

Researching and Communicating Environmental Issues Among Farmers and Ranchers: Implications for Extension Outreach

Abstract

The research reported here explored environmental terminology and scale use with farmers/ranchers, and the article provides tips for Extension educators in communicating with these audiences. Following analysis and critique of various environmental scales by six cattle ranchers, a revised environmental scale was developed and tested as a predictor of conservation behavior. A mail survey was administered to 1,000 ranchers, and a 60.2% response-rate was received. Results offer recommendations in measuring environmental identity as well as insight to perceptions of terminology related to environmental issues by farmers/ranchers.

Roslynn G. Brain
Assistant Professor,
Sustainable
Communities
Extension Specialist
Utah State University
Logan, Utah
roslynn.brain@usu.edu
[u](#)

Tracy A. Irani
Professor
Agricultural Education
and Communication
University of Florida
Gainesville, Florida
irani@ufl.edu

Martha C. Monroe
Professor
Environmental
Education and
Extension
University of Florida.
Gainesville, Florida
mcmonroe@ufl.edu

Introduction

Farmers and ranchers are an important target audience in Extension; however, when communicating with this audience on conservation issues, many communication barriers can arise. The communication gap between those researching environmental behaviors or administering environmental programs and farmer/rancher audiences in Extension programming is well documented (Monroe, Bowers, & Hermansen, 2003; Natural Resources Conservation Service, 2003; Rilla & Sokolow, 2000). Breetz, Fisher-Vanden, Jacobs, and Schary (2005) found the key factors contributing to slow adoption of water conservation programs delivered through Extension were trust and communication barriers between farmers and program administrators. These barriers significantly reduced involvement in such programs despite direct financial incentives available. In the research arena, similar communication barriers between researchers and farm/ranch participants can result in measurement error and biased research.

This article explores the applicability and power of environmental identity (EID) scales to predict farmer/rancher engagement in conservation easement (CE) agreements. Objectives included:

1. Determine the most applicable EID scale and wording to use with farmers/ranchers.
2. Test the ability of a redesigned EID scale to predict engagement in a CE agreement.

Theoretical Framework

To predict engagement in a CE agreement (objective 2), EID was tested as an antecedent independent variable to the variables within the theory of planned behavior (Ajzen, 1991). According to Clayton and Opatow (2003), environmental scholarship has not given enough consideration to the relationship between identity and a connection to the natural environment. As a result, they developed a 24-item EID scale to detect whether individual differences in EID can predict behavior.

When tested among 73 students to predict behavior, Clayton and Opatow's (2003) EID scale was highly correlated with environmental behaviors ($r = 0.64$). This analysis controlled for other variables in the model, including environmental attitudes (measured via an Environmental Attitudes Scale developed by Thompson & Barton, 1994), universal human values (as identified by Schwartz, 1992), and individualism and collectivism variables (as identified by Triandis, 1995). Clayton and Opatow (2003) define EID as a way in which individuals form their self-concept:

a sense of connection to some part of the nonhuman natural environment, based on history, emotional attachment, and/or similarity, that affect 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" (pp. 45-46).

Thus, they perceive EID as the way in which individuals orient themselves to the natural world.

In an earlier work, Weigert (1997) defined EID as the "experienced social understandings of who we are in relation to, and how we interact with, the natural environment" (p. 159). Stets and Biga (2003) define EID as "the meanings that one attributes to the self as they relate to the environment" (p. 406). They measure EID using 11 bipolar statements, where respondents consider how they view themselves in relationship to the environment.

Both Stets and Biga's (2003) and Clayton and Opatow's (2003) EID scales were reviewed by a sample of Florida cattle ranchers to determine their applicability with this target audience. Following analysis of both scales, a final, altered EID scale was created by the authors to predict cattle rancher engagement in a CE agreement.

Methods

The research target audience was Florida cattle ranchers. Ranches consist of over half (5,738,598 acres) the total farmland in Florida (Veneman, Jen, & Bosecker, 2004) and are the top target for CE programs delivered throughout the state (Conservation Trust for Florida, 2007). The sample was drawn from cattle ranch members of the Florida Farm Bureau ($n = 2,700$), whose list (1) separated cattle ranchers from the broader category of "livestock," which included smaller farms not suited for CE agreements, and (2) was recently updated. Ranchers were defined as individuals who raise and

sell cattle for consumption.

