THESIS

THE EFFECT OF MESSAGE FRAMING ON ENVIRONMENTAL BEHAVIOR

WITHIN AN EXPLORATORY STUDY ABOUT USING SOCIAL MEDIA

AS A METHOD TO COLLECT DATA

Submitted by

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ABSTRACT OF THESIS

THE EFFECT OF MESSAGE FRAMING ON ENVIRONMENTAL BEHAVIOR
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More and more, traditional research methodologies face limitations of increased non-response rates and lack of participation by a diversity of respondents. The influence of normative messages has also been examined but prior studies indicate the need for further investigation regarding the impact visual stimuli has on environmental behavioral. In this study I examine the influence of message framing on environmental behaviors within an exploratory study using social media as a method to collect data. Based on the results from 69 participants comparing two on-line videos, results show that messages with economics frames yielded no differences in likelihood to engage in environmental behaviors compared to messages with a frame based on social norms. This particular method reached a homogenous group of respondents with similar values about nature and the environment. It is also concluded that popular on-line social media sites such as Facebook have limited ability to draw a random sample of survey participants.

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Chapter 1

Introduction

For the past decade a significant shift has occurred in how the American public receives information, including information about the environment. Now more than ever internet-based social media, television programs, and documentaries with ecological themes are popular among the American people. More and more people are arguably aware of environmental issues; as such information is increasingly available and broadcasted on a daily basis. However, the influence of such media on pro-environmental behaviors remains unclear in response to decreased environmental literacy in America, and growing environmental degradation.

Reviews of American environmental knowledge and literacy advocate an alarmingly low percentage of Americans have even a basic understanding of earth systems, and a significant number believe environmental myths to be actual fact (Coyle, 2005). As the human population increases, many anthropogenic environmental impacts, such as deforestation, poor air and water quality, and global climate change are exacerbated. In many cases, simple solutions made collectively by individuals can have significant impacts on mitigating even the largest of environmental concerns.

In attempts to mitigate such problems, a growing field of interest has emerged in the way environmental messages are communicated to the public. In communication, messages may be tailored, or framed, to a specific audience in order to obtain a positive response. The science behind this phenomenon has interested many researchers in the field of environmental communication and social sciences. Researchers have tested the influence of messages on the public, but only few have isolated and tested the influence

of social norm frames, even though the power of social norms has been established among the research community.

Social scientists also survey populations of individuals in order to provide data to policy makers and concerned stakeholders alike in order for them to make informed decisions to help mitigate such environmental issues, but with continuously decreased response rates to traditional surveys over the last decade researchers will provide less accurate data. With so many developing limitations to traditional survey research methodology, researchers must continuously reconsider, adapt, and modify research protocol to obtain the greatest chance of public participation and access. Researchers have continuously been searching for innovative ways to utilize technology to expedite the research process, but few have conformed to an ever changing public involved in several avenues of on-line communication, specifically social media.

In these exploratory studies I investigate the possibilities of a methodology explored only by a few scientists in health-related fields, but find this project one of the first of its kind within the realm of Human Dimensions of Natural Resources. I also test an economic gain frame against a message communicating a social norm of environmental responsibility via short online videos, to analyze their impacts on behavioral intentions. The thesis is submitted as two manuscripts written to explicate this two-part study.

Chapter II

Benefits and Pitfalls of an Exploratory Study about

Using Social Media as a Method to Collect Data

Abstract

More and more, traditional research methodologies face limitations of an increased non-response rate and lack of full participation by a diversity of survey respondents. Social science researchers must address these issues by investigating exploratory methods of obtaining survey participants. This study explores the viability of using social media to collect social science data about online video messages about environmental sustainability. In this study of 69 participants, I found that my method using social media to collect data reached a diverse group of people in terms of demographics, but a homogenous group of respondents with similar values about nature and the environment. I also concluded that popular on-line social media sites such as Facebook have limited ability to draw a random sample of survey participants.

Keywords: Survey Research, Social Media, Facebook, Message Framing

Introduction

Over the past 10 years, researchers have been challenged with continually lower response rates in survey research. The problem has become such an issue that a conference was convened about the topic in 1999 (Groves, Dillman, Eltinge, & Little, 2002). Since the inception of survey research, researchers have had to adapt sampling methodology to obtain an eclectic, representative sample of a population. In recent history, surveys have espoused methods of data collection reflecting technological advances in computing, explicitly with the materialization of the Internet (Tourangeau, 2004). These advancements have furthered the continually changing field of survey research, but few have investigated the potential of utilizing social media as a vehicle to obtain research participants.

Some researchers have explored the effectiveness of different survey research methodologies and the associated issues that emerge with each. Singer (2003), and Singer, Mathiowetz, and Couper (1993) investigated changes in public attitudes in respect to privacy and confidentiality, more specifically perceptions about whether surveys are an incursion of privacy. It is clear among researchers, specific to telephone research, that solicitations such as telemarketers and undesired callers contribute to an ever mounting decline of survey response rates of the past decade. Currently, telephone surveys rarely achieve response rates greater than 60%, and only the most personal surveys (face-to-face) obtain 90% response rates or greater (Tourangeau, 2004). In investigating this phenomenon, I found several compounding variables impacting the likelihood of individuals to participate in such research methodology.

Americans appear to be increasingly concerned about personal security and privacy, which can have adverse effects on social science research that relies on people's willingness to share information and thoughts. Technologies that prevent or inhibit social science such as caller identification, spam filters, and others are both affordable and accessible. This relatively new desire of seclusion and privacy compounds variables encumbering survey researcher's ability to access the public, and may explain why participation refusal is on the rise for household surveys all over the urbanized world (Groves & Couper, 1998; de Leeuw & de Heer, 2002).

Researchers have recognized and published many other causes for lack of survey research participation. These explanations include a decline in civic engagement (Putnam, 1995; Groves, Singer, & Corning, 2000), amplified concern about privacy and confidentiality (Singer, Mathiowetz, & Couper, 1993), and increasing resistance directed at telemarketers (Tourangeau, 2004).

There is also an obvious trend towards electronic forms of communication among American individuals. We see this through an increase in online communication, specifically in more individual access and utilization of the Internet (Miniwatts Marketing Group, 2010) and a seemingly exponential growth of social media participants (Nielson, 2009). The Nielson (2009) study of Internet-based social networking concluded that nearly two-thirds of those accessing the Internet in the world visit a social networking or blogging site, accounting for nearly 10% of all Internet time. They indicate that social media communities have surpassed personal e-mail as the world's fourth most popular online sector after search, portals and PC software applications. This continuously growing trend of increased time on social networking sites is a phenomenon

that has radically changed the way individuals interact online. Survey research has not kept up with this trend.

Compounding with a changing Internet and social media population, there is also increasing diversity in the U.S. (Bean & Stevens, 2003), and traditional survey research is not culturally viable among some populations. Internet, or computer-based surveys are able to be easily translated for seemingly endless demographics, where participants can simply select a language of their preference (Dillman, 2000). Traditional survey research, such as mail-back or even face-to-face, can be expensive and time consuming when translations must be made for individuals within a sample population.

In order to keep up with changing populations and variability in how people prefer to receive information, survey research must continue to be adaptable. Survey research has long been adapting to, and integrating new and innovative technologies into research methodology. From the introduction of the telephone to computers, researchers have found ways to streamline survey research, making it more efficient and reliable in data entry, and have gained access to participants whom normally would not engage in social science research. With an opportunity to utilize the Internet, specifically social media, it is imperative researchers continue this trend of investigation.

With so many developing limitations to traditional survey research methodology, researchers must continuously reconsider, adapt, and modify research protocol to obtain the greatest chance of public participation and access. Computer-assisted sampling has been around, and has continuously been enhanced and improved for over 25 years, in fact traditional methods have been "revolutionized" by computer technology (Tourangeau, 2004). Researchers have continuously been searching for innovative ways to utilize this

technology to expedite the research process, but few have conformed to an ever changing public involved in several avenues of on-line communication, specifically social media.

