Assessing the Content of Online Agricultural Awareness Campaigns

Joy N. Rumble

Quisto Settle

Tracy Irani

Assessing the Content of Online Agricultural Awareness Campaigns

Abstract

This study explored the content of online agricultural awareness webpages. Content analysis was used to determine the content, image categories, messaging appeals, and frames used. The majority of the pages included images and logos, but they were less likely to include other media components, such as social media plugins. The most prevalent image types were non-farming adults, positive food products, fields, and free-roaming animals, though they were included in less than one-third of the pages. The use of non-farming adult images is likely connecting to a consumer audience, while the images of positive food products, fields, and free-roaming animals are likely providing contextual, cultural, or direct meaning to the viewers. Logical appeals were more prevalent than emotional appeals. The primary use of logical appeals could be limiting webpage effectiveness because emotional appeals are known to create stronger connections with audiences and be remembered. The most prevalent frames were agricultural education and economic. Previous literature indicates that education-only communication is traditionally less effective as consumers consider more than facts when making decisions. It is recommended that agricultural communicators pre-test webpages with target audiences prior to launch, utilize webpage planning to better reach target audiences, and conduct formative evaluations of webpages to assess effectiveness and make any needed adjustments. Additionally, it is recommended that agricultural communicators incorporate more emotional appeals into their communication messages. Future research should continue to assess online agricultural awareness information as well as the impact the information has on a consumer audience.

Keywords

Agricultural Awareness Campaigns, Agenda Setting, Content Analysis, Framing, Messaging Appeals

RESEARCH

Assessing the Content of Online Agricultural Awareness Campaigns

Joy N. Rumble, Quisto Settle, and Tracy Irani

ABSTRACT

This study explored the content of online agricultural awareness webpages. Content analysis was used to determine the content, image categories, messaging appeals, and frames used. The majority of the pages included images and logos, but they were less likely to include other media components, such as social media plugins. The most prevalent image types were non-farming adults, positive food products, fields, and free-roaming animals, though they were included in less than one-third of the pages. The use of non-farming adult images is likely connecting to a consumer audience, while the images of positive food products, fields, and free-roaming animals are likely providing contextual, cultural, or direct meaning to the viewers. Logical appeals were more prevalent than emotional appeals. The primary use of logical appeals could be limiting webpage effectiveness because emotional appeals are known to create stronger connections with audiences and be remembered. The most prevalent frames were agricultural education and economic. Previous literature indicates that education-only communication is traditionally less effective as consumers consider more than facts when making decisions. It is recommended that agricultural communicators pre-test webpages with target audiences prior to launch, utilize webpage planning to better reach target audiences, and conduct formative evaluations of webpages to assess effectiveness and make any needed adjustments. Additionally, it is recommended that agricultural communicators incorporate more emotional appeals into their communication messages. Future research should continue to assess online agricultural awareness information as well as the impact the information has on a consumer audience.

KEY WORDS

Agricultural Awareness Campaigns, Agenda Setting, Content Analysis, Framing, Messaging Appeals

INTRODUCTION

Previous scholarly work has said the general public needs a basic understanding of agriculture to make informed decisions about agricultural and natural resource issues (Frick, Birkenholz, & Machtmes, 1995; Meischen & Trexler, 2003). However, expecting the public to have the level of understanding necessary to make informed decisions about agriculture is seen by some as unfeasible due to the disconnect between the general public and production agriculture (Powell & Agnew, 2011).

As industrialization and urbanization have progressed, the number of individuals involved in farming has greatly decreased. The 2012 Census of Agriculture reported 3.2 million farmers caring for 2.1 million acres of United States

farmland (United States Department of Agriculture [USDA], 2015). The total number of farmers in 2012 was down 3.1% from 2007 and equated to just more than 1% of the United States' population (United States Census Bureau, 2015; USDA, 2015). As U.S. consumers have become further removed from the farm and agricultural technologies have continued to advance, consumers have developed concerns with modern agricultural practices and technologies (Weatherell, Tregear, & Allinson, 2003). The agricultural industry has not adequately addressed the concerns of consumers and thus has struggled to integrate production and consumption needs (Goodman & DuPuis, 2002; Weatherell et al., 2003). Failing to address consumers' concerns is due in part to the agricultural industry's historical tendency to communicate with others involved in the industry (Telg & Irani, 2012).

The ever-widening disconnect between consumers and the agricultural industry has prompted many agricultural communicators to retarget their communications to a consumer audience (Telg & Irani, 2012). To increase the amount of agricultural information the public receives, as well as increase the awareness surrounding agricultural issues, many agricultural professionals have been turning to the Internet (Goodwin, Chiarelli, & Irani, 2011). The Internet has allowed agricultural professionals to advocate for the industry while connecting with the public (Advocates for Agriculture, 2007; American Farm Bureau, 2003; Ohio Farm Bureau, 2009; Radke, 2009). The Internet has the potential to reach a large consumer audience, as 85% of all American adults are online (Anderson & Perrin, 2015). Additionally, 91% of adults on the Internet use search engines to find information (Purcell, Brenner, & Rainie, 2012). The Internet provides many outlets for the agricultural industry to communicate to the public about agricultural issues. However, the impact on public understanding and the ability to make informed decisions depends on the content and accessibility of online agricultural information. Given the need for the public to be informed on agricultural topics and the increasing use of the Internet by agricultural professionals to communicate about agriculture, the purpose of this research was to explore the content of online agricultural awareness webpages.

