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Tactical to Practical: The Human Component of Human-Wildlife Conflict Resolution

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ABSTRACT: Often the greatest challenge in wildlife management is not the management of the animals themselves, but rather the human component of human-wildlife conflict. Persuasive and emotional dialogue is extensively used by private organizations and groups to promote specific agendas. In contrast, a persuasive educational format is often used by science-based groups to promote an agenda. We investigated the effects and importance of word choice using surveys involving wildlife and environmental issues. While topics were identical, survey questions were written to be Persuasive Educational or Persuasive Emotional in structure and were administered to students and to faculty-staff of Berry College. Based on results of surveys completed (n=568), responses could generally be manipulated depending on textual format. However, significant direct exposure to wildlife on the Berry College campus may have influenced the degree of manipulation achieved among both groups of respondents. Results of the study demonstrate the importance of word choice in influencing perspectives. Clearly understanding the perspectives and attempting to identify likely experiences of an audience is essential in order to effectively use written and/or oral delivery of information to achieve public support.

KEY WORDS: educational survey, emotional survey, survey techniques, wildlife perceptions

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INTRODUCTION

Often the greatest challenge in wildlife management is not the management of the animals themselves, but rather the human component of human-wildlife conflict. Establishing public support is difficult and creates significant frustration for those attempting to address a perceived problem (Witmer et al. 2009, Treves et al. 2009, Bremner and Park 2007).

From the beginning of the 20th century, efficiency and productivity of agricultural production resulting in an abundance of food supply essentially eliminated the need to rely on wildlife as a source of sustenance. Increased urbanization has also led to decreased interaction with wildlife (Manfredo et al. 2009). Experience with and exposure to wildlife, particularly during childhood, is reported to have significant influence on perceptions and attitudes (Zinn et al. 2008). However, with a decrease in direct experience, perceptions and attitudes about wildlife are likely coming from a variety of indirect and readily available media sources of information. Thus, perception of wildlife becomes based on social, demographic, cultural, and moral values (Witmer et al. 2009, Zinn et al. 2008, Kendall et al. 2006, Tisdell et al. 2005).

The degree of likability or “cute factor” of a particular species by humans tends to be highest for mammals, followed by birds, reptiles, and insects (Batt 2009, Stokes 2006, Tisdell et al. 2005, Czeh et al. 1998, Kellert 1993). Similarly, fear of direct or indirect contact with numerous species also has an impact on humans from both a behavioral and cost/value perspective (Conover 2009, Zinn et al. 2008, Herzog 1993). Both conditions could influence perception and subsequent support, or lack thereof, in addressing a particular human-wildlife conflict.

Efforts have been made to identify characteristics of individuals considered to be supporters of animal

welfare or animal rights. Kendall and coworkers reported increased animal welfare concerns among women, African Americans, those facing financial hardships, and individuals from youth to middle age (Kendall et al. 2006). In addition, it was reported that perception of motivational interests of different groups was more of a factor than simply being “pro” or “anti” for a particular issue (Kendall et al. 2006). Moral values are also a repeated theme among these individuals (Tisdell et al. 2005). Individuals devoted to animal rights and welfare were reported to be smart, articulate, not crazy, and sincere in their interests (Herzog 1993). It was also suggested that most individuals became involved in animal welfare or animal rights after a highly emotional single event. Degree of activism had a positive correlation to a perceived disgust factor related to animals, but not to other factors such as eating meat or being a vegetarian (Herzog and Golden 2009).

Persuasive and emotional dialogue is extensively used by private organizations and groups to promote specific agendas. In contrast, information presented by science-based groups intending to gain public support appears to be more educationally and factual based. The purpose of this study was to determine the influence of a survey to elicit a response to similar questions presented in either a persuasive emotional or persuasive educational format to students, and to faculty-staff at the college level. Due to the unique abundance of wildlife present on the college campus, we also wanted to examine if those experiences also influenced responses to the surveys.

METHODS

Each survey contained identical questions related to demographics of participant, and self-identification with related organizations and environmental philosophy. Surveys contained 8 questions related to wildlife/

Figure 1. Persuasive Emotional and Persuasive Educational questions administered to undergraduate students and faculty/staff at Berry College.

