The Effects of Livestock Production Claims on Voting Intention and Attitudes towards Conventional Products

Research Paper Submission

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Abstract

Consumers receive information about how their food is (or is not) produced on a regular basis through the labels they see in the grocery store. Production claims like eco-friendly, cage-free, and no hormones offer information about the product they are on and may cause consumers to make assumptions about the conventionally produced products that do not carry these claims. While price is often a barrier preventing consumers from purchasing products with production claims, could these labels be affecting attitudes toward conventional products and other types of behavior, such as support of policy put forth by animal activist groups? This study used an experimental design with a convenience sample of 660 college students to examine how attitudes toward conventional products are affected by production labeling claims about animal welfare and environmental impact and whether this on-package marketing can also affect intent to support an animal welfare ballot initiative. Results showed that the presence of the production claims significantly reduced positive attitudes toward the conventional product without claims. Exposure to the production claims increased positive attitudes toward the product they were on, but did not affect voting intention on the animal welfare ballot initiative. Further research needs to be done to examine other and sustained effects of production claims, but these claims are one source of information that can affect consumers' attitudes toward conventional production systems and its products.

Keywords: production claims, animal welfare, environmental claims, food labels, attitudes, voting intention, sustainable agriculture

Introduction

Production claims, which refer to how a food product was produced before slaughter or harvest, are often used on food labels to capture the eye, and hopefully the dollar, of people interested in supporting sustainable agriculture practices. The term "sustainable agriculture" is often used to incorporate the dimensions of personal health (food safety), the environment, and animal welfare. Definitions of sustainable agriculture vary widely. A basic definition is:

> The primary goals of sustainable agriculture include: (1) providing a more profitable farm income; (2) promoting environmental stewardship, including protecting and improving soil quality, reducing dependence on non-renewable resources, such as fuel and synthetic fertilizers and pesticides, and minimizing adverse impacts on safety, wildlife, water quality and other environmental resources; (3) promoting stable, prosperous farm families and communities (Sustainable Agriculture Research & Education, n.d., ¶3).

Sustainability is also defined as "a way of raising food that is healthy for consumers and animals, does not harm the environment, is humane for workers, respects animals, provides a fair wage to the farmer, and supports and enhances rural communities" (Sustainable Table, n.d., ¶1). Even those using conventional agricultural practices could argue that they are sustainable whether they ascribe to either definition. These two definitions may lead one to conclude that sustainable agriculture is a malleable concept. Regardless, most people have strong, pleasurable associations with the idea of sustainable agriculture (Williams & Wise, 1997); therefore, agricultural products marketed on dimensions of sustainability may benefit from those associations.

The problem with the marketing of food products labeled as being "sustainable" is that it could suggest the unlabeled or conventionally produced foods are inferior and from "unsustainable" agricultural systems. Consumers often equate sustainable food with organic labeled food (Yiridoe, Bonti-Ankomah, & Martin, 2005). The United States government frames the organic label as a marketing label and rejects the idea that organic food production would

have relative advantages to the environment, health or food quality (Boström & Klintman, 2003). The organic label and production claims are not meant to differentiate the food as safer, but unintentionally, they may have. Government regulations have typically been used to distinguish between safe and unsafe foods; therefore, organic standards could give consumers the impression that conventionally produced foods are unsafe (Klonsky & Tourte, 1998). In addition, the price and intense marketing of organic and other value-added animal products likely communicates to the consumer that they are indeed better than their conventional counterparts (Klonsky & Tourte, 1998). Higher prices and levels of advertising often trigger a placebo effect in which consumers believe those products are of higher quality, and subsequently, they have better experiences with the products than those less advertised and/or with lower prices (Shiv, Carmon, & Ariely, 2005).

Literature Review

"The environmental ethic that gained worldwide prominence with Earth Day 1990 placed emphasis on individual responsibility for personal health and social action on environmental quality and animal welfare" (Yiridoe et al., 2005, p. 196). In the midst of a strong environmental movement (Dunlap & Mertig, 1992; Gottlieb, 2005), a health foods craze (Dubisch, 2004; Nestle, 2007), and a powerful animal rights movement (Rollin, 1990, 2003), meat and livestock production seem to represent a consumer commodity and issue through which people can demonstrate their values and goals for their health, the environment, and food animals.

Environmentalism

Eighty-three percent of Americans would agree that global warming is a serious problem and 81% feel it is their responsibility to reduce the impacts of global warming (Yale Center of Environmental Law and Policy's Environmental Attitudes and Behavior Project, 2007).