Prior to developing the survey, six in-depth interviews were conducted with ranchers: two who had entered into a CE agreement, two who were in the process of doing so, and two who were approached but not interested. The Florida Farm Bureau, the Conservation Trust for Florida, and the Florida Chapter of the Nature Conservancy recommended the ranchers as a panel of experts. The interviews helped determine appropriate survey question wording and EID scale use. A constructivist theoretical perspective was followed with a semi-structured interview approach. Each interview lasted between 30 and 90 minutes and was conducted on the participant's property. Qualitative responses to the interview questions were transcribed verbatim, and themes were extracted from the data using inductive analysis (Coffey & Atkinson, 1996; Hatch, 2002).

Following the in-depth interviews, the survey instrument was developed and peer-reviewed by a panel of 12 experts for face and content validity (Dillman, 2007). Thereafter, a two-phase pilot test was conducted. In phase one, three ranchers re-reviewed the instrument for face and content validity. In phase two, 17 randomly selected ranchers completed the instrument to check for content validity, reliability, and sensitivity.

Construct validity and internal consistency were measured using principal components factor analysis (Crocker & Algina, 1986). Promax oblique rotation was used to aid in data interpretation when necessary. Internal consistency was checked for each variable using Chronbach's alpha, and factor analysis was used to check for unidimensionality. Item discrimination procedures were used to measure sensitivity of the items. Items with a corrected item-total correlation of less than 0.20 were either revised or deleted depending on whether (a) Chronbach's alpha would increase and (b) the item was dependent on another within Ajzen's (1991) theory of planned behavior (i.e., a corresponding outcome evaluation to a behavioral belief). Following the pilot test, equal sized stratified random sampling was used to select 1,000 participants based on projected county population growth.

To reduce the potential for measurement error, methods for mail questionnaires outlined by Dillman (2007) were followed. This included (1) a personalized prenotice letter; (2) a personalized cover letter, finalized survey instrument booklet, incentive (10% off their entire purchase at Tractor Supply Co), and a postage-paid business reply envelope; (3) a thank you/reminder post card; and (4) a letter to nonrespondents and replacement survey.

Results

Objective 1: Environmental Identity Scale Use with Farmers/Ranchers

The rancher interviews provided insight into perceptions regarding EID scales. Following a discussion about CEs and other variables used, respondents were asked to "think out loud" as they read two EID scales. Stets and Biga's (2003) 11-item bipolar EID scale was the first presented. This scale asks participants to rate how they view themselves in relationship to the natural environment (NE). Response options range from one (reflects agreement with the first bipolar statement) to five (reflects agreement with the second bipolar statement). This scale appears as follows.

Table 1.

Environmental Identity Scale by Stets and Biga (2003, p. 409)

In competition with the NE	...1 2 3 4 5...	In cooperation with the NE
Detached from the NE	...1 2 3 4 5...	Connected to the NE
Very concerned about the NE	...1 2 3 4 5...	Indifferent about the NE
Very protective of the NE	...1 2 3 4 5...	Not at all protective of the NE
Superior to the NE	...1 2 3 4 5...	Inferior to the NE
Very passionate towards the NE	...1 2 3 4 5...	Not at all passionate towards the NE
Not respectful of the NE	...1 2 3 4 5...	Very respectful of the NE
Independent from the NE	...1 2 3 4 5...	Dependent on the NE
An advocate of the NE	...1 2 3 4 5...	Disinterested in the NE
Wanting to preserve the NE	...1 2 3 4 5...	Wanting to utilize the NE
Nostalgic thinking about the NE	...1 2 3 4 5...	Emotionless thinking about the NE

One major point of confusion raised by all six participants concerned the definition of "natural environment." Ranchers were confused about whether the natural environment referred to areas on their ranch that were not used at all for production agriculture, or if this meant all land that was unpaved or not built upon (which would then include all of their rangeland, irrigated citrus groves, etc.). Ranchers stated that they would answer quite differently depending on the definition of "natural environment."

All voiced potential issues with items 2 and 3. Their means of making a living is via a connectedness to the natural environment. They are then in effect concerned about the natural environment given that bad growing seasons and other pressures would jeopardize their profit. Thus, their primary connection and concern is due to the fact that this natural environment is their source of income, which they felt was not what the scale was attempting to measure. The last major point of concern

was item 10. One rancher indicated, "we all want to preserve our land and way of life, but we need to use the environment to survive...this doesn't make sense to me." The interviews demonstrated the great potential for measurement error in using this scale with ranchers.

Following Stets and Biga's (2003) scale, ranchers were asked to read Clayton and Opatow's (2003) 24-item EID scale, where respondents strongly disagree (rated as one) to strongly agree (rated as five) to a set of statements. The scale appears as follows.