	Persuasive Emotional Survey	Persuasive Education Survey
Survey Introduction	Dr. George Gallagher and Dr. Susan Logsdon-Conradsen are requesting your help in their investigation of public attitudes toward a variety of wildlife issues. Each question addresses an important animal rights or environmental issue. We are interested in your personal opinion, so please answer each question honestly. The survey should take approximately 2 minutes to complete.	Dr. George Gallagher and Dr. Susan Logsdon-Conradsen are requesting your help in their investigation of public attitudes toward a variety of wildlife issues. Each question considers an important issue and relevant research is provided for your information. Oftentimes, scientific research contradicts what you learned in the media or heard from others, so please read each question carefully. We are interested in your personal opinion, so please answer each question honestly. The survey should take approximately 2 minutes to complete.
Deer Whistle	Numerous devices that attach to your car creating a high frequency whistle (i.e., a "Deer Whistle"), will help prevent a deadly collision with a deer and save an innocent animal's life. Is it likely you would purchase a "Deer Whistle"?	Numerous devices that attach to your car creating a high frequency whistle (i.e., a "Deer Whistle"), are falsely advertised as a way to prevent a collision with deer. All of the research indicates the frequency of sound is well beyond the hearing range of deer and therefore could not possibly work. Is it likely you would purchase a "Deer Whistle"?
Starlings	European Starlings, blackbirds that were introduced to the United States from Europe, have flourished in the past 20-years. European Starlings have beautiful iridescent black and purple feathers, and a large kind eye. Should efforts be made to control the population of European Starlings?	European Starlings, blackbirds that were illegally introduced to the United States from Europe, have flourished in the past 20-years. European Starlings are extremely competitive and they are endangering numerous species of native birds to the point of extinction. Should efforts be made to control the population of European Starlings?
Raccoon Control	Raccoons are furry cute animals with a black mask and human-like hands. They even wash their food before eating. Raccoon populations have increased dramatically since the value of their fur has decreased. Do you think raccoon populations should be controlled?	Raccoon populations have increased dramatically since the value of their fur has decreased. As a result of the overpopulation of raccoons, they are responsible for 96% of the loss of sea turtle nest eggs. Sea turtles are an endangered species. Do you think raccoon populations should be controlled?
Mountain Lion	In several states, the hunting of mountain lions has been banned to protect the lives of these magnificent animals. Should this ban be continued?	In several states, the hunting of mountain lions has been banned due to social pressure. In at least one state the deer population has been decimated due to the mountain lion overpopulation, and mountain lions are starving to death or preying upon livestock and pets in suburban areas. Should this ban be continued?
Prescribed Burning	Burning of forestland destroys innocent animal homes, is traumatic for animals, and may kill some species. Should controlled burning of forestland to remove undergrowth be considered a normal management practice?	Periodic burning to remove undergrowth is a very important factor in habitat restoration for species such as deer, turkey and quail. Should controlled burning of forestland to remove undergrowth be considered a normal management practice?
Feral Swine	Oftentimes domestic pigs that are kept on commercial pig farms or private farms escape their cruel surroundings. Many of these pigs are able to successfully adapt to living free in the wild. Should domestic pigs that escape and become wild be considered a protected wildlife species?	Domestic pigs that escape and become wild have a very detrimental impact on native habitat for deer and other animals. They also carry numerous dangerous diseases that can be passed on to humans. Should domestic pigs that escape and become wild be considered a protected wildlife species?
Endangered Species	There are various endangered species that businesses would like to use as products. For instance, food, jewelry and luggage manufacturers would love to exploit sea turtles for human purposes. Should commercial exploitation of endangered species be allowed?	The American alligator was brought back from the verge of extinction by a cooperative program involving the US Fish and Wildlife Service and legalization of commercial farming for meat and hide production. Cooperative programs like this provide more funding and incentives, decrease illegal killing of endangered species and increase the number of animals released back into the wild. Under these types of controlled programs, should commercial exploitation of endangered species be allowed?
Deer Hunting	Hunting is a recreational sport for many individuals. Do you think hunting represents an important management tool in controlling deer populations?	Overabundance of deer in a given area leads to significant disease and starvation of deer and many other wildlife species. Reducing the deer population will alleviate these problems. Do you think hunting represents an important management tool in controlling deer populations?

environmental issues presented in either a Persuasive Emotional format (which included statements designed to elicit an emotional response), or in a Persuasive Educational format (utilizing wording to emphasize research based information to elicit intended responses) (Figure 1). The Likert format allowed the following possible responses: Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree.

