Environmental Desirability Responding: One Possibility in Addressing the Attitude-Behavior Gap

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Introduction

The authors of this paper believe that there are two salient purposes for many outdoor education programs: (a) the enhancement of individual self-systems such as self-concept and self-awareness, and (b) the development of knowledge and understanding of the natural environment that ultimately leads to actions and behaviors that are protective of those environments. It is this second purpose which provides the focus of this study, namely developing a better understanding of the relationship between stated beliefs regarding the natural environment and specific actions related to those environments. In addition, this study was concerned with the development of an instrument to measure the level of a new construct associated with the attitude/behavior relationship—Environmental Desirability Responding (EDR).

One of the underlying assumptions made by many outdoor education programs is that a student's attitude toward the natural environment can be modified toward more pro-environmental beliefs through the acquisition of new knowledge and direct experiences with or in those environments. In turn, these attitudes can lead to behavior changes that possibly lead to more pro-environment actions, such as recycling, reduced consumption patterns, or even advocacy. Thus, using a properly sequenced set of knowledge and experiences in order to develop informed and pro-environment attitudes and behaviors has become one standard way to design both outdoor education activities and curricula.

One of the more vexing problems associated with this assumption, however, has been the consistent lack of congruency between expressed attitudes regarding the environment and subsequent behaviors. Numerous authors have linked this incongruity to a variety of causes including lack of personal involvement in the natural environments, differing early life experiences, normative values and beliefs, social determinants, and various demographic variables such as gender or age (Corral-Verdugo & Frias-Armenta, 2006; Karp, 1996; Nordlund & Garvill, 2002; Poortinga, Steg, & Vlek, 2004; Samdahl & Robertson, 1989; Stern, 2000). Kollmuss and Agyeman (2002), perhaps, best capture the totality of the findings from the body of work done on the environmental behaviors by stating that the issue of understanding pro-environmental behavior is far more complex than the 'deficit' models that suggested that more environmental knowledge will automatically lead to a change in attitude, and then this change in attitude will lead to more pro-environmental behaviors.

In this study, we posit another possible explanation of the environmental attitude-behavior gap, namely, environmental desirability responding (EDR). In addition to discussing the concept of EDR, this study also presents an instrument that was developed for measuring the presence of EDR.

63

Environmental desirability responding (EDR) is similar to the more commonly known Social Desirability (Crowne & Marlowe, 1960; Paulhus, 1991), where individuals respond to questionnaires in a manner they deem more "desirable" or acceptable, regardless of their true feelings about the issue (Ewert & Galloway, 2004). In the case of EDR, however, we suggest that individuals may be responding to questions and other research instruments designed to measure environmental attitudes in a way that reflects a perception of correctness, or the "right answer," as opposed to genuine perceptions and beliefs. If EDR is a correctly identified construct, its presence would throw into doubt much of the research previously done on environment attitudes, since there would be questions as to how many of the expressed attitudes are due to actual beliefs and how many are a manifestation of systematic and biased responding. At the very least, EDR would need to be considered before reaching any conclusions regarding expressed attitudes, beliefs, and subsequent behaviors related to the natural environment. We are suggesting that EDR may be useful in furthering our understanding regarding why expressed attitudes and beliefs do not always translate into actual behaviors. We recognize, however, that there are a number of other competing explanations for the attitude-behavior gap such as unawareness of consequences (Stern, 2000) and carelessness (Brown, Peterson, Brodersen, Ford, & Bell, 2005).

Environmental Attitudes and Behaviors

While psychomotor skills and cognitive performance tend to represent maximal or optimal types of responses, measurement of attitudes and other affective variables tend to represent typical characteristics (Hopkins, 1986). In a similar fashion, we are defining environmental attitudes as a view or perspective an individual holds about the natural environment. Similarly, we have broadly defined environmental behaviors as those actions that impact or reflect an individual's beliefs and attitudes toward the environment. For example, an individual may espouse a belief that the environment is sensitive to human-caused inputs such as CO_2 emissions (i.e., attitude) while they are fueling their SUV's (behaviors). Explaining why this dichotomy between expressed or stated attitudes and beliefs about the environment and an individual's specific actions or behaviors is so prevalent lies at the heart of this work.