LITERATURE REVIEW

Several studies have assessed the content of online agricultural information. While some studies have compared pro- and anti-agricultural websites (Abrams & Meyers, 2012), others have examined the agricultural content of online information (Goodwin & Rhoades, 2011; Rhoades & Ellis, 2010), and some have examined the online accessibility of agriculturally related information (Boyne & Hall, 2004).

Abrams and Meyers (2012) compared the persuasive content on the websites of two non-profit organizations with opposing views on animal agriculture. The researchers assessed the amount of information for each animal agriculture topic, sources, images and multimedia, and the frequency of pre-determined frames on each website. The opposing organization provided more information, science-based sources, photos, and videos. Many of these photos and videos included anthropomorphized animals. The supporting organization provided more downloadable presentations. The opposing organization used more animal welfare frames, while the supporting organization used more health frames in their communication. The authors concluded that the opposing organization provided information that appealed to audiences with low or high involvement in animal agriculture issues, while the supporting organization provided information that appealed to audiences of only high involvement (Abrams & Meyers, 2012).

In a study aimed at increasing public awareness of rural food and tourism activities in the United Kingdom through online information, Boyne and Hall (2004) found that the search terms used by a potential visitor were not present in the rural tourism websites and were causing the websites to be overlooked or not found at all. The authors recommended that the design and organizations of the websites be reconsidered in order to increase the awareness of rural food and tourism opportunities. Without improvements to the accessibility of the online information, the authors worried that the ability to create a rural brand and to capitalize on potential economic benefits of rural and food tourism would be hindered (Boyne & Hall, 2004).

Rhoades and Ellis (2010) assessed the food safety topics, credibility, and frames of food safety information delivered through online food safety YouTube videos. The results identified that the videos covered both simple and complex food safety topics such as hand washing and metabolic profiling. Additionally, the researchers found that amateurs, universities, and corporations were creating the video content. Frames covered in the videos included cooking, chilling, bacteria, leftovers, handling, and other frames including local food and genetically modified organisms. The authors recommended that food safety educators use the results of the study to understand what complementary or competing information youth may be accessing related to food safety, in order to strategically develop future food safety messages and educational methods (Rhoades & Ellis, 2010).

Following the methods set forth by Rhoades and Ellis (2010), Goodwin and Rhoades (2011) examined the content of YouTube videos related to California's 2008 Proposition 2, a proposition putting restrictions on the housing of gestating sows, laying hens, and veal calves. The researchers examined the videos for sponsorship, demographics of those featured in the videos, and the messaging appeals used. Of the videos analyzed, 89.3% supported the proposition, 3.9% opposed the proposition, and 6.8% took a neutral stance. Emotional appeals were frequently presented in the videos with the appeals of guilt, empathy, and promise used most often. Goodwin and Rhoades concluded that agricultural communicators should incorporate more emotional appeals into their communication in order to connect with and persuade voters.

Conceptual Framework

The effectiveness, and ultimate success, of agricultural awareness information relies on adequate message content and delivery (Elder et al., 2004). The adequacy of the message content can be impacted by the presentation of the information, the sources, the appeals and frames, and the images used to communicate the message. Communication messages that deliver education-only and fact-based information have traditionally been less effective when reaching the target audience as individuals consider more than logic when making decisions (Durkin, Beiner, & Wakefield, 2009). Additionally, the message content should be based on expert opinions, scholarly research, and have a theoretical foundation (Elder et al., 2004; Randolph & Viswanath, 2004). The audience's perception of the communication message will be influenced by how credible they believe the source to be (Eastin, 2001).

In the social sciences, it is common for messages to be created through the use of framing (Randolph & Viswanath, 2004). Framing allows for information to be presented from a certain perspective and thus influence how the recipient will process the information (Scheufele & Tewksbury, 2007). Another strategy used to influence how the information is processed is the incorporation of messaging appeals into communication messages (Atkin & Salmon, 2010). Commonly, messaging appeals fall into the categories of logical or emotional (O'Guinn, Allen, & Semenik, 2003; Srivastava & Sharma, 2008). Logical appeals communicate with reason, while emotional appeals are more subjective and require interpretation (O'Guinn et al., 2003; Zinn & Manfredo, 2000). Previous research has shown that both categories of appeals have similar influence, but emotional appeals are more likely to connect with and be remembered by the audience (Srivastava & Sharma, 2008; Zinn & Manfredo, 2000). When individuals are able to relate or emotionally connect with a message, they are more likely to incorporate the information to their cognitive structure (Nabi & Oliver, 2010).