Research has yet to identify how to capitalize on this social networking trend. There is a potential to access a diverse and widespread range of individuals with probable tradeoffs of randomization, low response rates, and lack of generalizability. Bailey, Foote, and Throckmorton (2000), Rhodes, DiClemente, Yee, and Hergenrather (2001), and Rhodes, DiClemente, Yee, and Hergenrather (2001) have utilized an *open and active methodology* using social media to collect data, where the study is open to the public, and survey participants actively share the study with their social networks; spreading the study across a network of individuals. Within this methodology, anyone may participate and spread the study. Here, I address the many issues involved in utilizing social media to access survey participants, and investigate this exploratory methodology within the milieu of environmental communication research.

The guiding research question for this study was: Is an open and active method using social media to collect data a viable means of data collection in the context of environmental communication?

Literature Review

More and more people in the United States and worldwide participate in Internet-based activities. The reach of the World Wide Web (WWW) is extended every year to parts of the globe that were nearly unthinkable just 10 years ago as potential locations with Internet access. In 2000, the U.S. Government Working Group on Electronic Commerce predicted that by the end of 2001, there would be more than 450 million people in the world with access to the Internet. Today that number is approaching two

billion (Miniwatts Marketing Group, 2010). The potential of Internet-based sampling methodologies is evident, as the Internet has access to literally hundreds of millions of survey research participants across vast geographical and cultural boundaries (Etter, 2001; Houston,Cooper, Thi Vu, Kahn, Toser, & Ford, 2001).

In this electronic age, 28.7% of the world's population, and 77.4% of North Americans use the Internet, including more than 266 million U.S. adults (Miniwatts Marketing Group, 2010). There is also an increase in the amount of Internet users over the last decade, as described in the descriptive data of Katz, Rice, and Aspden (2001), who found 8% (2,500 adults) of their sample using the Internet in 1995, and 65% (1,305 adults) in 2000. Miniwatts Marketing Group (2010) noted that since 2000 there has been a 143.3% growth of North American Internet users and 444.8% growth in world Internet users. Facebook, one of the most popular social networking sites, reports more than 500 million active users (Facebook, 2010). The power of accessing a wide audience using Facebook, specifically, has become recognized and utilized by major organizations such as Amnesty International, whom utilized it to mobilize protests (Stirland, 2007).

There is also a logical progression in Internet use. Nie and Erbing (2002) argued that as people spend more time on the Internet, and diversify their online activities, the more years they will spend in the future involved in online activities. With such a trend established, we can only expect current users only to be more involved, and the expansion of users to grow.

This vast Internet usage provides an opportunity to specifically access participants who engage in social media activities such as Facebook, Myspace, Twitter, or email. Nie and Erbring (2002) described that as people engage in Internet activities, they are more

likely to *turn their back* on traditional media. Kenix (2009) discussed that people active

in the blogging community often analyze issues deeper than traditional media. Accessing

this audience through social media, including blogs, may provide the researcher with a

population not traditionally explored. With more and more people engaging in Internet

activities, social research has an opportunity to change gears in sampling methodology.

The potential of the Internet and its variety of participants is abundant given that

participants of online activities are able to create communities in chat rooms,

newsgroups, search engines, electronic mailing lists, hypertext links from related web

sites, and web rings on an unbounded range of topics and focal points. These platforms

offer recruitment opportunities to engage the attention of potential research respondents

and stimulate their partaking of a web-based survey, individuals often complicated to

contact and engage while utilizing traditional survey research methodologies (Rhodes,

Bowie, & Hergenrather, 2003).

A Direction for Social Research

Communication studies have concluded that audiences now, more than ever, are

trending away from traditional media outlets such as newspapers and magazines (Chung

& Yoo, 2009). Computers and, more specifically, the Internet have become preferred

vehicles of consumer data collection, news broadcasts and interactive stimuli. Chung and

Yoo's (2009) study of 542 respondents to an online survey revealed audiences visit online

newspapers that provide the user with an opportunity of choice and control over

interactivity. This demand for control over data and news intake puts even more strain on

scientists to communicate environmental issues effectively to an increasingly selective

audience with ever increasing options. It also provides an opportunity for a paradigm shift in research methodology.

Data in the social sciences has typically been collected through traditional methods (e.g. mail-back surveys, phone interviews) that often rely on sampling firms to produce a respondent pool. More specifically, studies have been conducted on environmental behavior using this approach (see Clark, Kotchen, & Moore, 2003) but few have either utilized the Internet for obtaining participants. With more and more people engaging in Internet activities, social research has an opportunity to modify how sampling frames are obtained. It may also enhance our ability to survey a population that is otherwise difficult to reach through typical research methodology.

Only a small number of studies have explored the potential of *open and active* recruitment methodologies, where researchers call on the participant to participate and even facilitate the study. Most of this research can be found in behavioral studies, specifically in health-related fields utilizing snowball and hypertext sampling where participants dispense a uniform resource locator (URL) of either a link to the study, or on-line survey (Bailey, Foote, & Throckmorton, 2000; Rhodes, DiClemente, Yee, & Hergenrather, 2001; Rhodes, DiClemente, Yee, & Hergenrather, 2001). One common theme among these studies, as described by Rhodes, Bowie, & Hergenrather (2003), is the necessity for future research on recruitment and sampling methodologies to explain sample composition and participant experience. This review of the literature has not found support or previous attempts from the environmental sociology field in these methodological efforts. It is my intention to breach this gap to explore a potential direction of environmental research survey sampling.

Social capital among social media participants has become a topic of interest among many social science and communication researchers, as demonstrated by Valenzuela, Park, and Kee (2009). Social capital can be defined as the resources and network of individuals available to an individual through their social interactions (Lin, 2001; Putnam, 2004). Those with a high degree of social capital have access to a large network of individuals, and those connected with individuals with a high degree of social capital can have a certain level of trust or influence from that entity to provide them with information of similar interest. These subsequent norms of trust facilitate a group of people to work with others on common issues (Putnam, 2004). I used this logic combined with Rogers' (1995) *Diffusion of Innovation Theory* to justify selecting individuals as community representatives in my study (see methods).

Rogers (1995) proposes in his *Diffusions of Innovations Theory* that particular innovations or behaviors are adapted by key members of a social group and, if the innovation provides a certain level of increased utility for individuals, will spread throughout and adopted by a social group. This process can happen very quickly. If a survey research methodology were to produce such an event, the promise of attaining a large sample of individuals is feasible.

Considerations and Potential Limitations of an Active Participant Methodology

Several studies have explored the benefits, design strategies and setbacks of collecting data over the Internet. Reips (2001) presented five years of data starting in 1995 collected over the Internet, and finds evidence putting forward that experimental data collection over the Internet is a viable means of collecting data and is able to

significantly augment science. Internet sampling may be especially beneficial in that the researcher is able to engage a large heterogeneous sample, and conveniently replicate research methodology. But one of the major risks, found in a study by Birnbaum (2004), is not being able to duplicate results in a laboratory setting. This study found significant differences between participants tested in the lab and participants in the web study, but they attribute this to the possibility of significant dissimilarity in the subjects tested, rather than fault in the research methodology.

The number of web sites is continuously increasing, and users can find an extremely diverse range of websites to visit and satisfy intellectual demand for a whole host of topics. This makes it that the more difficult for researchers, as competition for respondents and online participants increases (Rhodes, Bowie, & Hergenrather 2003). It is important to recognize, with so many options, the many reasons and ways participants access social networking sites if they are to be used or included in the sampling methodology. Research shows that many people have motivations to join social networking sites so that they may keep connected to friends, and construct relations with acquaintances, but not necessarily to meet new people, as one may perceive (Acquisti & Gross, 2006; Ellison, Steinfield, & Lampe, 2007).

People choose different social networking sites for different reasons, as the sites fulfill an assortment of needs and demands of their participants (Hargittai, 2007). Recommendations are thus made not to limit a study to a specific social networking site, unless one is attempting to be so select in research participants. It is for reasons such as these I chose to adopt my sampling methodology.