Not surprisingly, a number of theories have emerged that have attempted to explain the formation of environmental attitudes. Jurin and Fortner (2002) suggest that interrelated values and beliefs are integral components of the development of attitudes. Likewise, Hernandez, Suarez, Martinez-Torvisco, and Hess (2000) point to social paradigms or mass beliefs (Jurin & Fortner, 2002) as instrumental in forming environmental attitudes. Nordlund and Garvill (2002) categorize values as general (e.g., self-transcendence vs. self-enhancement) and environmental (e.g., ecocentric vs. egocentric).

Within the perspective of normative beliefs and values, Schwartz (1977) posited that personal norms, or beliefs of what is acceptable behavior, are a critical driving force in an individual's determination of what are acceptable behaviors toward the environment and what are not. Stern, Dietz, Abel, Guagnano, and Kalof (1999) elaborated on this theory by developing the value-belief-norm theory of environmentalism. Within this context, Stern and his colleagues believe that it is the combination of values, beliefs, and norms that form attitudes toward the environment. Likewise, Corral-Verdugo and Frias-Armenta (2006) point to the important role

64

that personally held normative beliefs play in the formation of both environmental attitudes and actual behaviors toward the environment.

As evidenced through many environmental and outdoor education programs in existence, a number of authors suggest that the acquisition of facts and knowledge can be useful in the formation of values and subsequent attitudes (McMillan, Wright, & Beazley, 2004; Rideout, 2005). Other theories suggest that environmental attitudes can be formed and influenced by factors such as outdoor activities (Palmberg & Kuru, 2000) and early-life outdoor experiences (Ewert, Place, & Sibthorp, 2005).

From a different perspective, Franzen (2003) posits that environmental attitudes are related to individual and collective wealth. That is, the wealthier the individual or nation the higher the expressed concern for environmental issues such as climate change or resource exploitation.

Finally, Hines, Hungerford, and Tomera (1986) found that knowledge of issues, knowledge of action strategies, locus of control, an individual's sense of responsibility, and their environmental attitudes were associated with proenvironmental behaviors. Similarly, Rokicka (2002) suggests that ecological knowledge and education play important roles in influencing an individual's behaviors toward the environment. More recently, Thapa, Graefe, and Meyer (2005) reported that level of specialization and environmental knowledge were strongly associated with predicting proenvironmental behaviors.

None of the theories mentioned above, however, have been fully successful in explaining the "gap" between attitudes and behaviors. Jurin and Fortner (2002) suggest that individuals hold *symbolic* environmental beliefs and attitudes that tend to breakdown when faced with choices in actual present and future behaviors.

Olli, Grendstad, and Wollebaek (2001) suggest three reasons for the lack of congruity between specific attitudes and/or variables and actual behaviors. First, statistical analytic techniques may be underestimating the actual relationships between the variables under study. Second, measurement may be imprecise or at differing levels. That is, a scale item measuring a specific attitude (e.g., the earth's resources are finite) may be compared to a general behavior (e.g. using public transportation). Third, the social context (e.g., social network of which the individual is part) may be neglected.

It is this third reason, which serves as the basis of this conceptual paper and subsequent instrument development. While Olli et al. (2001) thought of social context within the confines of participation in environmental organization, we argue that social context also refers to the social milieu and social learning that has lead the individual to this point in time. More specifically, we believe that prior learning, whether within a social network (e.g., friends or family), exposure to the media, or more formal education and/or training, tends to create, within the individual, a set of attitudinal responses and statements that may not represent actual beliefs or behaviors but represent a more socially-desirable set of responses (SDR). Further, it is this set of socially-desirable responses that are not strongly linked to an individual's behaviors or actions and, hence, help create the "gap" between what people say they believe or feel about the environment and what they actually do.