The presence of images in communication messages can be used to gain audience attention, provide meaning to written text, and to educate, inform, or persuade (Telg & Irani, 2012). Images allow individuals to make meaning of a message based on historical, cultural, or contextual experiences, but images also allow individuals to examine the direct meaning being communicated (Moriarty, 2005; Rose, 2007). The use of stereotypical images has been shown to add to comprehension among the target audience, allowing simple connections to be made (Tversky & Kahneman, 1974).

Message delivery is also essential to communication effectiveness as the target audience must be exposed, attentive, and able to comprehend the information provided (Elder et al., 2004). Two variables that affect the success of the message delivery include placement control and quality of the information (Elder et al., 2004; Haskins, 1985). Placement control consists of ensuring that the message is accessible to the target audience and that the frequency of exposure is adequate

(Elder et al., 2004; Palmgreen & Donohew, 2006). This includes selecting the appropriate media channels for the target audience (Atkin & Salmon, 2010). Quality information often contains favorable attributes and images that connect on a personal level and are attractive to the target audience (Jacobs & Shapiro, 1994; Sniderman, Glaser, & Griffin, 1990). Additionally, the messages must be noticed and accessed by the audience (Randolph & Viswanath, 2004). To ensure that adequate content and delivery is achieved, it is recommended that communication messages be pre-tested prior to launching with a target audience (Elder et al., 2004).

PURPOSE & OBJECTIVES

The purpose of this study was to explore the content of agricultural awareness information presented on webpages. The exploration of these webpages should allow agricultural communicators to understand messages and content being communicated to the public by the industry. The webpages were assessed through the following objectives:

1. Determine the media content used by agricultural awareness webpages, and
2. Determine the messaging appeals and frames used on agricultural awareness webpages.

METHODS

To determine content used in existing agricultural awareness webpages, a quantitative content analysis was performed. A content analysis is a "research technique for the objective, systematic, and quantitative description of the manifest content of communication" (Berelson, 1952, p. 18). Babbie (2010) added that analysis of latent content is also important. Manifest content is recognized as content that is readily apparent, while latent content requires interpretation (Holsti, 1969). Content analyses are used by researchers to measure frequency of communication symbols as well as make descriptions and inferences from the communication (Riffe, Lacy, & Fico, 2005). Additionally, content analyses are often used to study computer-based content, such as webpages (Ary, Jacobs, & Sorensen, 2010).

The sample of agricultural awareness webpages was obtained in summer of 2011. The researchers attempted to pull a sample of agricultural awareness webpages from each U.S. state, in order to understand how agriculture was being communicated nationally. The webpages were identified by using the search terms "agriculture awareness, 'Alabama.'" "Alabama" was replaced for each respective state search. The search engine used for the study was Google, which accounts for the majority of search engine market share (Netmarketshare, 2012) and is the search engine used by the majority of online adults (Purcell et al., 2012). The first five agricultural awareness webpages in the resulting state search were added to the sample. The researchers elected to focus on the first five usable webpages in each search because research has identified that 87% of Internet users click on the top five listings on a search page (Kantar Media Compete, 2015); however, limiting the analysis to the first five webpages in each search is a limitation to this study. Links were excluded if they were PDF documents, news stories or press releases, duplications of links that had already been included, links that appeared in the search results after the second page, or not related to agriculture. Links appearing in the search results after the second page were excluded as previous literature has indicated that users rarely click through several pages of search results (Höchstötter & Lewandowski, 2009). Several states had less than five usable links to contribute to the sample, and Delaware did not yield any usable results. It is important to note that anti-agriculture webpages were not excluded from the search results, as the researchers wanted a holistic picture of what a user may find if searching for agricultural information.

The initial sample included 166 agriculture awareness links. During the coding of the webpages, an additional 15 links were dropped from the sample due to broken links, irrelevant content, and PDFs, as well as duplicates that were overlooked in the initial sample. The final sample included 151 webpages.

The webpages were analyzed using a coding sheet developed by a panel of experts consisting of university faculty and

industry communicators. A coding sheet leads the researcher through the analysis process and is where data about the content are recorded (Riffe et al., 2005). Data collected on the coding sheet relative to the media content in objective one included the webpage name, type of webpage (i.e., homepage or second-tier page), URL extension (e.g., .com, .org, .edu, etc.), presence of images, image content, types of media components (e.g., social media plugins, interactive elements, and visual elements including logos, videos, PDF, games, etc.). The content of the images was coded for the presence of different agricultural and natural resource components such as people (e.g., farmer, non-farming adults, farm children, etc.), agriculture (e.g., fields, barns, tractors, etc.), environmental and natural resources (e.g., water, timber, wildlife, etc.), and animals (e.g., free roaming, anthropomorphized, confined, etc.). These possible components were established a priori with the input of a panel of experts.