Table 2.
Environmental Identity Scale by Clayton and Opatow (2003, pp. 61-62)

I spend a lot of time in natural settings (woods, mountains, desert, lakes, ocean)	1	2	3	4	5
Engaging in environmental behaviors is important to me	1	2	3	4	5
I think of myself as part of nature, not separate from it	1	2	3	4	5
If I had enough time or money, I would certainly devote some of it to working for environmental causes	1	2	3	4	5
When I am upset or stressed, I can feel better by spending some time outdoors "communing with nature"	1	2	3	4	5
Living near wildlife is important to me; I would not want to live in a city all the time	1	2	3	4	5
I have a lot in common with environmentalists as a group	1	2	3	4	5
I believe that some of today's social problems could be cured by returning to a more rural life-style in which people live in harmony with the land	1	2	3	4	5
I feel I have a lot in common with other species	1	2	3	4	5
I like to garden	1	2	3	4	5
Being part of the ecosystem is an important part of who I am	1	2	3	4	5
I feel that I have roots to a particular geographic location that had a significant impact on my development	1	2	3	4	5
Behaving responsibly toward the Earth—living a sustainable lifestyle—is part of my moral code	1	2	3	4	5
Learning about the natural world should be an important part of every child's upbringing	1	2	3	4	5
In general, being part of the natural world is an important part of my self-image	1	2	3	4	5
I would rather live in a small room or house with a nice view than a bigger room or house with a view of other buildings	1	2	3	4	5

I really enjoy camping and hiking outdoors	1	2	3	4	5
Sometimes I feel like parts of nature—certain trees, or storms, or mountains—have a personality of their own	1	2	3	4	5
I would feel that an important part of my life was missing if I was not able to get out and enjoy nature from time to time	1	2	3	4	5
I take pride in the fact that I could survive outdoors on my own for a few days	1	2	3	4	5
I have never seen a work of art that is as beautiful as a work of nature, like a sunset or mountain range	1	2	3	4	5
My own interests usually seem to coincide with the position advocated by environmentalists	1	2	3	4	5
I feel that I receive spiritual sustenance from experiences with nature	1	2	3	4	5
I keep momentos from the outdoors in my room, such as shells or rocks or feathers	1	2	3	4	5

Between the two scales, Clayton and Opatow's (2003) EID scale produced the least amount of confusion, albeit several changes were suggested. First, none of the ranchers interviewed liked the term "environmentalist," and it was suggested that this word be changed to "conservationist." All participants interpreted "environmentalist" to mean a disconnected extremist lacking any agricultural experience, yet who imposed regulations on ranchers without understanding their lifestyle. Five mentioned that if the term environmentalist was used throughout the survey, they would not respond. "Conservationist" on the other hand, was interpreted as someone who wanted to preserve and protect the land for future generations.

Several items were removed from Clayton and Opatow's (2003) scale as ranchers felt (1) the items did not make sense given their lifestyle (making a living off the land), and (2) some items sounded too "left wing." Following the critique and revision of this scale, the ranchers later re-reviewed the revised scale for issues, and minor final changes were made. The finalized scale appeared as follows.

Table 3.

Rancher Environmental Identity Scale, Adapted from Clayton and Opatow (2003)

When I am upset or stressed, I feel better by spending some time outdoors, connecting with nature	1	2	3	4	5
Living near nature is important to me; I would never want to live in a city	1	2	3	4	5
If I had enough time or money, I would certainly devote some of it to working for conservation-based causes	1	2	3	4	5
I think of myself as part of nature, not separate from it	1	2	3	4	5
I have a lot in common with conservationists as a group	1	2	3	4	5

I feel that I have roots with a particular geographic region that had a significant impact on my development	1	2	3	4	5
Behaving responsibly toward the Earth—living sustainably—is very important to me	1	2	3	4	5
Learning about nature should be an important part of every child's upbringing	1	2	3	4	5
If I had to choose, I would rather live in a small house with a natural view than a bigger house with a view of other buildings	1	2	3	4	5
I would feel that a very important part of my life was missing if I were not able to get out and enjoy nature from time to time	1	2	3	4	5
Interacting with nature is very important to me	1	2	3	4	5
My own interests usually seem to coincide with the position advocated by conservationists	1	2	3	4	5

Objective 2: Environmental Identity as a Predictor of Conservation Behavior among Farmers/Ranchers

