95.3422	215.269	.506	.679	.900
Q30_7EIDOPP	95.4337	214.541	.512	.664	.900
Q32_1EIDOPP	96.0313	217.335	.388	.418	.903
Q32_3EIDOPP	95.9904	218.169	.468	.583	.901
Q32_4EIDOPP	95.5060	217.540	.499	.583	.900
Q32_6EIDOPP	96.4964	224.569	.288	.220	.904
Q32_7EIDOPP	96.5494	223.480	.322	.346	.903
Q36_1EIDSAL	95.8337	218.052	.456	.451	.901
Q36_2EIDSAL	95.4867	215.980	.549	.604	.899
Q36_3EIDSAL	95.5639	217.425	.451	.486	.901
Q38_EIDSAL	96.2313	215.483	.551	.410	.899
Q40EIDPROM	96.5084	220.589	.539	.467	.900
Q42EIDSAL	95.8145	221.852	.410	.591	.902
Q48EIDPROM	96.0241	217.492	.556	.595	.899
Q100	95.5976	219.917	.524	.675	.900

Component Matrix[a]

	Component			
	1	2	3	4
EIS 1	.666	-.216	.077	.173
EIS 2	.645	-.410	-.048	.130
EIS 3	.610	-.432	.050	.073
EIS 4	.642	-.459	.330	-.142
EIS 5	.665	-.440	.310	-.088
EIS 6	.698	-.220	.264	-.022
EIS 7	.295	.074	.191	.439
EIS 8	.272	.076	.057	.588
EIS 11	.214	.104	.147	.218
EIS 12	.689	-.261	.294	.095
EIS 13	.654	-.305	.313	.101
EIS 14	.362	.475	-.258	.126
EIS 15	.522	.565	-.204	.201
EIS 16	.563	.498	-.211	.213
EIS 17	.502	.529	.157	.116
EIS 18	.509	.533	.165	.154
EIS 19	.392	.396	.446	-.125
EIS 20	.458	.493	.254	-.297
EIS 21	.490	.523	.111	-.203
EIS 22	.300	.276	-.030	-.297
EIS 23	.329	.368	.272	-.249
EIS 24	.511	-.018	-.128	-.306
EIS 25	.597	-.006	-.214	-.350
EIS 26	.513	-.062	-.238	-.380
EIS 27	.620	-.105	-.156	-.049
EIS 28	.624	-.223	-.164	.034
EIS 29	.499	-.172	-.612	-.002
EIS 30	.632	-.086	-.414	.064
EIS 31	.592	-.017	-.597	.055

Extraction Method: Principal Component Analysis.

a. 4 components extracted.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.370	28.862	28.862	8.370	28.862	28.862
2	3.381	11.657	40.519	3.381	11.657	40.519
3	2.158	7.443	47.962	2.158	7.443	47.962
4	1.492	5.145	53.107	1.492	5.145	53.107
5	1.418	4.890	57.997			
6	1.111	3.833	61.829			
7	1.054	3.635	65.464			
8	.924	3.185	68.649			
9	.881	3.039	71.688			
10	.791	2.729	74.416			

Extraction Method: Principal Component Analysis.

General Pro-ecological Behavior (GEB)

Reliability Statistics (GEB)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.911	.913	14

Item-Total Statistics (GEB)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q50_1GEBLrn	36.55	112.473	.674	.718	.903
Q50_2GEBLrn	36.34	111.905	.646	.626	.904
Q50_3GEBLrn	36.43	112.258	.658	.649	.904
Q52_1GEBPEB	36.47	112.633	.679	.503	.903
Q52_2GEBPEB	35.70	113.639	.645	.583	.904
Q52_3GEBPEB	35.52	115.304	.584	.527	.906
Q52_4GEBPEB	35.71	114.361	.560	.409	.907
Q52_5GEBPEB	36.65	111.701	.706	.791	.902
Q52_6GEBPEB	36.67	111.754	.748	.819	.901
Q54_1GEBPEB	36.27	110.806	.741	.631	.901
Q54_2GEBPEB	36.67	114.852	.502	.390	.910
Q54_3GEBPEB	36.58	113.941	.545	.557	.908
Q54_4GEBPEB	36.21	115.316	.469	.509	.911
Q54_5GEBPEB	36.12	113.577	.576	.373	.907

Component Matrix (GEB)

	Component		
	1	2	3
Q50_1GEBLrn GEB -	.740	-.460	.216
Q50_2GEBLrn GEB -	.719	-.440	.161
Q50_3GEBLrn GEB	.728	-.424	.178
Q52_1GEBPEB GEB	.741	.048	-.109
Q52_2GEBPEB GEB	.705	.230	-.361
Q52_3GEBPEB GEB	.646	.323	-.401
Q52_4GEBPEB GEB	.629	.203	-.345
Q52_5GEBPEB GEB	.778	-.167	-.105
Q52_6GEBPEB GEB	.812	-.173	-.104
Q54_1GEBPEB GEB	.794	-.030	-.072
Q54_2GEBPEB GEB	.564	.116	.084
Q54_3GEBPEB GEB	.583	.414	.566
Q54_4GEBPEB GEB	.513	.475	.564
Q54_5GEBPEB GEB	.634	.277	-.057