The coding sheet also collected data relative to objective two including emotional and logical appeals, calls to action, and pre-determined frames. All coding for manifest and latent content was recorded numerically (Babbie, 2010). Most of the recorded data was manifest content; however, the image content, appeals, and frames were latent content and thus required subjective interpretations by the researchers (Lombard, Snyder-Duch, & Bracken, 2002). The emotional and logical appeals used in this study were suggested by O'Guinn et al. (2003) and previously used by Goodwin and Rhoades (2011). The emotional appeals included guilt, emotional, promise, empathy, humor, threat, fear, pride, and sex. The logical appeals included rhetorical question, self reference, gain, loss, informative social modeling, and irony. The pre-determined frames used in this study included frames previously used, in part, by Lundy (2004) and Abrams and Meyers (2012). These frames included moral norms, opportunity for all, prevention, economic, environmental, local food, animal welfare, and agricultural education. In addition to the coding sheet, a coding guide was developed to define the variable categories and ensure consistent coding (Riffe et al., 2005).

To obtain inter-coder reliability, and thus validate the study (Lombard et al., 2002; Potter & Levine-Donnerstein, 1999), two coders underwent coder training and coded a randomly selected 10% (n = 16) of the sample. The reliability measure Cohen's Kappa was calculated for each variable to ensure coder consistency. Coders were re-trained twice before a desirable reliability was achieved for all variables. It is common for several drafts and refinements to be made in coding process (Riffe et al., 2005). All variables had a Kappa score of .64 or higher, with an average Kappa score of .90. Lombard et al. (2002) indicated that a reliability score of .80 or higher is seen as favorable, with .70 acceptable in exploratory studies. Additionally, reliability measures for Cohen's Kappa are more liberally accepted, as it is a more conservative measure (Lombard et al., 2002). Once reliability was reached, the remaining sample was divided evenly among the coders. Coding was completed within two weeks. After coding had been completed, data were entered into Microsoft Excel and analyzed for basic descriptive statistics using SPSS.

RESULTS

Of the 151 agricultural awareness webpages that were analyzed, 98 (65%) were second-tier pages and 53 (35%) were homepages. Additionally, 86 (57%) of the webpages had a URL extension of .org, while 35 (23.2%) had a URL extension of .com. The URL extensions of .edu, .gov, .net, and .info appeared fewer than 14 times each in the sample.

Objective 1: Determine the media content used by agricultural awareness webpages.

To determine the media content present on the webpages, the presence of media links, interactive elements, and images were assessed. Of the 151 webpages, 110 (72.8%) included a logo. The results showed that a limited number of the webpages were using social media plugins, including Facebook (*n* = 63, 41.7%), Twitter (*n* = 50, 33.1%), YouTube (*n* = 19, 12.6%). Other media and interactive content can be seen in Table 1.

Table 1

Frequency of Media Content on Agricultural Awareness Webpages

Media Component	f	%
Logo	110	72.8
Facebook plugin	63	41.7
Twitter plugin	50	33.1
PDF link	28	18.5
Video link	25	16.6
Other	20	13.2
YouTube plugin	19	12.6
RSS plugin	19	12.6
Slideshow link	11	7.3
Blog link	10	6.6
Audio	7	4.6
Flickr plugin	6	4.0
Games	3	2.0
PowerPoint link	2	1.3

Note. Values add up to more than 100% as each webpage was coded for multiple media content.

Additionally, 118 (78.1%) webpages included images. Images featuring non-farming adults were seen on 47 (31.1%) of the webpages. This included images of adults in a non-farm setting or adults not dressed in stereotypical farm attire. Positive food products (n = 48, 31.8%), which included normal appearing food, meaning it was free of evidence of spoilage or abnormal characteristics, and fields (n = 46, 30.5%) were the most common traditional agriculture components to appear in the images. The inclusion of environmental or natural resource components seldom appeared in the images. Water was the most prevalent environmental or natural resource component and appeared on 15 (9.9%) webpages. Free-roaming animals were also seen on 43 (28.5%) of the webpages. Table 2 details all image content found on the webpages.

Table 2

Image Content on Agricultural Awareness Webpages

Image Component	f	%
People		
Non-Farming Adults	47	31.1
Non-Farming Children	27	17.9
Farmer	21	13.9
Farmers Working	17	11.3
Non-Farming Families	14	9.3
Farm Families	12	7.9

Farm Children	5	3.3
Agriculture		
Positive Food Products	48	31.8
Fields	46	30.5
Barn	26	17.2
Tractor or Other Implement	22	14.6
Pastures	19	12.6
Silo	14	9.3
House	9	6.0
Crops Being Harvested	7	4.6
Green House	4	2.6
Orchards	2	1.3
Negative Food Products	1	0.7
Environmental & Natural Resources		
Water	15	9.9
Timber or Forestry	13	8.6
Invasive Species	10	6.6
Wildlife	3	2.0
Biofuels	2	1.3
Animals (Excluding Wildlife)		
Free Roaming Animals	43	28.5
Anthropomorphized Animals	15	9.9
Both Free & Confined Animals	12	7.9
Confined Animals	2	1.3

Note. Values add up to more than 100% as each webpage was coded for multiple image components.

Objective 2: Determine the messaging appeals and frames used on agricultural awareness webpages.