Environmental sentiments have been on the rise, but clearly, not all Americans hold the same levels of environmentalism.

Researchers have attempted to clarify different value orientations toward the environment. Kempton, Boster, and Hartley (1995) found "environmental values are already intertwined with core American values, such as religion and parental responsibility" (p. 13). Kempton et al. (1995) found environmentalism is built upon cultural models of how nature works and how humanity interacts with it, and is motivated by environmental values. Americans tend to idealize the environmentalism of simpler times and desire to return to that more natural way of life. Environmental values include humanity's utilitarian need for nature, obligations to future generations, the spiritual or religious value of nature, and for some, the rights of nature in and of itself (Kempton et al., 1995).

Because most Americans feel some sense of responsibility to the environment, marketers have begun environmental or green marketing (Grant, 2008). Purchasing meat with production claims regarding the environment (i.e., environmentally-friendly, good for the environment) is a relatively simple behavior for consumers to reinforce environmental values. While consumers generally have positive attitudes toward such foods, the difficulty in persuading people to purchase them is that they often are priced at a premium and consumers' are hesitant to believe their purchase will have an impact (Vermier & Verbeke, 2006). Even if marketing of environmental attributes is not causing a dramatic shift in consumer purchase behavior, it may potentially affect consumer sentiment towards other products and other types of behavior.

Animal Welfare

Animals are often seen as a part of nature or at least similar to the natural environment, especially in how people view their purpose. Like nature, animals have some intrinsic value, but generally a utilitarian value, especially when it comes to livestock. In the United States, people

desire some protection of farm animals, whether that be based on their intrinsic or utilitarian values (Garner, 1993). Animal welfare represents a balance between human and animal interests and refers to the idea that animals should not be treated cruelly or in a way detrimental to their health and well-being (Munro, 2005).

Most Americans support the notion of animal welfare (Garner, 1993). Support or activism in animal welfare and animal agriculture issues (among others) can occur at many levels, from participation in an animal protection group to private behavior such as consumption choices (Seguin, Pelletier, & Hunsley, 1998). In the sphere of individual behavior, a consumer will likely choose a product associated with improved animal welfare or production if they somehow feel responsible and/or that their choices will make a difference (Blandford, Bureau, Fulponi, & Henson, 2002; Vermeir & Verbeke, 2006).

When it comes to purchase behavior of meat products associated with improved animal welfare (i.e., organic, natural), the same price barrier often exists as it does with environmental marketing. The American Meat Institute and Food Marketing Institute (2008) conducted a survey of consumers and found if organic meat was the same price as conventional meat, the large majority (95.3%) would purchase it. Those results demonstrate that consumers are convinced of the merits of products marketed on dimensions of environmental sustainability and animal welfare.

Political Actions Affecting Meat Production

If some consumers are not already "voting with their dollar" to voice support for alternative livestock production practices, they are supporting state legislation in the voting booth on initiatives advocated by the Humane Society of the United States and other well-funded opponents of conventional practices. In Florida, Arizona, and California, voters have

overwhelmingly supported policy banning common methods of animal confinement for pregnant pigs, egg-laying hens, and/or veal calves.

The animal agriculture industry tends to blame animal agriculture opponents, such as People for the Ethical Treatment of Animals (PETA) and the Humane Society of the United States (HSUS), for misleading consumers, voters, policymakers, and the media on issues regarding animal welfare, the healthiness of meat products, and the environmental impacts of conventional practices (Crowell, 2009; Downing, 2009; Gabbett, 2008; Smith, 2009). The HSUS Factory Farms campaign website has 31 secondary research reports on the industry's detriments to animal welfare, eight on environmental impacts, and 13 on human health that it widely distributes to policymakers and corporations (HSUS, 2008; E. Williams, personal communication, December 4, 2008). These reports are not necessarily misleading but show that these organizations are attempting to implicate animal agriculture in detrimentally affecting human health, the environment, and animal welfare. As with any controversial topic, each side in the debate carefully selects sources and evidence that supports their perspective on the issue. The HSUS is known for campaigning heavily for animal agriculture industry reform, using emotional appeals and more persuasive message strategies than the industry groups like Farm Bureau and the Animal Agriculture Alliance (Abrams & Meyers, 2009; Goodwin & Rhoades, 2009).