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Total Variance Explained (GEB)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.673	47.665	47.665	6.673	47.665	47.665
2	1.332	9.516	57.181	1.332	9.516	57.181
3	1.202	8.585	65.766	1.202	8.585	65.766
4	.905	6.467	72.233			
5	.777	5.549	77.782			
6	.632	4.518	82.299			
7	.513	3.664	85.964			
8	.471	3.364	89.328			
9	.338	2.413	91.741			
10	.329	2.347	94.088			
11	.272	1.940	96.027			
12	.257	1.835	97.862			
13	.191	1.364	99.226			
14	.108	.774	100.000			

Extraction Method: Principal Component Analysis.

New Ecological Paradigm (NEP)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.826	.827	15

Item-Total Statistics (NEP)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
XQ10_1NEP	49.9692	70.359	.394	.276	.819
Q10_2NEP	50.4189	68.478	.494	.285	.813
XQ10_3NEP	49.7269	70.948	.402	.275	.819
Q10_4NEP	50.5359	71.323	.355	.186	.822
XQ10_5NEP	49.3963	68.861	.568	.409	.809
Q99_1NEP	51.2526	72.811	.268	.141	.827
XQ99_2NEP	49.2895	69.247	.509	.372	.812
Q99_3NEP	50.0123	69.123	.475	.309	.814
XQ99_4NEP	49.2074	74.408	.299	.136	.824
Q99_5NEP	49.9589	66.414	.612	.469	.804
XQ12_1NEP	49.9692	70.306	.418	.293	.818
Q12_2NEP	50.2669	66.114	.497	.352	.813
XQ12_3NEP	49.8460	71.266	.405	.227	.818
Q12_4NEP	50.2649	72.154	.322	.195	.824
XQ12_5NEP	49.7043	67.139	.667	.516	.802

Component Matrix (NEP)

	Component		
	1	2	3
XQ10_1NEP	.495	-.301	.433
Q10_2NEP	.577	.339	-.081
XQ10_3NEP	.515	-.367	-.140
Q10_4NEP	.425	.414	-.131
XQ10_5NEP	.680	-.197	.042
Q99_1NEP	.330	.368	.496
XQ99_2NEP	.615	-.219	-.353
Q99_3NEP	.565	.355	.082
XQ99_4NEP	.375	-.090	-.443
Q99_5NEP	.711	.178	.074
XQ12_1NEP	.511	-.341	.410
Q12_2NEP	.608	.080	-.400
XQ12_3NEP	.505	-.289	.092
Q12_4NEP	.385	.556	.054
XQ12_5NEP	.768	-.158	.025

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Total Variance Explained (NEP)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.562	30.412	30.412	4.562	30.412	30.412
2	1.440	9.600	40.012	1.440	9.600	40.012
3	1.152	7.680	47.692	1.152	7.680	47.692
4	.988	6.589	54.281			
5	.890	5.933	60.213			
6	.864	5.763	65.977			
7	.762	5.083	71.059			
8	.733	4.889	75.948			
9	.663	4.422	80.370			
10	.608	4.051	84.421			
11	.557	3.715	88.136			
12	.530	3.531	91.667			
13	.472	3.149	94.815			
14	.422	2.810	97.626			
15	.356	2.374	100.000			

Extraction Method: Principal Component Analysis.

Self-Transcendent Values (Values Self-Trans)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.854	.855	8

Item-Total Statistics (Values-Self-Trans)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q70_1Values	28.37	20.355	.557	.461	.842
Q70_2Values	27.72	20.733	.571	.379	.840
Q70_5Values	27.58	20.642	.579	.419	.839
Q70_6Values	27.73	20.889	.520	.302	.846
Q72_1Values	28.01	20.180	.613	.448	.835
Q72_3Values	27.59	20.337	.595	.377	.837
Q72_4Values	27.80	19.527	.716	.580	.822
Q72_5Values	27.43	20.959	.625	.430	.834

Component Matrix (Values-Self-Trans)

	Component
	1
Q70_1Values	.636
Q70_2Values	.708
Q70_5Values	.725
Q70_6Values	.660
Q72_1Values	.702
Q72_3Values	.721
Q72_5Values	.728

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Total Variance Explained (Values-Self-Trans)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.410	48.718	48.718	3.410	48.718	48.718
2	.986	14.081	62.799			
3	.665	9.502	72.301			
4	.576	8.235	80.536			
5	.524	7.491	88.026			
6	.430	6.140	94.166			
7	.408	5.834	100.000			

Extraction Method: Principal Component Analysis.