To assess how the content of the webpages might be appealing to the public, the researchers looked for emotional and logical appeals. Some webpages included both emotional and logical appeals. For example, the ABCs of Farm Safety Webpage from the Montana Farm Bureau (n.d.) included an emotional appeal with empathy as well as an informative logical appeal. The appeal to empathy was seen in the statement "People of all ages can be injured or killed in accidents on MT farms, but probably the most painful statistics are those that deal with children" (para. 1); While the informative logical appeal was seen in the following statement. "The National Safety Council reports that each year 300 children die, and at least 23,000 children suffer nonfatal injuries in farm accidents" (para. 1).

Throughout all of the webpages, a total of 116 emotional appeals were used. The threat appeal was used the most ($n = 26$, 17.2%), while the humor appeal was only used three (2.0%) times. The total logical appeals ($n = 286$) used in the webpages more than doubled the total ($n = 116$) of emotional appeals used. The informative appeal was used most often with 146 (96.7%) of the webpages using this appeal. The gain appeal was also used in 82 (54.3%) of the webpages.

A summary of the occurrence of emotional and logical appeals can be seen in Table 3.

Table 3

Messaging Appeals Used in Agricultural Awareness Webpages

Emotional Appeals		
Threat	26	17.2
Empathy	20	13.2
Promise	18	11.9
Guilt	14	9.3
Fear	14	9.3
Pride	11	7.3
Emotional	10	6.6
Humor	3	2.0
Logical Appeals		
Informative	146	96.7
Gain	82	54.3
Loss	28	18.5
Social Modeling	16	10.6
Rhetorical Question	9	6.0
Self Reference	3	2.0
Irony	2	1.3

Note. Values add up to more than 100% as each webpage was coded for multiple appeals.

In addition to the message appeals, the webpages were also analyzed for pre-determined frames. The agricultural education frame (i.e., evidence of activities and actions that are being done to promote education on topics of agriculture) appeared the most (n = 104, 68.9%), followed by the economic (i.e., monetary value or jobs associated with agriculture production; n = 77, 51.0%) and environmental frames (i.e., positive or negative impacts of agriculture on the environment; n = 65, 43.0%). The opportunity for all (i.e., idea that everyone deserves an equal chance at the benefits life has to offer; n = 18, 11.9%), animal welfare (i.e., discusses or promotes issues surrounding animal welfare; n = 16, 10.6%), and food safety frames (i.e., discusses issues related to food safety; n = 13, 8.6%) were used the least. Table 4 details the frames used in the sample of webpages examined in this study.

Table 4

Frames Used in Agricultural Awareness Webpages

Frames	*f*	%
Agricultural Education	104	68.9
Economic	77	51.0
Environmental	65	43.0
Local Food	44	29.1
Moral Norms	42	27.8
Prevention	37	24.5
Opportunity for All	18	11.9
Animal Welfare	16	10.6
Food Safety	13	8.6

Note. Values add up to more than 100% as each webpage was coded for multiple frames.

CONCLUSIONS

While the public is increasingly disconnected from the agricultural industry (Powell & Agnew, 2011), agricultural communicators are increasingly focusing efforts on the communicating with the public (Telg & Irani, 2012), including online (Goodwin et al., 2011). The purpose of this study was to explore the content of agricultural awareness information presented on webpages. The findings for the manifest content indicated that many of the webpages in the sample were second-tier webpages and contained a URL extension of .org or .com. The media content appearing most frequently on the webpages was logos, followed by Facebook plugins. However, the Facebook plugins appeared on fewer than half of the webpages. Assessment of the latent content revealed that the images on the webpages often included non-farming adults, positive food products, and fields. The message content of the webpages included more logical appeals than emotional appeals, and the most frequently used frames were agricultural education and economic.

Of the 151 webpages analyzed, 98 were housed on second-tier webpages. Depending on the search terms used by a public audience to find agricultural information, second-tier webpages may be less accessible than homepages (Boyne & Hall, 2004). Additionally, understanding where agricultural awareness webpages occur in search engine results is important as Internet users often turn to search engines when looking for information (Purcell et al., 2012) and they are not likely to look past the first two pages of search results (Höchstötter & Lewandowski, 2009). The accessibility of online agricultural awareness information could be improved given the occurrence of several state searches resulting in less than five webpages as well as one state yielding no usable results. Social media plugins among the agricultural awareness webpages were limited. A lack of social media plugins may also be limiting the reach and spread of agricultural awareness information (Elder et al., 2004; Palmgreen & Donohew, 2006).

Although many of the webpages included images, it is unknown whether these were seen as favorable and attractive to the target audience. The most effective images create a personal connection with the audience (Jacobs & Shapiro, 1994; Sniderman et al., 1990). The presence of non-farming adults was likely attractive to a consumer audience. A non-farming individual may see himself or herself in an image of a non-farming adult, providing contextual or personal meaning (Moriarty, 2005; Rose, 2007). The presence of a farmer in an image may provide a stereotypical, historical, or cultural meaning, but it is less likely that a non-farming adult will form a strong connection to an image that they view as different from them (Moriarty, 2005; Rose, 2007). Images or messages that form strong personal connections are more likely to be remembered and used in future decision-making (Nabi & Oliver, 2010). The presence of images of positive food products

and fields among the webpages likely provided contextual, cultural, or direct meaning to the viewers (Moriarty, 2005; Rose, 2007). Additionally, the webpages that did include images were more likely to appeal to individuals with a low interest in agriculture (Abrams & Meyers, 2012).