Methodological Limitations with Internet-based Social Science

One limiting factor, as described by Dillman (2000), is that while Internet surveys may be able to obtain a large sample size, it is not representative of a whole population. In addition, the methodology has the probability to unintentionally exclude certain social or economic classes. An event such as the *Literary Digest* survey of 1936, is an example of the fallout of such occurrences. In the 1936 survey telephone listings were used to acquire a sample of over a million people, and it falsely predicted that year's presidential election because the survey failed to account for non-telephone users. A similar issue exists today between internet and non-internet users.

Bowker's (1999) analysis of virtually 1000 Web surveys found that social networking sites encompass a range of participants, and the characteristics of the population has a potential to be both widespread demographically and geographically due to the diverse range of contacts associated with online social media outlets. Many people are on the Internet searching for activities to participate in, and are able to stop or start an activity, specifically a survey, whenever they desire. These findings pose several methodological concerns researchers must take into consideration.

Based on the review of literature, the hypotheses in this study were as follows:

H_1: A method using social media to collect data will capture research participants from a range of geographic locations.

H_2: A method using social media to collect data will reach participants from a range of demographic backgrounds.

H₃:Facebook will reach more respondents than other on-line social networking
sites.

<div align="center">Methods</div>

Overview

In order to test an active participant methodology, I created a research
environment involving participant response to videos about environmental sustainability.
Two videos were created, one framing environmental sustainability as an economic
opportunity, and the other as a social norm (Figure 1). A web page was designed to host
the videos and to direct participants to the survey questions about the video they viewed.
Site visitors were prompted with simple instructions upon entering the site. First, they
were instructed to watch a randomly selected video. Following the video, they were
provided a link to the survey. The survey consisted of questions to analyze the values,
subjective norms, behavioral intentions, and demographic information of participants.
After participants completed the survey, a thank-you message asked the participants to
share the study with their social networks.

<div align="center">Figure 1 about here.</div>

Sample

Four people of various backgrounds were selected based on their extensive social
media networks (at least 190 people), demographics and geographic location (Figure 2).
The four people lived in Washington D.C., Maryland, Virginia, Florida, and Colorado,
ranged in age from 21 to 47, and varied in occupations from a college student to Legal
Assistant to nature blogger/writer. Annual incomes ranged between $10,000 and

$100,000. These individuals reported being highly biocentric in their value orientations toward the environment, meaning they generally considered environmental conservation to be a highly important issue. The racial composition included people of Caucasian and Black/African American decent. These individuals were asked to send a message to their social media networks encouraging public participation. Networks included Facebook, Linked-in, and Twitter. Each participant was asked to further send the study to their respective contact lists and networks.

A second on-line approach was used which included placing an ad on the Facebook social media site. In this approach, the ad was displayed on randomly selected individual user's Facebook page after they logged in, encouraging them to participate with a chance to win a $150 gift certificate to a popular on-line merchant. The ad was posted for a total of three months on up to 68,745 Facebook pages each day.

Survey

A 41-item on-line survey was administered following the video. The survey assessed respondents environmental values, subjective norms, behavioral intentions in response to the visual stimuli watched, demographic information, and intentions and means to share the study with those in their social network. Most items were measured on a Likert Scale of 1 (strongly agree) to 7 (strongly disagree). The variables of interest for this study – behavioral intent, subjective norms, environmental values – were scales comprised of a set of individual survey items. Behavioral intent included six-items that asked respondents the frequency with which they intend to enhance the health of the

environment, support environmentally friendly companies, purchase environmentally sustainable products, and reduce their travel emissions.

Environmental values were measured on a seven-item anthropocentric/biocentric Likert Scale of 1 (strongly agree) to 7 (strongly disagree) measuring the perceived value of nature, the role of humans in nature, and natures influence and role within the economy. Seven-items measured subjective norms of individuals. Questions asked respondents about their social network of family and friends, and their perceptions of those around them, respondents were not asked any identifying information in attempt to conceal participant identity.

Analysis

Data was entered and analyzed using the Statistical Package for the Social Sciences version 18. Descriptive statistics, reliability analyses, independent sample t-tests and regression analyses were conducted.

Results

A total of 69 individuals participated in the study over a seven-month time period. Respondents varied geographically, representing 50 different US zip codes from at least 22 states and from regions that included rural, urban and suburban locations and three countries. I therefore fail to reject the first hypothesis.

The majority of respondents were highly educated. More than 43% held a four year degree and 43.1% had a professional or graduate degree. Income levels were also high with 45.2% of respondents reporting an annual household income between $50,001 and $100,000. The age of respondents ranged between 20 and 89, however most

respondents (56 individuals, 87.5%) reported being Caucasian/White. A sample of demographic information is shown in Figure 3. Based on these results, I partially reject my second hypothesis.

Figure 3 about here.

Reliability analyses were conducted to determine if questions operationalizing variables such as environmental values and subjective norms could be grouped into single-item indicators. Table 1 organizes the results of a reliability analysis of subjective norm questions. A total cronbach's alpha of .813 indicated a strong relationship between survey questions, and they were subsequently grouped into a single variable. All variables were retained in the final scale for subjective norms.

Table 1 about here.

A second reliability analysis was conducted to determine if questions of value orientations could be grouped (Table 2). A cronbach's alpha of .803 indicated a strong relationship and the questions were grouped into a single-item indicator. All variables were retained in the final scale for values.

Table 2 about here.

Of the social media utilized by participants, Facebook was the most common way participants heard about the study (Figure 4). I fail to reject my third hypothesis.

Figure 4 about here.

Results from posting the Facebook advertisement showed that 348,174 impressions, or appearances, were made on Facebook account pages, the ad was clicked and viewed 50 times, and a total of three individuals participated in my study after accessing the link to my study from the advertisement.

Discussion

My results concerning the potential of utilizing social media to facilitate survey research advocate the methodology can reach a diverse group of participants geographically and to some extent, demographically. In this study of only 69 participants there was diversity in geography, age, and income, but lack of diversity in values specific to those desired in environmental social science research. Study participants' value orientations did not differ among study individuals; the open sampling methodology generally reached a population with shared values in terms of the environment. The finding consistent with the prior research of Bull, McFarlane, and Rietmeijer (2001), Elford, Bolding, Davis, Sherr, and Hart (2004), and Ross, Tikkanen, and Mansson (2000) in that open recruitment in the US tends to obtain white, well educated, and of greater geographic range in comparison to offline sampling.

Results pertaining to my second hypothesis may be explained by several compounding factors. Survey participants generally participate in studies salient to them; in this case I only reached individuals with a biocentric orientation perhaps because that is the type of individual most likely to view a video about conservation. I therefore may have accessed members of social networks only on one end of an environmental value spectrum, willing to take time out of their lives to support or learn about an issue or importance to them. Given that my initial group of individuals showed a biocentric orientation, it is not surprising that the survey generally trickled down only to people with similar thoughts. With this logic, I uncovered information on value orientations and demographics on a particular population of individuals associated with this mindset. If this is the case, then I find that the majority of these individuals use Facebook, are

White/Caucasian, make an above-average income, are highly educated, and are in their mid-40's.

My strategy to attract a more random survey respondent was introducing an incentive of a $150 gift certificate to a popular on-line merchant. This approach did not involve the same audience as the first methodology of using personal contacts. Instead, it was posted in a Facebook advertisement. Results showed 348,174 impressions, or appearances, on Facebook account pages, the ad was clicked and viewed 50 times, and a total of only three participated in the study. Such a low response rate recommends a the need for a re-evaluation of research protocol so that university researchers might more effectively access and attract Internet participants.

Facebook advertisements reach a vast audience, who may have the mentality of such ads with incentives being *too good to be true*, or, *I don't have a chance of winning*. A response rate this low may imply a lack of interest or attention on such advertisements. It is apparent that a monetary incentive may not be sufficient enough to attract participants from social media participants. People search the internet, and access their social media accounts for specific reasons, and only divert from their objective to pursue a tangent to only fulfill particular curiosities specific to that individual. Because people have a vastly diverse range of interests and curiosities, that change at any given moment, benefits may be in utilizing multiple ads, with a range of incentives (whether monetary, social, or, intellectual). Further research in advertising social science research is advised to build an understanding of this phenomenon. Once the advertisement is clicked, further incentive and interest must be established to capture and hold a participant throughout the research process.