Power Values (Values-Power)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.719	.719	5

Item-Total Statistics (Values-Power)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q70_3Values	11.23	7.225	.420	.212	.693
Q70_4Values	11.63	7.109	.468	.231	.675
Q70_7Values	11.46	6.649	.544	.325	.644
Q72_2Values	12.13	6.992	.503	.267	.661
Q72_6Values	11.07	6.803	.454	.262	.682

Component Matrix (Values-Power)

	Component
	1
Q70_3Values	.632
Q70_4Values	.679
Q70_7Values	.744
Q72_2Values	.708
Q72_6Values	.669

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Total Variance Explained (Values-Power)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.362	47.231	47.231	2.362	47.231	47.231
2	.866	17.325	64.555			
3	.692	13.836	78.391			
4	.598	11.968	90.359			
5	.482	9.641	100.000			

Extraction Method: Principal Component Analysis.

Environmental Concern (EnvConcern)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.912	.913	10

Item-Total Statistics (EnvConcern)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q4_1GenConc	32.17	61.528	.683	.499	.903
Q4_2GenConc	31.84	63.220	.688	.526	.903
Q4_3GenConc	31.70	63.358	.657	.463	.905
Q4_4GenConc	31.89	62.751	.650	.545	.905
Q4_5GenConc	31.86	61.964	.651	.545	.905
Q98_1GenConc	32.18	61.427	.656	.577	.905
Q98_2GenConc	32.26	61.800	.679	.588	.904
Q98_3GenConc	31.81	61.002	.765	.625	.899
Q98_4GenConc	32.21	60.957	.669	.496	.904
Q98_5GenConc	32.26	60.666	.711	.528	.902

Component Matrix (EnvConcern)

	Component 1
Q4_1GenConc	.752
Q4_2GenConc	.757
Q4_3GenConc	.730
Q4_4GenConc	.719
Q4_5GenConc	.721
Q98_1GenConc	.727
Q98_2GenConc	.744
Q98_3GenConc	.824
Q98_4GenConc	.742
Q98_5GenConc	.777

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Total Variance Explained (EnvConcern)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.621	56.210	56.210	5.621	56.210	56.210
2	.838	8.380	64.590			
3	.773	7.731	72.320			
4	.593	5.926	78.247			
5	.510	5.099	83.345			
6	.430	4.298	87.643			
7	.394	3.941	91.584			
8	.301	3.011	94.595			
9	.285	2.848	97.443			
10	.256	2.557	100.000			

Extraction Method: Principal Component Analysis.

Environmental Attitude (Env. Attitude)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.879	.882	6

Item-Total Statistics (Env. Attitude)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
X85ATTENV	21.1318	8.098	.587	.444	.876
X87ATTENV	20.9331	8.323	.563	.435	.879
X62ATTGEBUse	20.6491	8.098	.743	.701	.850
X66ATTGEBUse	20.6004	8.118	.739	.665	.851
X90ATTGEBIMP	20.7039	7.628	.761	.782	.845
X91ATTGEBIMP	20.6775	7.666	.756	.756	.846

Component Matrix (Env. Attitude)

	Component
	1
X85ATTENV	.685
X87ATTENV	.662
X62ATTGEBUse	.846
X66ATTGEBUse	.842
X90ATTGEBIMP	.862
X91ATTGEBIMP	.855

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Total Variance Explained (Env. Attitude)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.808	63.468	63.468	3.808	63.468	63.468
2	.937	15.617	79.085			
3	.451	7.518	86.603			
4	.395	6.587	93.190			
5	.299	4.990	98.180			
6	.109	1.820	100.000			

Extraction Method: Principal Component Analysis.

Environmental Norm (Env. Norm)

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.837	.837	2

Item-Total Statistics (Env. Norm)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
X60NormGEBUse	3.1296	1.050	.720	.519	.
X44NormGEBIMP	3.0749	1.035	.720	.519	.

Component Matrix (Env. Norm)

	Component
	1
X60NormGEBUse	.927
X44NormGEBIMP	.927

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Total Variance Explained (Env. Norm)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.720	86.015	86.015	1.720	86.015	86.015
2	.280	13.985	100.000			

Extraction Method: Principal Component Analysis.

VITA

Tobin N. Walton was born in Milwaukee, Wisconsin to the parents of Wymond and Beverly Walton. He is the youngest of four children. He was introduced to the field of Sociology at the University of Evansville (IN), where he earned a Bachelors of Science degree in 1997. He went on to earn a second undergraduate degree in Social Science Teaching, and taught high school for five years in Boise Idaho. Tobin graduated with a PhD. in Environmental Sociology in August 2014. He looks forward to teaching, researching and spending time with his wife and four boys.