Framing and message appeals are particularly important because of impacts on how individuals process information, affecting public perceptions (Atkin & Salmon, 2010; Scheufele & Tewksbury, 2007). The results for latent content showed that the number of logical appeals outweighed the emotional appeals. This could impact the effectiveness of the webpages as emotional appeals have been shown to connect with and be remembered by the audience more so than logical appeals (Srivastava & Sharma, 2008; Zinn & Manfredo, 2000). Because logical appeals tend to be based on reason and facts (O'Guinn et al., 2003; Zinn & Manfredo, 2000), the prevalence of logical appeals in agricultural awareness messages may hinder the webpages' effectiveness, as individuals rely on more than logic for decision-making (Durkin et al., 2009) and runs counter to recommendations from previous agricultural communications research (Goodwin & Rhoades, 2011).

Several frames were used throughout the webpages; however, the agriculture education and economic frames were used most often. Although these are important topics, the frequent occurrence of these frames may be decreasing the overall effectiveness of the information presented on the webpages. Previous research has shown that education-only and fact-based content has traditionally been less effective (Durkin et al., 2009). To increase effectiveness, educational and fact-based frames should be mixed with other types of frames and appeals. Despite the presence of images that likely would appeal to many, the education and information-oriented frames and appeals used suggested that the webpages examined in this study are better suited for high-involvement audiences, or those involved or interested in agriculture, rather than low-involvement audiences (Abrams & Meyers, 2012). Therefore, it is unlikely that the webpages assessed in this study will be successful in reaching the majority of the U.S. public, which is not actively involved in the agricultural industry (United States Census Bureau, 2015; USDA, 2015).

RECOMMENDATIONS

Based on the findings, it is concluded that the agricultural industry has room to improve the overall effectiveness of their agricultural awareness webpages. Agricultural communicators should create agricultural awareness webpages based on theory and academic research (Elder et al., 2004; Randolph & Viswanath, 2004). Any agricultural awareness webpages should be pre-tested through qualitative methodologies or usability techniques prior to being launched to the public (Elder et al., 2004), which should improve webpage effectiveness. Webpage planning should also include an assessment of competing information and an understanding of the psychographics and demographics the target audience as well as the information wanted by the target audience (Randolph & Viswanath, 2004). Assessing these things will allow agricultural communicators to identify what public issues might need to be addressed and ensure the quality and effectiveness of the webpage is greater than that of the competition.

Current and future agricultural awareness webpages should work toward moving away from education- and fact-based, information-heavy messages (Durkin et al., 2009). Additionally, the incorporation of more emotional appeals should be pursued (Srivastava & Shara, 2008; Zinn & Manfredo, 2000). It is also recommended that agricultural communicators look carefully at the channels and frequency through which the target audience will be receiving the agricultural awareness messages (Atkin & Salmon, 2010). For all webpages, whether current or future, it is recommended that a formative evaluation be conducted to ensure that desired effectiveness is being achieved and any needed adjustments are made (Randolph & Viswanath, 2004).

This study is limited by the search terms, the webpages included in the sample, and the variables included in the instrument. Additionally, the study assumed that the webpages in the sample were created for a consumer target audience. An effort should be made to identify the intended target audience for the webpages examined in future research. It is also recommended that future studies reassess the effectiveness of agricultural awareness webpages and measure any improvements that might be present. In addition, future research should test consumer perceptions of a sample of web-

pages to fully grasp the effectiveness and impact of the messages. The search terms used by a consumer audience to find agricultural awareness information should also be assessed. Future research should test the effectiveness of agricultural awareness webpages among those with high and low involvement or interest in the agricultural industry. Another limitation of this research is that it does not compare pro-traditional agricultural and anti-traditional agricultural sites. Future research should compare webpages from pro- and anti-traditional agricultural organizations, expanding the line of research from Abrams and Meyers (2012) and along the same lines of the recommendation from Rhoades and Ellis (2010) to assess complementing and competing information. As the need for agricultural awareness continues to increase, it is important for the agriculture industry to regularly assess the effectiveness of awareness webpages in order to ensure that our communication is impacting the decision making of the public on agricultural topics (Frick et al., 1995; Meischen & Trexler, 2003).

REFERENCES

Abrams, K. & Meyers, C. (2012). From opposite corners: Comparing persuasive message factors and frames in opposing organizations' websites. *Journal of Applied Communications, 96*(1), 54-67.