From the 50 individuals who clicked on the Facebook advertisement, only three completed the study. University Internal Review Boards (IRB) require researchers to provide potential research participants immediate knowledge of the objectives of the researchers, and an in depth description of participant rights. While such information is beneficial to the guiding institution in protecting them from any legal concern that may arise, not enough consideration is made to the needs of a participant. Social media participants demand concise, attractive messages and text that provide them with specific stimuli. Internet users are aware they have full control over their Internet experience, as they may enter and exit WebPages as they so choose. IRB's must re-examine the rules and regulations imposed on researchers so that effective Internet research may occur in a safe environment, without inhibiting an investigators ability in conducting social science research within an on-line context. A standard of informed consent must be established. For purposes of comparison, I looked at other on-line surveys posted by private sector entities. Not one of the ten surveys started with abstract or awkward language around risks to the participant and there being "no known benefits" to the participant.

Limitations of the Employed Social Media Outlets

Some of the most interesting information collected by the researchers are that of the participant experience pertaining to their use of specific social media outlets. Facebook, although used by the majority of my study participants, poses several limitations. In order to send a personal message out to their contact list, participants have to add members of their social network individually, and may only add 25 at a time.

These 25 may be the first in their contact lists, alphabetically, not the 25 the community representative has the most social capital with.

Study participants may also create an event, but this requires more time from the individual. I obtained one result from an individual responding to a Facebook *post.* This is where a Facebook member *posts* a message in their *status*, notifying members their contact list of their activities, but these posts are only noticeable to others for a short period of time, as other members of a social network push these messages off a homepage as they are added, making a previous message less recent.

Linked-In, a professional-oriented social media site, attracts a population generally of professionally established individuals, looking to advance their careers and share information with colleagues. With this particular media, participants are not able to read a message right away in their inbox. A message appears to an individual saying "an item has been posted on the communities' discussion board," and from there the individual accesses the bulletin.

Twitter is a public social networking site, where messages are posted to a digital bulletin board. People, in this environment, only see a message momentarily, for a specific period of time. messages do not take priority over other messages. Community representatives in my study were able to post a message, and potentially expose it to thousands of people, but this is dependent on the amount of people actively following a particular profile. In order to compensate for this limitation, my community representative posted a message about my study several times, over a week's time.

Email was reportedly used only in a minority of cases. Limitations of this media include notions that individuals are consistently sent *junk* mail, and those included in a

contact list may be less willing to respond to a message, compared to a Social

Networking site. Contact lists in Email are generally smaller in size compared to that of a

same individual on a social networking site. Researchers in this study were less interested

in the use of Email, but find the voluntary, non-solicited, use of it by participants

interesting, as it provides evidence to inform a preferred method of communication for

some individuals.

Recommendations

I found in my study, even with a limited sample size, that social media

participants are connected to a geographically eclectic variety of individuals. Each person

holds the key to hundreds or thousands of individuals, with the potential of social

influence and pressure to encourage their participation in a mutually important issue.

With such a vast range of individuals, researchers must consider ways to attract the

broadest range of participants in a study, in order to collect information pertinent to those

of interest to the researchers.

In my study, the initial message potential participants viewed was specific in its

environmental origin. Immediately, the audience was exposed to environmentally

oriented messages. This poses limitations in itself, since people are exposed to

environmental messages usually depressing or negative, as indicated in my survey

responses. This in turn may instantaneously turn one off to participation. If an audience

expected to view the status quo of environmental messages, then they may not be likely

to participate in the study. My study analyzed public response to positive, socially or

economically oriented messages, unlike the status quo. More emphasis on the

empowering-positive nature of the messages may have attracted more participants, but caution was taken in order not to influence responses; social desirability bias.

Open ended questions in the survey proved to be useful to the researcher within this exploratory environment. I found, as supported by Rhodes, Bowie, & Hergenrather (2003) and Buchanan (2000), that respondents, overall, participated in the survey more completely compared to other survey methods, and were very likely to endow the researchers with feedback, and *indicated* a desire to help with the circulation of the study.

Studies utilizing such methodologies as this must consider reasons people participate in Internet activities. I find in that the best incentives to participate in a study such as this are not monetary, but activity (entertainment), socially (Social interaction), novel sensory (information seeking), and self-reactive (i.e. to relax or escape) based (Larose, Mastro, & Eastin, 2001). With this, immediate gratification is provided to the participant, and the participant may then further their participation in a study by sharing it with those in their social network. We see examples of this in the spread of on-line videos shared on sites such as YouTube.com, where entertaining videos can be shared with millions of people throughout the world due to non-monetary incentives.

Conclusion

Further exploration, including higher quality videos and an interactive web page campaign, are recommended to truly assess the full potential of this survey research methodology. I have supported the potential to access a geographically vast range of participants in a timely, cost-sensitive methodology. Increasing production quality, and viewer/participation satisfaction will enable the researcher to test the true potential of

integrating social media into acquiring participants in survey sampling. Social media

banner advertisements were also explored in this study with an incredibly low response

rate. This has captured the attention of the researchers into a curiosity to explain this

phenomenon. With this I have also brought attention to a conflict of interests between

IRB and Internet researchers, and put forward a standard of informed consent specific to

an audience of social media participants while protecting the guiding institutions

involved in the study.

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Tables and Figures

Table 1. A reliability analysis of subjective norm questions.

Survey Question	Corrected Item-total Correlation	Cronbach's Alpha if item deleted
Most of my friends behave responsibly toward the environment.	.581	.796
The health of the environment is important to the people around me.	.489	.813
I would consider the people in my close social network to be environmentally conscious individuals.	.763	.693
Individuals in my social network are concerned about the health of the environment.	.713	.717

Overall Alpha = .805

Table 2. A reliability analysis of value orientation questions in respect to an anthropocentric / biocentric scale.

Survey Question	Corrected Item-total Correlation	Cronbach's Alpha if item deleted
The primary value of nature is to generate money.	.609	.762
The needs of humans should take priority over environmental protection.	.701	.699
Nature's primary value is to provide products useful to people.	.610	.763
The value of nature is only in the human mind. Without people, nature has no value.	.583	.761

Overall Alpha = .798

Figure 1. Rubric identifying the structure of the frames used in the videos.

Question	Social Norm Frame (Video A)	Economics Frame (Video B)
What's the problem?	Conserving resources.	Preserving ecosystem services.
Who's at risk?	Everyone	Individuals not taking advantage of green* economic tips.
What's responsible?	Everyone	Individual behaviors and purchasing. Product development and production.
What's the solution?	Join the majority of people and businesses searching to eliminate their own sources of environmental impact. Purchase green products and collectively support a greener planet.	Individual behaviors that will save money and conserve resources. Green technology to reduce resources use.

* "Green" describes environmentally sustainable actions.