Socially Desirable Response Bias

Ewert and Baker (2001) suggest that the gap often found between environmental attitudes and environmental behaviors might be attributable, at least in part, to a bias to respond in socially desirable ways to test items designed to assess environmental attitudes (such a bias being referred to as "environmentally desirable responding"). Holtgraves (2004) defines social desirability as a tendency to respond to self-report items in a manner that makes the respondent look good rather than responding in an accurate and truthful manner. Within the context of using self-reported data relative to the natural environment, people could be responding to such items in ways that are consistent with well-known and socially acceptable views about environmental issues and positions and not on the basis of how they really feel. In such cases, a stated environment-related attitude might not be associated with the behaviors expected of people who truly hold that attitude. In the following section, the topic of socially desirable responding is examined in detail with a view to indicating how best it can be dealt with in studies of associations between environmental attitudes and behaviors.

Types and effects of SDR

Of all the response biases identified in the literature, Socially Desirable Responding (SDR) has received by far the most research attention and several questionnaires have been developed for its measurement (see King & Bruner, 2000; Paulhus, 1991 for discussions of SDR instruments). As previously indicated, SDR is characterized by the answering of attitude assessment items in ways which make the respondent appear most favorable in relation to prevailing social norms. In situations where SDR is not of theoretical interest - that is, it is not conceptually related to other variables under examination (see Paulhus, 1991, p. 23) - it may threaten the validity of research by obscuring the nature of the relationships of interest by leading to spurious correlations or suppression, or moderation of relationships between variables (Ganster Hennessey, & Luthans, 1983).

Two factors have consistently been identified in factor analytic examinations of results obtained using SDR instruments – impression management and self-deceptive positivity (others vs. self-deception respectively). Impression management involves the deliberate tailoring of answers to questionnaire items to convey an image of the responder to an audience as being socially conventional and dependable. On the other hand, self-deceptive positivity is an honest but overly positive self-presentation, the conscious tendency to see oneself in a favorable light (King & Bruner, 2000; Paulus, 1991). The next section examines several issues to do with the control of such responding.

Causes and Control of SDR

A variety of circumstances which might foster the occurrence of SDR have been well documented in the response bias literature. These include: age of participants – younger people are more likely to show SDR; characteristics of the interviewer/experimenter – the more socially similar they are to the participants, the greater is the likelihood of SDR; asking about personally or socially sensitive topics; compromise of participant anonymity; demand characteristics, for example, how questions are phrased can cue participants about the experimenter's expectations, or participants might anticipate that their responses will attract normatively influenced or evaluative consequences (King & Bruner, 2000). Stress-related variables such as instructing participants to respond quickly, distracting them during task performance, and participant

66

emotional arousal, are also known to increase the likelihood of SDR (Paulhus, 1991). In addition, SDR can be associated with the following factors:

- *Priming:* Where socially desirable responding to earlier items in a questionnaire increases the likelihood of such responding to later items (Todorov, 2000);
- *Participant Cultures and Nationalities:* Where specific cultures and ethnicities may create a bias in responding to questions. (See Keillor, Hennessey, & Luthans, 2001; Middleton & Jones, 2000);
- *Ambiguous test items* or topics that the participant has no opinion about.

Two classes of approach to controlling SDR have been identified:
1) Attempt to stop known causes of SDR from bringing about such responding.
2) Remove the effects of SDR, if they do occur, from the relationship between behaviors of interest and affected attitudes.

An important requirement in regard to each of these approaches is an instrument to measure SDR – in the first case, to check, where feasible, whether attempts to stop its occurrence were successful, and, in the second case, to provide a measure of SDR which can be used for statistical removal of its influence, if such is detected. Each of these approaches will now be considered in more detail.

Attempts to Stop SDR from Occurring
Procedures to stop SDR from occurring include removing circumstances known to be associated with the bias, or study participants manifesting SDR in such circumstances. For instance, maximizing participant anonymity is associated with lower SDR. In cases where this is not appropriate, investigators can still attempt to reduce the likelihood of SDR with non-anonymous participants by, for example, telling them that the test contains methods for detecting faking, or by use of the "bogus pipeline" technique. The latter involves participants being hooked up to electronic equipment which, so they are told, can determine whether they are telling the truth (see Paulhus, 1991, pp. 18-19 for a discussion of related techniques). Such techniques can also be useful in reducing SDR associated with some cultures and nationalities, younger participants, and responses to sensitive or threatening questions.