Advocates for Agriculture. (2007). *Promoting ag one story at a time,* Retrieved from http://advocatesforag.com/index.php?option=com_frontpage&Itemid=1

American Farm Bureau. (2003, January). PAL leadership program develops "*Advocates for agriculture,*" Retrieved from http://www.fb.org/index.php?fuseaction=newsroom.newsfocus&year=2003&file=nr0118.html

Anderson, M., & Perrin, A. (2015). *15% of Americans don't use the internet. Who are they?* Retrieved from http://www.pewresearch.org/fact-tank/2015/07/28/15-of-americans-dont-use-the-internet-who-are-they/

Ary. D, Jacobs L.C., & Sorensen C. (2010). *Introduction to research in education* (8th ed.). Belmont, CA: Wadsworth, Cengage Learning.

Atkin, C. & Salmon, C.T. (2010). Communication campaigns. In C.R. Berger, M.E. Roloff, & D.R. Roskos-Ewoldsen (Eds.), *The handbook of communication science* (2nd ed.) (pp. 419-436). Thousand Oaks, CA: Sage Publications, Inc.

Babbie, E. (2010). *The practice of social research* (12th ed.). Belmont, CA: Wadsworth.

Berelson, B.R. (1952). *Content analysis in communication research.* New York, NY: Free Press.

Boyne, S., & Hall, D. (2004). Place promotion through food and tourism: Rural branding and the role of websites. *Place Branding 1*(1), 80-92. doi: http://dx.doi.org/10.1057/palgrave.pb.5990007

Durkin, S.J., Beiner, L., & Wakefield, M.A. (2009). Effects of different types of antismoking ads on reducing disparities in smoking cessation among socioeconomic subgroups. *American Journal of Public Health, 99*(12), 2217-2223. Retrieved from http://ajph.aphapublications.org/

Eastin, M.S. (2001). Credibility assessments of online health information: The effects of source expertise and knowledge of content. *Journal of Computer Mediated Communication, 6*(4). doi:10.1111/j.1083-6101.2001.tb00126.x

Elder, R.W., Shults, R.A., Sleet, D.A., Nichols, J.L., Thompson, R.S., & Rajab, W. (2004). Effectiveness of mass media campaigns for reducing drinking and driving and alcohol-involved crashes: A systematic review. *American Journal of Preventive Medicine, 27*(1), 57-65. doi:10.1016/j.amepre.2004.03.002

Frick, M.J., Birkenholz, R.J., & Machtmes, K. (1995). Rural and urban adult knowledge and perceptions of agriculture. *Journal of Agricultural Education, 36*(2), 44-53. doi:10.5032/jae.1995.02044

Goodman, D., & DuPuis, E.M. (2002). Knowing food and growing food: Beyond the production-consumption debate in the sociology of agriculture. *Sociologia Ruralis, 42*(1), 5-22. doi:10.1111/1467-9523.00199

Goodwin, J.N., Chiarelli, C., & Irani, T. (2011). Is perception reality? Improving agricultural messages by discovering how consumers perceive messages. *Journal of Applied Communications, 95*(3), 21-33. Retrieved from http://journalofappliedcommunications.org

Goodwin, J., & Rhoades, E. (2011). Agricultural legislation: The presence of California Proposition 2 on YouTube. *Journal of Applied Communications, 95*(1), 22-35. Retrieved from http://journalofappliedcommunications.org/

Haskins, J.B. (1985). The role of mass media in alcohol and highway safety campaigns. *Journal of Studies on Alcohol, 10*, 184-191. Retrieved from http://ukpmc.ac.uk/abstract/MED/3862856

Höchstötter, N., & Lewandowski, D. (2009). What users see – Structures in search engine results pages. *Information Sciences, 179*(12), 1796-1812. doi:10.1016/j.ins.2009.01.028

Holsti, O.R. (1969). *Content analysis for the social sciences and humanities.* Reading, MA: Addison-Wesley.

Jacobs, L.R., & Shapiro, R.Y. (1994). Issues, candidate image, and priming: The use of private polls in Kennedy's 1960 presidential campaign. *The American Political Science Review, 88*(3), 527-540. Retrieved from http://www.apsanet.org

Kantar Media Compete. (2015). *Seeing between the lines…of the search and the click.* Retrieved from http://www.compete.com

Lombard, M., Snyder-Duch, J., & Bracken, C.C. (2002). Content analysis in mass communication assessment and reporting intercoder reliability. *Human Communication research, 28*(4), 587-604. doi:10.1111/j.1468-2958.2002.tb00826.x

Lundy, L.K. (2004). *Globally speaking: The effect of internal message frames on attitudes and cognitive processing focused on internationalizing extension within the elaboration likelihood model* (Doctoral dissertation). Retrieved from http://etd.fcla.edu/UF/UFE0005423

Meischen, D.L., & Trexler, C.J. (2003). Rural elementary students' understandings of science and agricultural education benchmarks related to meat and livestock. *Journal of Agricultural Education, 44*(1), 43-55. doi:10.5032/jae.2003.01043

Montana Farm Bureau. (n.d.). *ABCs of Farm Safety.* Retrieved from http://mfbf.org/programs/abcs-of-farm-safety/

Moriarty, S. (2005). Visual semiotics theory. In K. Smith, S. Moriarty, G. Barbatsis, & K. Kenney (Eds.), *Handbook of visual communication theory, methods, and media* (pp. 227-242). Mahwah, NJ: Erlbaum.