E-mail addresses for students and faculty-staff were obtained through the MS Outlook – Global addresses for Berry College. Individuals within each respective group were included in an e-mail distribution list to receive one of the two surveys. All e-mails to potential participants were sent at approximately 5:00 pm, February 2, 2011. E-mails contained an introduction to the survey and the appropriate web link to access the designated survey (Survey Monkey, com LLC, Palo Alto, CA). Individuals under 18 years of age were instructed to delete the e-mail.

Survey responses were downloaded from the survey host web site to a Microsoft Excel file. Analysis of mean responses to survey questions was completed using multivariate ANOVA procedures of IBM SPSS 20.0 (International Business Machines Corp., Armonk, NY). Survey responses were assigned numerical values in order to obtain mean values (1=Yes, 2=No; 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree).

Table 1. Percentage response of participants in wildlife related organizations and philosophy.

	% YES	% NO	n=
Member of Environmental Organization	16	84	543
Member of Animal Rights Organization	9	91	535
Member of Hunting Organization	14	86	549
Identify as an Environmentalist	53	47	539
Supporter of Hunting Rights	50	50	539

Table 2. Mean ($\pm$ SE) values of responses of participants in wildlife related organizations and philosophy*.

	Male (n=175)	Female (n=368)	P-value ($p < .05$)	Faculty/Staff (n=180)	Student (n=360)	P-value ($p < .05$)
Member of Environmental Organization	1.82 $\pm$.29	1.84 $\pm$.02		1.84 $\pm$.03	1.84 $\pm$.02	
Member of Animal Rights Organization	1.94 $\pm$.02	1.90 $\pm$.02		1.92 $\pm$.02	1.91 $\pm$.02	
Member of Hunting Organization	1.74 $\pm$.03	1.92 $\pm$.01	0.0001	1.87 $\pm$.03	1.85 $\pm$.02	
Identify as an Environmentalist	1.40 $\pm$.04	1.49 $\pm$.03		1.41 $\pm$.04	1.49 $\pm$.03	
Supporter of Hunting Rights	1.36 $\pm$.04	1.56 $\pm$.03	0.02	1.47 $\pm$.04	1.51 $\pm$.03	

*Mean values based on conversion of responses to numerical values (1=Yes, 2=No)

Main effects of survey type, sex, group (faculty/staff or student), and subsequent interactions were determined.

RESULTS AND DISCUSSION

Persuasive Emotional surveys accounted for 58% (n=331) while Persuasive Educational surveys comprised 42% (n=237) of the 658 surveys completed. Response rate for students was 19.4% (376/1937) and 33.8% (192/568) among faculty-staff. Approximately two weeks after administration, it was determined that a server failure had occurred and some persuasive educational surveys had not been delivered to students. To minimize confounding of data and our inability to readily identify individuals not initially receiving the e-mail containing the web link to the survey, we chose not to re-administer the survey. While students under 18 years of age were instructed to delete the survey, we had no method to determine compliance. We could account for non-deliverable e-mails to students (n=156). The ratio of male to female students responding to the survey was similar (34% male, 66% female) to the demographics of the College.

Survey participants indicated membership with environmental (16%), animal rights (9%) or hunting (14%) organizations (Tables 1, 2). However, despite limited affiliation with an organized group, approximately half of the participants identified themselves as an environmentalist and a similar number as a supporter of hunting rights. Diversity in perceptions related to animal welfare is suggested to be more morally instituted than due to preconceived beliefs (Herzog 1993). For example, Herzog and Golden (2009) reported that half the animal activists surveyed were also meat eaters, while half of those declared as vegetarians were not animal activists. No differences ($p > .05$) in any questions related to organization membership, identification as being an environmentalist, or to support of hunting rights were observed between students and faculty-staff. As might be expected, more males were members of hunting organizations ($p < .0001$) and considered themselves to be greater supporters of hunters rights ($p < .02$), as compared to females.