Reduction of the likelihood of SDR in the aforementioned ways should also reduce the possibility of priming of an SDR response mode, as can varying the order of survey items across participants. Using interviewers who are socially distant from participants, telling participants that there are neither expectations nor evaluative consequences of their responses, or minimizing stress associated with the study, might reduce SDR associated with those variables. Reduction of SDR could also be brought about by providing appropriately detailed and clear statements of test items and by provision of a "no opinion" response option to avoid SDR default responding. In addition, during test construction, individual items can be examined to see if they are correlated with an SDR measure and, if so, modified or eliminated.

A newer approach to controlling SDR in attitude assessment is the Implicit Association Test, which does not index people's explicit attitudes by use of self-report measures, but rather their

implicit attitudes through use of a reaction time task to assess the strength of association between pairs of concepts (see King & Bruner, 2000).

Removing the Effects of SDR
If a significant correlation is observed between scores on an SDR measurement instrument and measures of attitudes, statistical control of the SDR is possible. For instance, the effect of SDR can be controlled by being partialled out of the relationship between the variables of interest using multiple regression or partial correlations. On the other hand, if appropriate, SDR can be dealt with by removing data for participants whose scores on that variable exceed a predetermined value (Zerbe & Paulhus, 1987).

Among other things, then, instruments to measure SDR are crucially important in regard to a variety of issues to do with the control of that bias. We now turn to a description of an instrument we are developing to measure the particular form of SDR of interest in this research program – environmentally desirable responding.

The Environmentally Desirable Response Scale (EDRS)

As indicated above, Paulhus (1991) characterizes two types of SDR – impression management, and self-deceptive positivity. The EDR we are developing contains items chosen to index both those types of responding. The items were worded around environmental themes rather than less specific ones in an attempt to increase the likelihood of consistency of responding across the EDR and environment-related topics.

Several of the EDR items that have to do with impression management are modified versions of items chosen from the Paulhus (1988) Balanced Inventory of Desirable Responding (BIDR), and the Crowne and Marlowe (1960) Marlowe-Crowne Social Desirability Scale (MCSD) – see Paulhus (1991). Likewise, a number of the self-deceptive positivity items are modified versions of statements selected from the BIDR. The items chosen from the BIDR and the MCSD were selected, in part, because they could be most easily modified to apply to an environmental context. In addition, the authors suggested another category of items which they believe might be associated with impression management or self-deceptive positivity responses - Informed Concern. In this case, Informed Concern refers to stated concerns, socio-cultural perspectives, and reactions to other people's views regarding the environment. The remainder of this paper describes this instrument, the validation procedures utilized, the results of the instrument validation and implications from this work.

Method

Initial Item Screening
The initial pool of items was vetted to a group of university faculty and students for content and face validity. Items that proved difficult to understand or appeared unrelated to the intent of the EDRS were eliminated from further consideration.

As a result of this initial vetting screening process, the current EDRS comprises 24 items (eight for each of the aforementioned categories), which are rated on a four-point Likert scale anchored by 1 = *does not describe me at all* and 4 = *describes me very well*. There is also a "No Opinion"

response option. Ten items on the EDRS are reverse scored. The EDRS items are listed in Table 1 in the order in which they were presented to participants.

TABLE 1
EDRS Items

1. I never say anything to hurt the feelings of someone who disagrees with me about an environmental issue.
2. I never get upset when people express opinions about the environment which differ from my own.
3. I am not completely honest with other people about my attitudes towards the environment.*
4. I never say bad things about people who disagree with my views about the environment.
5. I am not interested in trying to influence people's thinking about the environment.*
6. I know what actions I should take regarding how best to protect the environment.
7. I do not disagree about environmental issues with new people I meet.
8. I try to understand other people's views about the environment, particularly when they differ from my own.
9. I feel resentful when I don't get my own way in a discussion about environmental issues.*
10. I try to cover up mistakes I make in conversations about environmental issues.*
11. I do not know the reasons why I feel the way I do about the environment.*
12. I don't mind admitting when I know nothing about an environmental issue.
13. I have very definite views about what government policy should be regarding the environment.
14. It bothers me if people dislike me because of my views about the environment.*
15. I do not regret my decisions about environmental issues.
16. My behavior is consistent with my beliefs about environmental issues.
17. My first impressions about environmental issues are usually not correct.*
18. I do not let my emotions influence my views about the environment.
19. I do change my mind about environmental issues.*
20. I am not concerned about environmental issues.*
21. I do not believe that others should share my judgments about environmental issues.
22. I form opinions about environmental issues without always thinking about the issues thoroughly.*
23. I appreciate other people's opinions regarding the environment.
24. I am always honest with myself about how I really feel about the environment.