Nabi, R., & Oliver, M.B. (2010). Media effects. In C.R. Berger, M.E. Roloff, & D. Roskos-Ewoldsen, *Handbook of communication science* (2nd ed.). Sage.

Netmarketshare. (2012). *Market share for mobile and desktop.* Retrieved from http://marketshare.hitslink.com

O'Guinn, T.C., Allen, C.T., & Semenik, R.J. (2003). *Advertising and integrated brand promotion* (3rd ed.). Mason, OH: Thomson South-Western.

Ohio Farm Bureau. (2009, July). Social media in agriculture. *Speak Out*, Retrieved from http://ofbf.org/media-and-publications/

Palmgreen, P., & Donohew, L. (2006). Effective mass media strategies for drug abuse prevention campaigns. *Handbook of sociology and social research*, 2, 27-43. doi: 10.1007/0-387-35408-5_2

Potter, W.J., & Levine -Donnerstein, D. (1999). Rethinking validity and reliability in content analysis. *Journal of Applied Communication Research, 27*, 258-284. doi: 10.1080/00909889909365539

Powell, D.V., & Agnew, D.M. (2011). Assessing agricultural literacy elements of project food land and people in K-5 using the food and fiber systems literacy standards. *Journal of Agricultural Education, 52*(1), 155-170. doi:10.5032/jae.2011.01155

Purcell, K., Brenner, J., & Rainie, L. (2012). *Search engine use in 2012.* Retrieved from http://www.pewinternet.org/files/old-media//Files/Reports/2012/PIP_Search_Engine_Use_2012.pdf

Radke, A. (2009, January). Everyday opportunities. *BEEF*, Retrieved from http://blog.beefmagazine.com/beef_daily/2009/01/22/everyday-opportunities/

Randolph, W., & Viswanath, K. (2004). Lessons learned from public health mass media campaigns: Marketing health in a crowded media world. *Annual Review of Public Health, 25*, 419-437. doi:10.1146/annurev.publhealth.25.101802.123046

Rhoades, E., & Ellis, J.D. (2010). Food tube: Coverage of food safety issues through video. *Journal of Food Safety, 30*(1), 162-176. doi: 10.1111/j.1745-4565.2009.00198.x

Riffe, D., Lacy, S., & Fico, F. G. (2005). *Analyzing media messages using quantitative content analysis in research* (2nd ed.). Mahwah, NJ: Routledge

Rose, G. (2007). *Visual methodologies.* Thousand Oaks, CA: Sage Publications.

Scheufele, D.A., & Tewksbury, D. (2007). Framing, agenda setting, and priming: The evolution of three media effects models. *Journal of Communication, 57*(1), 9-20. doi:10.1111/j.1460-2466.2006.00326.x

Sniderman, P.M., Glaser, J.M., & Griffin, R. (1990). Information and electoral choice. In J. A. Ferejohn & Kuklinski, J. H. (Eds.), *Information and democratic processes* (pp. 117-135) Urbana, IL: University of Illinois Press.

Srivastava, M., & Sharma, M. (2008). The role of emotional appeals in Internet advertising: A study of the contributing factors involved. *ICFAI Journal of Management Research, 7*(9), 27-36. Retrieved from http://web.ebscohost.com.lp.hscl.ufl.edu/

Telg, R., & Irani, T.A. (2012). *Agricultural communications in action: A hands on approach.* Clifton Park, NY: Delmar, Cengage Learning.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*(4157), 1124-1131. doi: 10.1126/science.185.4157.1124

United States Census Bureau. (2015). *U.S. and world population clock.* Retrieved from http://www.census.gov/popclock/

United States Department of Agriculture. (2015). 2012 *Census Highlights.* Retrieved from http://www.agcensus.usda.gov/Publications/2012/Online_Resources/Highlights/Farm_Demographics/#how_many

Weatherell, C., Tregear, A., & Allinson, J. (2003). In search of the concerned consumer: UK public perceptions of food, farming and buying local. *Journal of Rural Studies, 19*(2), 233-244. doi:10.1016/S0743-0167(02)00083-9

Zinn, H.C., & Manfredo, M.J. (2000). An experimental test of rational and emotional appeals about a recreation issue. *Leisure Sciences, 22*(3), 183-194. doi:10.1080/01490409950121852

ABOUT THE AUTHORS

Dr. Joy Rumble is an Assistant Professor of Agricultural Communication in the Department of Agricultural Education and Communication at the University of Florida. Joy works in the UF/IFAS Center for Public Issues Education (PIE Center). She conducts research and outreach initiatives to promote effective communication in agriculture. Her research has been focused on public perceptions of local food, transparent communication, and livestock legislation.

Dr. Quisto Settle is an Assistant Professor of Agricultural Communications in the School of Human Sciences at Mississippi State University. Quisto has a teaching and extension appointment related to communication and education in agriculture and natural resources. His research focuses on organizational branding.