Differences ($p < .0001$) in responses to the Persuasive Emotional and Persuasive Educational surveys occurred in 7 of the 8 questions administered (Tables 3, 4). For the

Persuasive Emotional survey, several concepts were utilized to elicit the desired response. Questions included only animals that would be considered more acceptable or “cute” to humans (Batt 2009, Tisdell et al. 2005, Czeh et al. 1998). Terminology used to describe characteristics of a species such as majestic, furry, or having a “kind eye” was intended to enhance those acceptable factors. It has been documented that inducing a human emotional response is among the most

Table 3. Mean ($\pm$ SE) value response to the persuasive emotional and persuasive educational wildlife surveys.*

Question	Persuasive Educational (n=237)	Persuasive Emotional (n=331)	P-Value (p<.05)	Male (n=187)	Female (n=381)	P-value (p<.05)	Faculty/Staff (n=192)	Students (n=376)	P-value (p<.05)
Deer Whistle	1.51 $\pm$.06	3.29 $\pm$.07	0.0001	2.52 $\pm$.10	2.55 $\pm$.07		2.56 $\pm$.10	2.53 $\pm$.07	
Starlings	4.00 $\pm$.06	3.29 $\pm$.06	0.0001	3.66 $\pm$.08	3.54 $\pm$.05		3.70 $\pm$.07	3.50 $\pm$.05	
Raccoon Control	3.97 $\pm$.06	3.50 $\pm$.06	0.0001	3.74 $\pm$.08	3.67 $\pm$.05		3.72 $\pm$.07	3.68 $\pm$.05	
Mountain Lion	2.29 $\pm$.07	3.95 $\pm$.06	0.0001	3.29 $\pm$.10	3.24 $\pm$.07		3.14 $\pm$.09	3.31 $\pm$.07	
Prescribed Burning	4.20 $\pm$.06	3.42 $\pm$.06	0.0001	3.96 $\pm$.08	3.64 $\pm$.06	0.007	3.97 $\pm$.08	3.63 $\pm$.06	0.012
Feral Swine	1.90 $\pm$.06	2.44 $\pm$.06	0.0001	1.94 $\pm$.07	2.35 $\pm$.05	0.0001	1.99 $\pm$.07	2.33 $\pm$.06	0.007
Endangered Species	3.10 $\pm$.07	1.40 $\pm$.05	0.0001	2.19 $\pm$.10	2.07 $\pm$.06	0.01	2.26 $\pm$.10	2.03 $\pm$.06	
Deer Hunting	4.22 $\pm$.06	4.06 $\pm$.05	0.187	4.34 $\pm$.06	4.02 $\pm$.05	0.002	4.18 $\pm$.07	4.10 $\pm$.05	

*Mean values based on conversion of responses to numerical values

(1 = Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Disagree)

Table 4. Percentage response of participants to persuasive educational and persuasive emotional wildlife surveys.

Persuasive Educational (n=237)	Strong Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Deer Whistle	69.6	17.3	8.4	2.1	2.5
Starlings	1.3	4.2	18.1	46.4	30.0
Raccoon Control	2.1	4.6	13.5	54.0	25.7
Mountain Lion	22.4	43.0	19.8	13.1	1.7
Prescribed Burning	0.8	4.6	7.2	48.5	38.8
Feral Swine	35.9	47.3	10.5	3.8	2.5
Endangered Species	6.8	19.8	37.6	28.3	7.6
Deer Hunting	3.0	2.1	10.1	40.1	44.7
Persuasive Emotional (n=331)	Strong Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Deer Whistle	9.4	13.9	28.7	34.7	13.3
Starlings	5.4	15.4	36.3	30.8	12.1
Raccoon Control	4.2	12.1	28.1	41.1	14.5
Mountain Lion	2.7	7.6	19.6	32.6	37.5
Prescribed Burning	6.9	17.5	18.7	40.2	16.6
Feral Swine	22.4	31.1	29.3	14.5	2.7
Endangered Species	74.0	18.1	3.9	2.1	1.8
Deer Hunting	3.0	3.9	14.2	41.7	37.2

important factors influencing perceptions related to animals (Herzog and Golden 2009, Kendall et al. 2006, Tisdell et al. 2005, Herzog 1993). Within the Persuasive Emotional survey, words or phrases intended to evoke an emotional influence including *innocent*, *exploiting*, *magnificent*, *cruel*, or *living free in the wild* were utilized. For example, the Per-

suasive Emotional question related to protection of mountain lions involved a single sentence portraying hunting in a somewhat negative connotation, as well as protecting lives of magnificent animals (Figure 1). Approximately 70% of respondents indicated agreeing or strongly agreeing to continuing a hunting ban on that species.