Figure 2. Demographic information of *Community Representatives**

Community Representative	Age	Income	Ethnicity	City/State	Education/Degree	Social Media
1	29	$50,001-$100,000	White/Caucasian	Livermore, CA	Professor or Graduate	
2	41	$50,001-$100,000	White/Caucasian	Washington, DC	Professor or Graduate	Facebook, Twitter
3	32	$50,001-$100,000	White/Caucasian	Tacoma, WA	4-year college	
4	28	$10,001-$20,000	Black/African American	Fort Collins, CO	4-year college	Facebook

Community Representatives are the initial individuals asked to pass the study on to their social networks

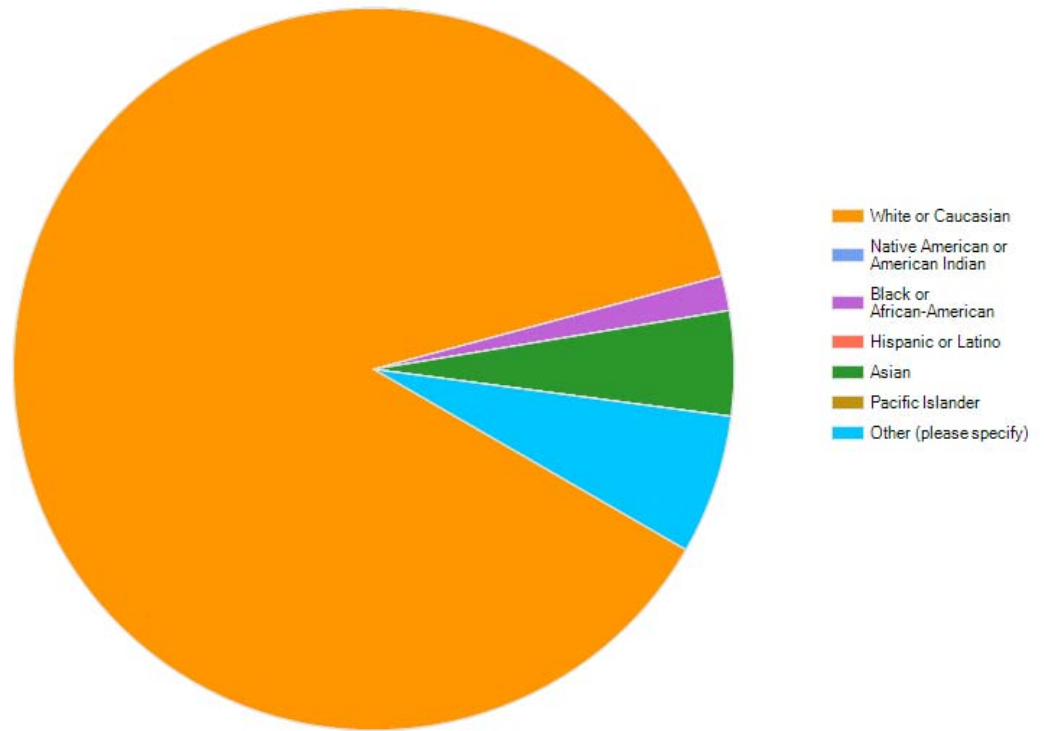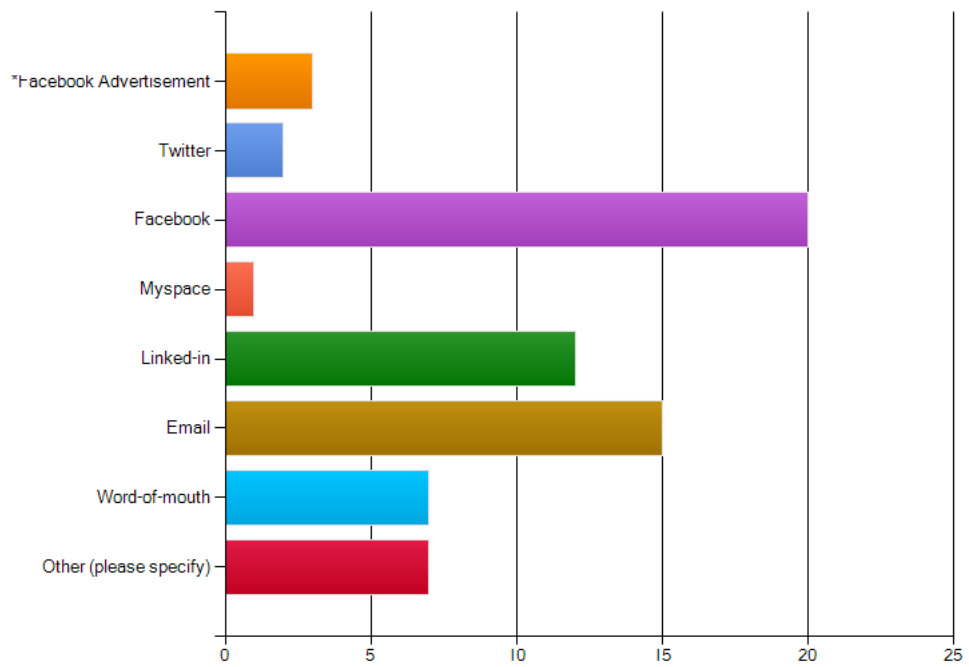Figure 3. Reported ethnical background of participants

Figure 4. Method participants were contacted about the study.

Chapter III

The Effect of Message Framing on Environmental Behavior: An Exploratory Study

Abstract

Many studies have investigated the influence of framed messages, but few have investigated the potential of framing messages using online videos about environmental behaviors. The influence of normative messages has also been examined, but prior studies indicate the need for further investigation regarding the impact visual stimuli has on environmental behavior norms. In this exploratory study I examine the influence of message framing on sustainable behaviors. Based on a study with 69 participants comparing two on-line videos, results show that messages with economics frames yielded no differences about participants' likelihood to engage in environmental behaviors compared to messages with a frame based on social norms. Results also indicate the importance of specificity within messages, further isolating variables within visual experiments.

Keywords: Message framing, environmental behavior, environmental communication

Introduction

For the past decade a significant shift has occurred in how the American public receives information, including information about the environment. Now more than ever internet-based social media, television programs, and documentaries with ecological themes are popular among the American people. More and more people are arguably aware of environmental issues; as such information is increasingly available and broadcasted on a daily basis. However, the influence of such media on pro-environmental behaviors (PEB) remains unclear.

Reviews of American environmental knowledge and literacy suggest an alarmingly low percentage of Americans have even a basic understanding of earth systems, and a significant number believe environmental myths to be actual fact (Coyle, 2005). Generally speaking, it is not necessarily media outlets conveying incorrect information. Individuals assimilate information differently, and in many cases facts can be clouded by preconceived perceptions or rearranged in a person's psyche in order to make relevant sense. This oversimplification can perpetuate a belief in an environmental myth or misconception.

The upshot is evidence exists to propose that individuals understand the basic fact that most environmental threats are anthropogenic, and can be reversed by changes in human behavior (Environics, 2007a). However, despite this recognition about the potential of human behavior change to alleviate our environmental challenges, Americans consume more energy and resources now than ever before, and overall, demonstrate low levels of PEB (Environics, 2007b). Educators and advocates have an opportunity to leverage this situation and connect our awareness with ecological knowledge and the

need for PEBs by engendering public interest, concern, and call to action through appropriate and effective message framing.

As the human population increases, many anthropogenic environmental impacts are exacerbated. In many cases, simple solutions made collectively by individuals can have significant impacts on mitigating even the largest of environmental concerns. Biodiversity protection, mitigation of climate change impacts and energy consumption are environmental issues with tremendous potential for collective human behavior to influence. To make even the slightest impact on these problems, there must be a societal shift in everyday behaviors.

A growing body of research proposes that for individual action to occur there must be a perception by individuals that they are not acting alone, and a belief that their actions will be reciprocated by others (Axelrod, 1984; Lubell, 2002; Scholz & Lubell, 1998a, 1998b). This helps to elucidate a variety of behaviors in activism; when people feel they can actually have an effect on a particular issue, they are more willing to act.

An example of the potential of collective human behavior is carbon emissions in the United States. Without participation by the U.S., the world's leader in per capita carbon emissions, impacts on reducing emissions will be greatly limited (Nordhaus, 2001). It is the collective actions of individuals that can have the greatest influence on CO_2 emissions. It is therefore just as important to gain individual support as it is to gain the support of industry, government and other traditional stakeholders. However, garnering public support for adopting carbon mitigation strategies has been challenging. Climate change remained a politically polarizing issue for many years, separating Democrats and Republicans (Bodner, Speiser, Seeh, & Perkowitz, 2008). To fully

understand U.S. perceptions of climate change and other environmental problems, and the motivations that underlie behaviors, it is necessary to integrate the social sciences and communication strategies into mainstream climate research, as recommended by the United Nation's Intergovernmental Panel on Climate Change (Flores, 2007).