Note. * = item is reverse score

Sample

The sample used to validate the instrument consisted of university students from Japan, Australia, and the United States. With few exceptions, the students were members of courses in recreation, outdoor education, or psychology. The EDRS was administered during the fall of the 2005 academic year.

Analysis

A principal components analysis was conducted to examine the structure of the 24 scale items (see Table 2). Principal components analysis (PCA) was judged to be more appropriate than principal factors analysis (PFA) to investigate that structure given the preliminary nature of this research. Specifically, the 24 items chosen for inclusion in the scale have not previously been examined empirically. It is not yet clear how well each item indexes the aspect of EDR it was chosen to reflect. In addition, the EDR scale represents one of the first attempts to examine response bias with respect to environmental issues. There are no grounds at present to suggest how many components of the EDRS will reflect such bias. As indicated by Tabachnick and Fidell (2001, p. 612), PCA is useful as a precursor to PFA as it can reveal a great deal about the maximum number and nature of factors.

69

EWERT & GALLOWAY

TABLE 2
The Principal Components Analysis of EDRS Items

Varimax Rotated Components

Brief Statement of EDR Items	1 Self-deception	2 Image Management (Assertion of positives)	3 Image Management (Denial of Negatives)	Communalities
16. Behavior consistent with environmental beliefs	**.696**	.038	-.131	.504
6. Know how to protect the environment	**.672**	-.045	.055	.456
24. I am always honest with myself re feelings about environment	**.652**	.006	-.084	.432
15. I do not regret my decisions re environment	**.630**	.145	-.119	.432
13. Have definite views about government environment policy	**.586**	-.253	.079	.414
23. Appreciate other people's opinions re environment	**.490**	.315	-.058	.343
11. I do not know the reasons I feel how I do.	**.443**	.234	.323	.376
8. I try to understand views re environment different from mine	**.429**	.321	-.106	.300
20. I am not concerned about environmental issues.	**.425**	.164	.224	.257
4. Don't demean those who disagree with my environmental views	.033	**.702**	-.043	.496
1. Don't try to hurt those who disagree with me re environment	.034	**.668**	.179	.479
2. Not upset by environmental view different from mine	.045	**.633**	-.118	.417
5. Not interested in influencing others' thinking	-.340	**.531**	.160	.423
7. Do not disagree with others regarding environment	-.253	**.450**	.321	.370
10. Try to cover mistakes I make re environmental discussions	-.152	-.050	**.760**	.604
9. Feel resentful when don't get own way re environmental issue	.042	-.316	**.714**	.611
14. Bothers me if people dislike me re environmental views	.025	.105	**.650**	.434
22. Form opinions re environment without thinking thoroughly	-.299	.230	**.474**	.367
Eigenvalues	3.21	2.47	2.19	
Variance explained (%)	17.9	13.7	12.2	
Sum of variance explained = 43.8%				
Cronbach alphas	.74	.66	.61	

Note. The value of each alpha does not increase with deletion of any individual item for a given component.

Results

A total of 1024 usable data sets were returned (Japan N=450; the USA N=264; and Australia N=310). Of these respondents, 442 males and 456 females provided usable data (mean age = 21.86, S.D. = 7.1). In addition, 126 respondents did not indicate gender.

As already indicated, principal components analysis was used in order to investigate the construct validity of the EDRS. Examination of the correlation matrix indicated numerous correlations in excess of .30, the KMO measure of sampling adequacy exceeded the suggest criterion of .6 with an actual value of .822. In addition, Bartlett's Test was significant. These initial values suggest that the data satisfy the requirements for performing a good factor analysis (Tabachnick & Fidell, 2001).