Of the 1,000 participants sampled, a 60.2% response rate was received, with 517 usable surveys. Item nonresponse was handled prior to data analysis via multiple imputation (Schafer & Graham, 2002). Once missing data was accounted for, nonresponse error was addressed by comparing early and late respondents using selected demographic information and responses to the dependent variable (Ary, Jacobs, Razavieh, & Sorenson, 2006). Respondents were categorized into three successive questionnaire waves: (1) following the original questionnaire distribution (early), (2) following the reminder/thank you postcard delivery (mid), and (3) following the letter to nonrespondents and replacement questionnaire (late). Of the 262 early and late respondents, no significant difference existed on their responses to the dependent variable ($t=-0.527$, $df=260$, $p=0.5999$). Also, there was no significant difference between demographics of early and late respondents and responses to the dependent variable.

The majority of respondents were male ($n = 434$, 83.9%), and the average age was 61 years ($SD = 13.87$). Participants had an average number of two ($SD = 1.42$) children, and almost all had at least a high school degree. The average ranch size was between 100 and 299 acres, and years of family ownership ranged from two to 178 ($M = 46.8$, $SD = 32.63$).

Reliability of the 12 EID items was 0.879. Corrected item-total correlations ranged from 0.424 to 0.701, indicating satisfactory discrimination. Principle component factor analysis was applied to recheck the reliability of each construct and ensure validity of the constructs measured. Two factors were extracted from the EID scale, so Promax rotation was used to aid in interpretation. Factor 1 consisted of eight items and accounted for 46% of the variance in EID. Each of these items concerned connection to nature. Therefore, this factor was termed "nature identity." Factor 2 consisted of four items that accounted for 11.98% of the remaining variability in EID. Each of these items concerned conservation and sustainability, so this factor was termed "conservation identity."

Results of the factor analysis are displayed in Table 1.

Table 4.
Environmental Identity Factor Loadings (N = 517)

Variable	Factor 1: Nature identity	Factor 2: Conservation identity	Communality
Interacting with nature	0.865	0.470	0.749
Enjoying nature	0.828	0.378	0.692
Learning about nature	0.752	0.463	0.571
Small house with natural view	0.741	0.371	0.550
Connecting with nature	0.697	0.433	0.491
Part of nature	0.660	0.522	0.475
Living near nature	0.627	0.217	0.412
Roots in geographic location	0.453	0.421	0.250
In common with conservationists	0.416	0.906	0.828
Interests coincide with conservationists	0.398	0.852	0.731
Devote time and money to conservation	0.465	0.824	0.680
Living sustainably	0.630	0.644	0.529
Eigenvalues	5.520	1.438	
Percent of variance explained	46.003	11.980	
Cumulative percent of variance explained	46.003	57.983	
Correlation between factors	0.535		

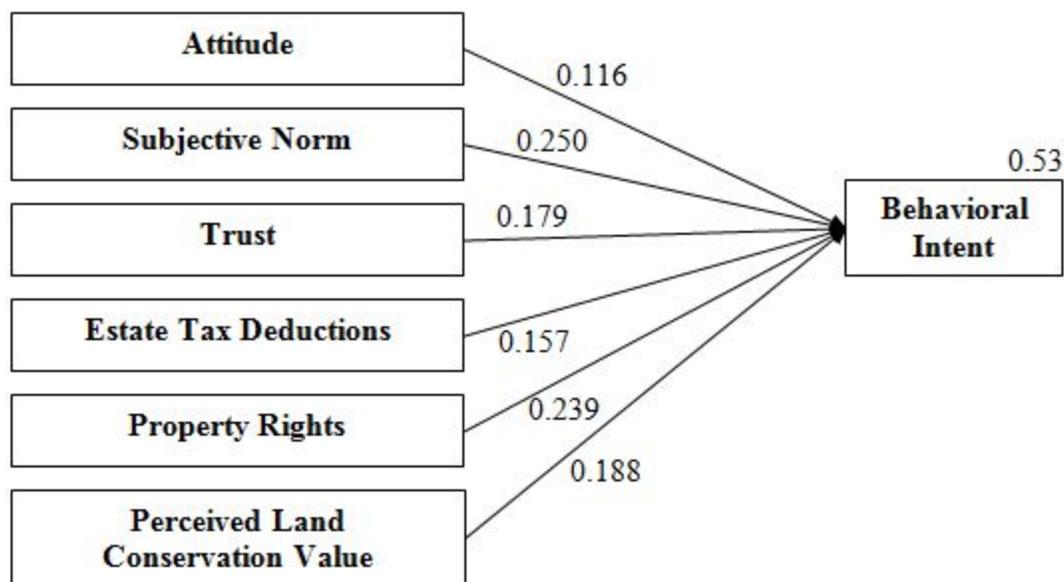
Prior to building a regression model to predict engagement in a CE agreement, a correlation matrix was created to examine the relationship between all variables and the dependent variable. Factor scores were used for all constructs in the correlation matrix. Given the large sample size in this