Environmental Problems and Responses

Over the past few years, one of the central topics of politics, policy, and economics has been the potential of a *green* (environmentally friendly) economy. This was a central issue in the 2008 U.S. presidential election, and continues to be used as a talking point in promoting environmental protection and mitigation. A basic premise emphasized in these messages is that technologies and investments that protect the environment can create jobs in a competitive global market, and including the environment in a business plan is more economically sustainable than before. At a consumer level, the purchasing of environmentally conscious products has become a social phenomenon. Products such as the Toyota Prius have given consumers opportunities to make statements of their value on conservation. "Conspicuous conservation" has become trendy, specifically noticeable in the cultural elite where pro-environmental *green* purchasing has become evident in status competition (Griskevicius, Tybur, & Van den Bergh, 2010). In addition, consumers have begun to realize the long-term benefits of green purchasing, as initial benefits pay off over time. Several businesses and corporations have recognized the economic opportunity of *green* marketing. It is evident there are several variables to behaviors such as consumer purchasing, but there is

a lack of evidence building upon the understanding of human behavior. In this study, I will use *green* economic incentives as a frame for one of my research instruments.

The purpose of this study is to assess and compare the impacts of different communication frames, advancing the conversation of conveying messages about the environment. Specifically, this study will compare how social norms and economic benefit frames differently influence individual's intent to undertake pro-environmental behaviors.

<div align="center">Literature Review</div>

Media Influences on Human Behavior

A wide body of research has addressed the formation of public attitudes (Allport, 1937; Birnbaum, 2004; Cohen, Mutz, Price, & Gunther, 1988; Davison, 1958; Mutz, 1989) and communications' influence on attitudes and behaviors (Bandura, 1977; Clark, Kotchen, & Moore, 2003; Cohen, et al., 1988; Davis, 1995; Rothman & Salovey, 1997), but studies have only recently begun to recognize the influence that visual stimuli, specifically documentaries, can have on these variables (Nisbit & Aufderheide, 2009; LaMarre & Landreville, 2009). The introduction of stimuli in this environment, activating and increasing the probability of behavior, has not been typically studied (Bargh & Morsella, 2008). In order to understand how attitudes and behaviors are shaped, we must develop an understanding of communication and explicate the concept of media and its messages, and subsequent influence on society.

Allport (1937) demonstrated a past, but relevant understanding of public attitude. This literature advocates that public opinion as reported by the media does not necessarily reflect a vast public opinion, but rather of the social leaders of a group of

people. The implication of Allports' work was that we must be cautious of what we believe to be broad public opinion, or the opinion of a specific social group.

Davison (1958) proposed attitudes are structured and changed by existing attitudes and members within an individual's society. This implies that most people are products of their environment when it comes to expression of attitudes. That being said, Cohen et al. (1988) argued that people feel others will be more affected by the media than they themselves will be. Political and social leaders use these concepts to their advantage in several aspects of their communication. It is evident that most people join a social group introduced by the press, radio, or television. This factor, specifically social media over the internet, was evident in the 2008 election, where presidential candidates were able to access and motivate individuals not typically in the mainstream of the voting population; a phenomenon that has intrigued the research interest of the social science community (Johnson & Perlmutter, 2009).

Message Framing

One aspect of communication of interest to many researchers is message framing. Reese (2001) stated that frames organize principles that are socially shared and persistent over time that work symbolically to meaningfully structure the social world. Framing in any case is a directional approach of communication, a specific conduit of appeal towards a particular audience. Frames enable us to identify and categorize information and occurrences within particular contexts (Goffman, 1974).

A specific example of message framing is described by Rothman and Salovey (1997). They found the effectiveness of framing in situations involving risk to personal

health depended on the mental state of the audience; specifically, if the audience member views a behavioral choice as *illness detecting* or *health-affirming*. In general, people want to reduce risk when considering potential gains, and are much more willing to take larger risks when considering potential losses. This study can be applicable to environmental communication, as people might be more willing to make a significant change to their environmental behavior when their environmental well-being is harmed, or has the potential to be so; implicating a reactive society.

Pelletier and Sharp (2008) furthered the effectiveness of message tailoring to an audience in their study of intrinsic versus extrinsic costs or benefits of specific behaviors. They stated "self-determined motivation should be enhanced by tailoring messages to the proposed process underlying [behavior] change and by framing these messages as a function of the intrinsic versus the extrinsic costs or benefits of a [behavior]" (pp. 210).

Researchers must use caution while using risk frames, as without continued pressure to address a particular issue, people may become defensive in order to avoid the fear associated with a particular issue, eventually decreasing the initial persuasion of a message (Leventhal, 1970). Once someone is aware of an issue, any other information to enhance the risk or fear emotion will have only minimal impact on behavior, and in fact may only increase the amount of fear (Rothman & Salovey, 2007). In short, messages aimed to elevate emotions are only valuable if they have significant information aimed to ease unwanted feelings (Pelletier & Sharp, 2008).

Davis (1995) explored communication frames in three segments; the problem, the target audience, and recommended mediations. The problem was framed as a loss or gain, the target audience as affecting current or future generations, and the recommended

actions as taking less or doing more in reference to recycling. They found that frames affecting current generations produced the greatest levels of intentions to partake in PEB's, and activity framing did not exercise any pressure on attitudes or behavioral intentions.

Durfee (2006) analyzed the impacts of message framing in newspaper articles and advised framing environmental issues around a social change perspective has a greater impact on an audience's perceived risk than status quo frames. This study also corroborated in the literature review what Davis' (1995) work indicated previously, that environmental action is best promoted when clearly stated, simple, and does not involve a great change to current lifestyle. Communication research must build from Durfee's work, so that science may establish relevance and connect to its target audience.

Social norm and economic frames have been used independently to test their effects on behaviors, but my review of the literature did not find empirical studies directly comparing them with one another, only a review articulating their convergence within the social sciences (Turaga, Howarth, & Borsuk, 2010). Social norm frames have typically communicated that a majority of people within a specific location behave a certain way (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007; Schultz, Khazian, & Zaleski, 2008). In this frame, when targeted individuals enter the locality, whether it be a neighborhood or hotel room, they are made aware of the subjective social norm, and conformity is a desired outcome. Economic frames have been described as having low or zero cost or attractive profits on a particular behavior or technological adoption (Dietz, Gardner, Gilligan, Stern & Vandenbergh, 2009; Thogersen, 2009).

Behavior change

In order to assess the potential impacts of message framing, we must explicate the concept of the process of behavior change. Pelletier and Sharp (2008) concluded that people experience detection, decision, and implementation phases of behavior change. They recommended that messages be tailored to address the appropriate phase of the target audience in order to optimize the likelihood of desired impact on an individual's behavior. The implications of this research for environmental communicators are apparent; messages must be relevant to the specific phase of the target audience. The nature of messages provoking a desired response action has been studied for some time within marketing, where advertisements are designed to prompt product purchasing.

In their study about green marketing technique and strategy, Ottman, Stafford and Hartman (2006) concluded that framing messages appropriately to an audience resulted in greater support for environmentally sustainable products. In addition, their study revealed that individuals have become more and more trusting of their social networks, and marketing campaigns have subsequently adapted to this phenomenon with goals of creating an intense dialogue, or *buzz*, among online communities (Rosen, 2000). Individuals are more likely to adapt a certain behavior, such as product purchasing, when they feel they are acting upon information derived from an interactive social group, and feel to have a connection to a product or social movement of a behavior that benefits them (Ottman, Stafford, and Hartman, 2006).

Ajzen and Fishbein (1980)'s approach to behavior change proposes that it is rooted in a combined influence of beliefs, attitudes, subjective norms, and behavioral intentions. Although the authors have conducted extensive research on the influence of

norms on behavior, as described below, they do not explicitly include value orientations. Schwartz (1977) overtly includes values in a model of behavior and proposes that the greater the importance norms and values are to an individual, pertinent to a particular behavior, the greater the feeling of personal responsibility to act. This suggests that values and norms both influence behavioral intent.