A number of approaches could have been instituted in the development of a Persuasive Educational survey. It has been reported that perceptions of animal concerns are significantly based on perceived moral values and motivational interests and less on the often presumed "Pro" versus "Anti" sentiment (Herzog and Golden 2009, Kendall et al. 2006, Tisdell et al. 2005, Herzog 1993). Zinn and coworkers outlined pathways of learning and the difficulties and limitations related to presenting wildlife issues (Zinn et al. 2008). We attempted to provide information with minimal numbers or statistics, and to present material to provide choices and options available under conditions that exist. Thus, information was expressed from what might be identified as a moral basis. The mountain lion question written for the Persuasive Educational survey indicated the hunting ban was due to social pressure (Figure 1). Social pressure may be construed as being an unfavorable political action. It further was suggested that as a result of the ban, deer populations were being decimated; the big cats were starving and/or preying on livestock and pets. Under these conditions, 65% of the participants were opposed or strongly opposed to continuing a ban on hunting mountain lions, in contrast with participants in the Persuasive Emotional survey expressing

70% agreement to maintain a ban. It could be argued that the Persuasive Educational survey used emotional connotations and encouraged a fear perception of wildlife related to preying on pets. Conover (2009) described the challenges and losses that occur both economically and emotionally as a result of fear of wildlife.

Among 4 of the 8 questions, differences ($p < .01$) were observed between females and males, regardless of survey. Males tended to be less influenced by the Persuasive Emotional-formatted survey and/or more in favor in general of the outcome suggested in the Persuasive Educational survey for prescribed burning, not protecting feral swine, commercial use of endangered species, and favoring hunting to manage deer populations. Kendall and coworkers reported that women tended to be more concerned with animal welfare issues than men (Kendall et al. 2006). Interactions of survey type by sex were observed for the deer whistle ($p < .001$) and feral swine ($p < .035$) questions. Again males, regardless of being students or faculty-staff, tended to be less influenced by emotional context than females.

No difference ($p = .187$) in response between surveys was noted for the use of hunting to manage deer populations. The question presented in the Persuasive Emotional survey only indicated hunting as a recreational sport. This may have been insufficient stimulus to evoke the intended response. However, it is also possible that due to the unique Berry College environment, participants have extensive exposure to deer and to some of the related human-wildlife conflicts that occur with that species. Approximately 2,000 students are present on a campus of 10,520 ha. Over 1,400 ha immediately surrounding the main campus is maintained as a wildlife refuge. The deer population, estimated at 1 per 4 ha, is clearly habituated to humans, and it is common to observe numerous other species of animals indigenous to the southeastern U.S. All this exposure provides significant direct and indirect experience with wildlife. Experience and exposure to wildlife constitute a significant opportunity for learning, and human habituation to wildlife may be possible (Zinn et al. 2008). The environment at Berry College may create the conditions for true wildlife habituation, particularly to white-tailed deer. Faculty-staff also favored prescribed burning and not protecting feral swine compared to students ($p < .01$). In both cases, this may be a result of their greater exposure to the local prescribed burning practices and regional experiences with feral swine issues.

IMPLICATIONS

This study illustrates the importance and potential impact of communication on perception to wildlife-related concepts. We recommend that care be taken to identify concerns, interests, and likely experiences and perceptions of an audience before delivery of information occurs. In some cases, written communication on any particular topic may need to be modified to fit a particular audience in order to be effective. While this practice may require additional time and effort, if the intent of the message fails, much more is lost.

Oral communication is much more challenging due to immediate and direct interaction. Identifying audience experiences and current perceptions are even more critical. Avoiding delivery of an emotional response or sarcasm is

essential to avoid unproductive confrontation. A simple analogy to consider is that a good bedside manner makes a good doctor. A good bedside manner requires listening, empathy, and explaining situations in the appropriate terms related to the individual's knowledge and perception. It may be your 3,000th time on a call or particular topic, but could also be their first experience. We all must take responsibility for being the best ambassadors of our profession.

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