analysis, almost all variables were listed as "statistically significant" ($p < .05$). Therefore, r^2 values were tabulated for all variables in the matrix. Any variable that explained less than 10% of the variance in the dependent variable was removed. Also, the largest contribution was less than one percent given other variables in the final model. The remaining variables included: (1) trust ($r = .496$), conservation identity ($r = .439$), attitudes ($r = .538$), subjective norms ($r = .542$), perceived land conservation value ($r = .355$), receiving a payment for the CE ($r = .412$), estate tax deductions ($r = .398$), property tax deductions ($r = .349$), ability to keep land in its current use ($r = .451$), perpetual (forever) nature of CEs ($r = .383$), providing a sanctuary for wildlife ($r = .374$), protection from future development ($r = .430$), and sale/donation of certain property rights ($r = .473$).

Stepwise, forward and backward regression analyses were then conducted to select the best fit. All three techniques yielded six final independent variables. These included attitude, subjective norms, trust, estate tax deductions, sale or donation of certain property rights, and perceived land conservation value. The six variables collectively explained 52.9% of the variance in likelihood of engaging in a CE agreement (Adjusted R-square = 52.3%). Using the standardized beta coefficients, Figure 1 displays a regression model illustrating the explanatory power of each variable on the dependent variable. As can be seen, neither conservation identity nor nature identity were significant predictors of rancher behavioral intent to enter into a CE agreement.

Figure 1.

Regression Model Illustrating Direct Effects of Significant Variables on Behavioral Intent



Discussion

Factor analysis extracted nature identity and conservation identity from the EID scale used. Although both nature identity ($r = 0.312$) and conservation identity ($r = 0.439$) were moderately correlated with intention to engage in a CE agreement (dependent variable), neither was a significant predictor of conservation behavior among ranchers given the other variables in the model (attitude, subjective norms, trust, estate tax deductions, property rights, and the rancher's perceived conservation value of their land). This finding is inconsistent with Clayton and Opatow's (2003) research, where EID was

highly correlated with environmental behaviors ($r = 0.64$). The lack of an increase in r^2 indicates that nature identity and conservation identity overlapped with the predictors that were already in the model, therefore not explaining any additional variance. Given this finding, more research is needed on the development of EID scales as significant independent predictors of farm/ranch conservation behavior. Because two factors were extracted from the 12-item EID scale, research also is needed to develop a comprehensive and single factor EID scale to use among farmers/ranchers.

Furthermore, given that conservation identity (four items) was more strongly correlated with behavioral intent than nature identity (eight items), use of an abbreviated conservation identity scale may be more applicable to farm/ranch audiences when predicting conservation behavior. Research is still needed on the development of an EID or conservation identity scale that is consistently a strong predictor of conservation behavior among farmers/ranchers. Also, given that 1. Sustainability is becoming a top programmatic focus for many educators, and 2. There are strong emotions connected with various sustainability-related terms such as "environmentalist," "steward," and "conservationist," there is a need for further research testing terminology interpretation and preference among various key Extension audiences.

Interview results demonstrated the importance of pilot testing any EID scale or environmental research to predict conservation behavior among farmers/ranchers. Any misinterpreted wording can result in disgruntled respondents unwilling to reply. Especially with an agricultural audience, words too strongly associated with environmentalists can create a complete communicate block. This disconnect helps explain why trust ended up as one of the major predictive variables of intent to engage in a CE agreement. Extension professionals delivering sustainability or conservation-related workshops to farmers and ranchers would benefit greatly if care were given to establish a sense of trust with this audience, and a great way to do so is to use accepted terminology, such as the term "conservationist" as opposed to "environmentalist."

The importance in pilot testing EID scales and environmental terminology in general among farmers and ranchers can be summarized via the many written survey comments by this audience, a sample of which is provided below.

- "I am a conservationist but not a 'wild eyed' environmentalist. I believe nature's resources are for use but not abuse."
- "The EPA, environmentalists, animal rights, tree huggers, and greenies will be the downfall of the USA."
- "I would never 'worship' land or nature, it is for providing food for people (the most important created being on Earth) it is my way of making a living. It is my gift and talent, what I was created to do to maintain a living."

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