Social Norms

Definitions in sociology articulate that norms are prescriptive, addressing behaviors acceptable within a social context, and have sanctions associated with them to ensure conformity (Homans, 1950; Blake & Davis, 1964; Cancian, 1975; Rossi & Berk, 1985; Biddle, 1986). Social norms have been identified as a key factor in predicting and explaining human behavior, including environmental behaviors (Shelby & Vaske, 1991)

A growing body of research has indicated the power of social and cultural norms. Since the introduction of Fishbein's (1967) theoretical model of behavioral intentions, debate and discussion became popular among the associated research community. The influence of values, norms, and attitudes on behavior has been researched for some time. Guiding research specifically, has focused on the Theory of Reasoned Action (Fishbein, 1967; 1973; 1980; Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) and Theory of Planned Behavior (Ajzen, 1985; 1987), proposed that norms influence behavioral intentions within a cognitive hierarchy. Because norms help create social order, we can therefore use it as an instrument to behavioral modification, as previous studies have demonstrated.

Schultz et. al., (2007) study of normative social influence of energy use in the home concluded that normative messages can be used as an instrument for behavioral change, but that caution must be taken in function to achieve a desired outcome. They found that when residents were exposed to information about their energy use in comparison to other neighborhood residents, energy consumption declined among residents above average energy use, but in some cases increased among consumers below average consumption within the neighborhood. This implies that people may become too comfortable if they are within a positive threshold of a social norm, not being pressured for modified behavior. In another study testing social norm messages as a behavioral instrument, Schultz, Khazian, & Zaleski (2008) found a decline in towel use among hotel guests when social norm messages were used on a door handle sign.

This review of literature influenced the hypotheses for this study which state that:

H_1: Environmental values will significantly predict social norms and behavioral intent related to environmental behaviors.

H_2: Communication messages framed around environmental social norms will have greater influence on environmental behavioral intent than messages with an economic frame.

Methods

Overview

This on-line study sought to identify the effects of two differently-framed videos on individual environmental values and behavioral intent. Two videos were created, one framing environmental sustainability as an economic opportunity, and the other as a

social norm (Figure 1). A web page was designed to host the videos and to direct

participants to the survey questions about the video they viewed. Site visitors were

prompted with simple instructions upon entering the site. First, they were instructed to

watch a randomly selected video. Following the video, they were provided a link to the

survey. The survey consisted of questions to analyze the values, subjective norms,

behavioral intentions, and demographic information of participants.

Figure 1 about here

Sample

Five people of diverse backgrounds were initially selected based on their

extensive social media networks (at least 190 people), demographics and geographic

location. The five people lived in Washington D.C., Maryland, Virginia, Florida, and

Colorado, ranged in age from 21 to 47, varied in occupations from a college student to

Legal Assistant to nature blogger/writer, and represented a diversity of political and

environmental values and affiliations. The racial composition included people who are

Caucasian and Black/African American. Representatives were asked to send a message to

their networks that encouraged their participation. Each recipient of their message was

asked to also send the study to their respective contact lists and networks.

A second on-line approach was used which included placing an ad on the

Facebook social media site. In this approach, the ad was displayed 348,174 times on

randomly selected Facebook pages encouraging viewers to participate by the chance to

win a $150 gift certificate to a popular on-line merchant. The ad was posted for a total of

three months on up to 68,745 Facebook pages each day.

Video

      Each of the videos were approximately five minutes in length. They were

consistent in terms of behavioral themes, and included some of the same footage. The

two videos were framed differently, however. One video used an economics frame in

which it concentrated its message around cost-savings and the potential for collective

consumer action to support the emerging green economy. Statements expressing the

amount of money saved on energy use or grocery bills were used to establish this frame.

The second video attempted to establish a perceived social norm, with a goal of the

viewer feeling a social pressure to consider the environment in everyday actions, and that

the *norm* is to do so. This was done with statements expressing that a high number of

people are engaged in sustainability that likely includes their neighbors, co-workers and

friends, and showing several individuals and businesses engaged in and expressing why

they participate in these activities.

Survey

      A 41-item on-line survey was administered following the video. The survey

assessed respondents environmental values, subjective norms, behavioral intentions in

response to the video they watched, demographic information, and intentions and means

to share the study with those in their social network. Most items were measured on a

Likert Scale of 1 (strongly agree) to 7 (strongly disagree). The variables of interest for

this study – behavioral intent, subjective norms, environmental values – were scales

comprised of a set of individual survey items. Behavioral intent included six-items that

asked respondents the frequency with which they intend to enhance the health of the

environment, support environmentally friendly companies, and purchase environmentally

sustainable products.

Environmental values were measured on a seven-item anthropocentric/biocentric

Likert Scale of 1 (strongly agree) to 7 (strongly disagree) measuring the perceived value

of nature, the role of humans in nature, and natures influence and role within the

economy. Seven-items measured subjective norms of individuals. Questions asked

respondents about their social network of family and friends, and their perceptions of

those around them.

Analysis

Data was entered and analyzed using the Statistical Package for the Social

Sciences version 18. Descriptive statistics, reliability analyses, independent sample t-tests

and regression analyses were conducted.

Results

A total of 69 individuals participated in the study over a seven-month time period.

Respondents varied geographically, representing three countries, 50 different U.S. zip

codes from 22 states and regions that included rural, urban and suburban locations. A

majority of respondents were highly educated. More than 43% held a four-year degree

and 43.1% had a professional or graduate degree. In terms of income levels, 45.2% of

respondents reporting an annual household income between $50,001 and $100,000. The

age of respondents ranged between 20 and 89. Most respondents (56 individuals, 87.5%)

reported being Caucasian/White.

Reliability analyses were conducted to determine if single items could be grouped to create scales of interest (e.g., environmental values). Table 1 shows the results of this analysis for the subjective norm questions. A Cronbach's alpha of .813 as well as other indicators (i.e., inter-item total correlation, alpha if item deleted) indicated a strong relationship between survey questions, and they were subsequently grouped into a single variable. All variables were retained in the final scale for subjective norms.

Table 1 about here

A second reliability analysis was conducted to determine if questions of value orientations could be grouped (Table 2). A Cronbach's alpha of .803 indicated a strong relationship and the questions were grouped into a single-item indicator. All variables were retained in the final scale for values.

Table 2 about here

In order to determine if respondents who viewed the two videos were similar in value orientations and subjective norms, a chi-square analysis and t-test were performed (Table 3). Results indicated respondents did not significantly (p>.05) differ. This indicates that the two groups were similar prior to viewing the videos.

Table 3 about here

For the first hypothesis a regression analysis was conducted with environmental values as the independent variable and subjective norms as the dependent variable. The results indicate that there was no significance in this model (see Figure 2). Hypothesis 1 is rejected.

Figure 2 about here

In order to determine if respondents significantly differed in their behavioral intentions based on which video they viewed, a chi-square analysis and t-test were performed. In both instances there were no significant differences (p>.55; see Tables 4 and 5) between the two groups. I reject my second hypothesis.

Tables 4 and 5 about here.

Discussion

Previous studies have tested the influence of social norm messages within a specific context, testing influence on a specific behavior (Schultz et al., 2007; 2008). A review of the literature in this study did not reveal substantial research about the influence of normative messages on a broad array of environmental behavioral intentions. The intent of this study was to provide the viewer exposed to a visual stimulus with an arrangement of environmentally sustainable behaviors, and allow the viewer to digest the information provided, and then intend to amalgamate selected behaviors into their personal lives.

The results in this study indicated that videos had an effect, although slight, on their intentions of overall environmental behavior, consumer purchasing, and attention to *green* companies. This effect did not differ based on which video was viewed, recommending that there is potential for both frames to influence behavioral intentions. The influence on behavioral intentions to reduce travel emissions was the lowest for participants from both groups. This might be explained by the culture of transportation and travel in the United States. Modes of transportation among the American public are a sign of status, freedom, and convenience. Changing how we get to the workplace or how we run errands can require more than simply changing one's mind. Those changes may

require public transport; moving closer to workplaces and schools, and so on. Many of the other advised environmental behaviors in the videos were relatively easy in many respects (e.g., buying a different kind of light bulb) compared to changing travel behavior. As Davis' (1995) noted, behaviors that require a substantial change in lifestyle are difficult to achieve. This finding pertaining to travel emissions is consistent with this study.