Examination of the scree plot indicated that a three factor solution was the most appropriate (see Tabachnick & Fidell, 2001, pp. 620-621). However, six of the items loaded on more than one component. Those items (numbers 3, 12, 17, 18, 19, 21) were removed from the data set, and another PCA run. The KMO from this second PCA was .809, and Bartlett's Test was significant. As none of the correlations between the various components was above .3, a varimax rotation was deemed to be appropriate (Tabachnick & Fidell, 2001, p. 622). The correlations between the components are reported in Table 3.

70

8

TABLE 3
Correlations between the Components

	Components		
	1	2	3
	Self-deception	Image management (Assertion of positives)	Image Management (Denial of Negatives)
1	1.0	.060	.243
2		1.0	.060
3			1.0

As shown in Table 2, all of the items identified with a given component had loadings above .4, and range from "fair" to "excellent" as indices of the component (Tabachnick & Fidell, 2001, p. 625). The first component (associated with 9 items) was labeled "Self-Deception", and accounted for 17.9% of the variance. The second component was labeled "Image Management - Assertion of Positives" (loaded on by 5 items), and accounted for 13.7% of the variance. The third component, which we refer to as "Image Management - Denial of Negatives" (characterized by 4 items), accounted for 12.2% of the variance.

Table 2 contains the Cronbach's alpha estimates of reliability for the items loading significantly on each component. It is generally suggested that alpha values of .70 or more are acceptable (Nunnally, 1978). The alpha observed for component 1 is above that value, the value for component 2 approaches .7, but the alpha for component 3 is somewhat lower at .61. Despite this finding, we believe that the present, albeit exploratory, results can provide useful indications about the nature of other items that could be profitably used in revising a future version of the EDRS. Inclusion of more items, especially with respect to components 2 and 3, would provide a clearer indication of their reliability.

Discussion and Future Directions

The importance of this work lies in the development of an instrument for identifying the construct of EDR. As in previous work done on SDR (Holtgraves, 2004), this study demonstrated the existence of image management and self-deception as extant components in ascertaining the presence of EDR in environmentally-related self-report items. Thus, knowing the extent of EDR, will allow researchers in outdoor education and environmental education to better ascertain the validity of any findings related to self-reported attitudinal scales and instruments. However, as pointed out by McCrae and Costa (1983), questions still remain as to whether these various instruments actually measure response bias or simply reflect a true variation in personality traits.

To the extent that response bias can be measured by any instrument, we believe that the components of the EDRS are actually measuring response bias for three reasons:

1. Many of the EDRS items were modified from existing Socially-Desirable Responses (SDR) instruments.
2. Identified Factors are similar to those generated from past SDR research.
3. The items load on a given component because they have something in common. We believe this something in common is response bias emerging from the presence of EDR.

Since much of the EDRS is developed from past SDR research efforts a reasonable question to ask is why not simply use pre-existing general SDR measurement instruments? We selected the development of a new instrument for two overriding reasons:

1. In order to avoid the singularity of having a highly visible bias-measuring scale, we developed the EDRS to be embedded with other environmental-related questions. In the interest of measurement integrity, we believe it is important for your response bias scale to "not stand out."
2. Specific environmental-related response bias items might provide a more accurate index of actual response bias with respect to environmental-related items than do more general response bias questions. While we argue that this is the case, it is not a foregone conclusion and requires further investigation.

This study has provided some additional insight into the "image" that people may have regarding their use and appreciation of the natural environment. These findings suggest that EDR may moderate or mediate relationships between variables such as personality, environmental beliefs, and behavior. That is, does the presence of EDR account for all or part of the relationship between environmental attitude and behavior (mediator)? On the other hand, as the level of EDR changes, are there corresponding changes in the relationship between environmental attitudes and behaviors (moderator effect) (Tarrant & Green, 1999).

Future work in this area should include a continued refinement of the EDR scale as well as expanding its use to include non-college populations. Finally, further investigations are needed to determine if EDR actually provides a partial or clearer explanation regarding the environmental attitude and behavior gap. For while it seems intuitive that some response bias is occurring when individuals engage in environmental questionnaires or interviews, it remains undetermined whether this effect is significant enough to explain why they do not do what that say they believe.

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72

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73

EWERT & GALLOWAY

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74