Building off of this, I speculate that the reason I found no differences in terms of the strength of this behavioral influence is that people are increasingly recognizing both the economic benefits of environmental behaviors, as well as feeling the trend of more and more people doing such behaviors. Such implications imply these individuals may be in tune with the social, sustainable, and economical aspects of sustainability.

Overall, both groups of video-watchers indicated a slight or neutral influence on their intended behaviors. The implications of this finding do not necessarily diminish the potential influence of the frames. Since the majority of survey participants indicated strong environmental values and social norms, we can expect that many of them were already engaged in sustainable behaviors. Consequently, the influence of a video is limited. A pre/post test methodology in this case would produce results from which we could make this determination.

As discussed previously, past research has shown a positive relationship between values and norms (see Schwartz, 1977). However, this study did not show such a relationship. The values-norms relationship was not significant and the Beta coefficient for values was minimal (.04) and insignificant (p >.739). This finding is difficult to explain; it is at odds with an abundance of previous research, as it did not hold up in my

study. However, the participants in this study may not represent a cross-section of the

population. Given the strength of their environmental values, this sample may be less

influenced by social norms and more influenced by adhering to and acting consistent with

their values. Further, it is possible that the sample size of this study was insufficient to

detect the values-norms relationship as I would have expected it to be.

Limitations

One of the main objectives of this study is to build upon previous framing

research. Here, I discuss the limitations of this particular study, and provide

recommendations for future research. Particular limitations to the study include sample

size and the production quality of the videos. Pertinent to my study, a small sample size

may have had the most significant influence on my results. Acquiring a different, more

substantial and diverse sample will allow the researchers to more effectively test the

influence of these particular videos.

I find my conflict with sample size consistent with Couper (2001), who

articulated a chief issue with Internet surveys. Low response rates and a lack of coverage

of a population are common for Internet surveys. There is consequently a question to

whether or not results from such surveys can be adjusted and effectively analyzed

statistically.

Messages within a video environment are extremely complex. Viewers interpret

and analyze verbal and visual meanings differently. It is imperative to recognize this

intricacy, as interpretation adds to the variables determined by researchers. The videos

produced by researchers were screened to university students and faculty. For the second

wave of response collection, an open-ended survey question was added to collect information on participant reaction to the video viewed, and allowed a space where participants could freely comment on their research experience.

Reactions to the videos in a public-screening setting were greatly different. Most viewers were generally pleased with the frames, expressing their divergence from status quo frames. One individual had a reaction to subtle ques in the video, not previously recognized by the researcher. In one scene of the norm video, a lady is speaking of her value orientation, and why she considers the environment with her actions. An exotic bird was in her lap, previously considered a connection to animals, but the viewer's interpretation was a lack of sensitivity to the transportation of exotic animals: an unsustainable behavior. This interested the researchers in that viewers pay attention to every detail of a video, or a study; interpreting and continuously reflecting upon their experience within an activity.

Most reactions in the confidential on-line survey interpreted the videos were positive, expressing the videos ability to "capture and hold" attention, providing "useful information" in efforts to perform environmentally sustainable behaviors such as unplugging appliances when not in use. Negative reactions, although few, consisted of comments criticizing the video watched as providing juvenile information of sustainable behaviors, or that the videos only reiterated behaviors common in most sustainability campaigns. Although behavioral research advocates the importance of repetitive messages, comments such as these further support a necessity to provide viewers of environmental messages with new, innovative, and fun ways to behave sustainably. A limitation to this study was the production value of the videos.

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Conclusion

Research on framing has opened doors to questions that demand interdisciplinary involvement. This research sought to advance the conversation pertaining to problems along the social side of a many environmental issues and integrate innovative research methodology to explore the depths and possible directions of social science research. It is up to a collective society to support new policies and individual behavioral change. In order to reach this solution, research must attend to questions that address concepts such as behavioral change, public opinion, and knowledge acquisition. Studies of message framing have brought light to the power and influence of communication. In this exploratory study I examined the influence of message tailoring and framing on sustainable behaviors, testing the potential influence of messages indicating a social norm. Although my results did not support previous research indicating a relationship within the values-norms-behavioral hierarchy, I do not diminish their relationship, nor reject the potential influence of normative communication. I also find importance of specificity within messages, further isolating variables within visual experiments.

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Tables and Figures

Table 1. A reliability analysis of subjective norm questions.

Survey Question	Corrected Item-total Correlation	Cronbach's Alpha if item deleted
Most of my friends behave responsibly toward the environment.	.581	.796
The health of the environment is important to the people around me.	.489	.813
I would consider the people in my close social network to be environmentally conscious individuals.	.763	.693
Individuals in my social network are concerned about the health of the environment.	.713	.717

Overall Alpha = .805

Table 2. A reliability analysis of value orientation questions in respect to an anthropocentric / biocentric scale.

Survey Question	Corrected Item-total Correlation	Cronbach's Alpha if item deleted
The primary value of nature is to generate money.	.609	.762
The needs of humans should take priority over environmental protection.	.701	.699
Nature's primary value is to provide products useful to people.	.610	.763
The value of nature is only in the human mind. Without people, nature has no value.	.583	.761

Overall Alpha = .798

Table 3. Differences in individuals with video type.

Survey item	Video Frame		F	p-value	Eta
	Norm Video	Economics Video			
Subjective Norms	2.37	2.83	3.795	.056	.233
Anthropogenic Values	5.67	5.72	.020	.888	.017

Table 4. Percentage of people whose behaviors were influenced by a particular video

Survey Item	Frame		χ^2	p-value	Phi
	Social Norm (Video A)	Economic (Video B)			
Influence Environmental Behaviors	62.5%	46.4%	1.726	.221	-.159
Influence Consumer Purchases	45.0%	53.6%	.484	.623	.048
Purchase products from green* companies	50.0%	53.6%	.084	.809	.035
Reduce Travel Emissions	35.0%	42.9%	.431	.614	.080

*"Green" indicates environmental sustainability.

Table 5. Video Influence on environmental behavioral intentions.

| Survey item	Video Frame		F	p-value	Eta
	Norm Video	Economics Video			
Infl. on *env. behaviors	3.35	3.89	.180	.673	.186
Infl. on consumer purchases	3.60	3.82	.597	.442	.073
Buy from green companies	3.58	3.61	.000	.990	.010
Reduce Travel Emissions	3.83	3.75	.679	.413	.030

*env. = Environmental

Figure 1. Rubric identifying the structure of the frames used in the videos.

Question	Social Norm Frame (Video A)	Economics Frame (Video B)
What's the problem?	Conserving resources.	Preserving ecosystem services.
Who's at risk?	Everyone	Individuals not taking advantage of green* economic tips.
What's responsible?	Everyone	Individual behaviors and purchasing. Product development and production.
What's the solution?	Join the majority of people and businesses searching to eliminate their own sources of environmental impact. Purchase green products and collectively support a greener planet.	Individual behaviors that will save money and conserve resources. Green technology to reduce resources use.

* "Green" describes environmentally sustainable actions.

Figure 2. Regression analysis comparing variables

Norms

.041

-.053

Values

Behavior

.016
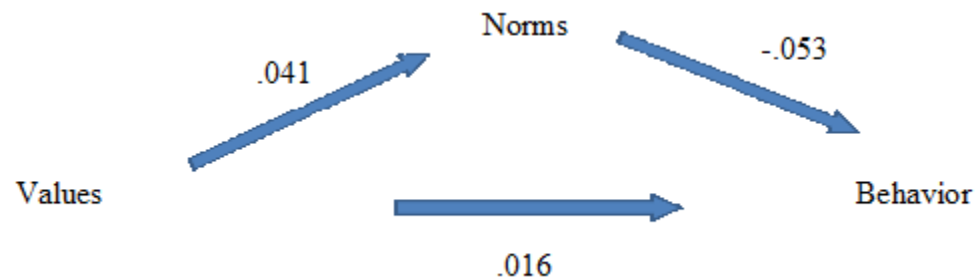
Values and Norms $r^2 = .002$
Overall $r^2 = .003$