Answering whether the public's support of policy initiatives on livestock care is evidence of the animal agriculture opponent groups' successful campaigning or Americans' evolving value-systems regarding livestock production would be like answering the chicken or the egg conundrum. It is likely that animal agriculture opponents are more successful as a direct result of changing values and less familiarity with farming, especially livestock production.

Within the industry, segments and individuals regard organic agriculture as another foe of the conventional industry (Obach, 2007) because organic products are often touted as better in many dimensions, including taste, nutritional value, and sustainability (Organic Trade Association, 2008). However, whether organic food actually delivers on these desires and beliefs is controversial and the subject of a scientifically inconclusive debate (Obach, 2007). A review of 162 studies conducted over 50 years found that organic food had no nutritional or health benefits over conventional food (Dangour et al., 2009). A USDA publication reviewing several studies comparing organic to non-organic agriculture production did find that, generally (with a few exceptions), organic agriculture has several environmental advantages (Gold, 2010).

Despite the scientific debate, consumers have come to believe in the superiority of organic and more naturally produced foods. The Harris Poll found that more than three-quarters of the U.S. public believes organic food is safer for the environment (79%) and healthier (76%) than conventional foods ("Harris poll results," 2007).

While some in the agriculture industry may still see organic agriculture as a detriment to the conventional industry, today, many producers and companies have embraced this niche market. This resulted in diversified production practices and purchases of organic farms and brands to capture a piece of the premiums consumers are willing to pay for these products and the positive corporate reputation that comes from being attached to an initiative that is supposedly better for animal welfare, the environment, and human health (Guthman, 2004).

Although the industry often points to animal agriculture opponent groups for the shift in people's thinking about what is acceptable in livestock production practices in the United States, marketing organic and more naturally produced products as better than unlabeled ones may have

unintended consequences. The messages consumers receive in the grocery store week after week are likely far more memorable and pervasive than what the HSUS puts in a video on YouTube or in an ad before a vote on a ballot initiative. Consumers receive multiple exposures, which are more salient than a single or few exposures to TV or Web ads/videos, to messages about meat production through package labeling claims in the grocery store. A 2009 Nielsen poll found 61% of consumers read food labels. Jauregi and Ward (2006) surveyed a little over 14,500 households and found 60% base their food purchase on using the labels.

Purpose and Hypotheses

With less than 1% of the U.S. population involved in production agriculture (Hurt, 2002), most consumers may only learn of certain production inputs from reading food labels. The question becomes, are production claims on meat labels affecting what people believe about the unlabeled product? Limited research has been done to examine the effects of production labeling claims on consumers' attitudes toward those that do not carry such claims and on voting intentions on an animal welfare policy. Empirical research is needed to determine the effects of production claims on consumer beliefs about the conventional meat product in the United States. Such research may shed light on political actions that affect livestock production, revealing why many consumers are unwilling to pay for product attributes they perceive to be better, but are willing to support policy that would make such attributes required of all animal products.

The purpose of this study was to determine the effects production labeling claims have on attitudes toward conventional food products and intention to vote on an animal welfare ballot initiative. The literature has suggested the intense marketing of sustainable agriculture products or food products could communicate that the unlabeled or conventionally produced foods are inferior and from unsustainable agricultural systems (Klonsky & Tourte, 1998). Therefore, in

examining the attitudinal and voting intention effects of exposure to production claims, the following hypotheses are proposed:

H1: Subjects exposed to a food product ***with*** production claims ***as well as*** a product ***without*** such claims will have less positive attitudes toward the product without the claims than those who only see a food product without production claims.

H2: Subjects exposed to a food product ***with*** production claims will be more likely to have intentions to vote "yes" for an animal welfare ballot initiative than those who do not see a food product with production claims.

Methodology

A posttest only randomized experimental design was used to determine the effects of production claims on attitudes toward the products and voting intention. The experiment was administered entirely online using Qualtrics, a Web-based survey tool, with a convenience sample of college students. The sample included undergraduate students from four general education courses at a large public university (N= 740). The courses contained students from a variety of colleges and majors and at varying phases in their program (freshman, sophomore, juniors, and seniors). Making generalizations about consumer behavior from college students should be done with due consideration of the sample characteristics (Peterson, 2001). However, when examining a theoretically interesting causal relationship (strictly theory testing), the focus may need to be more on internal validity than external, and, therefore, using a college student convenience sample can be ideal (Kam, Wilking, & Zechmeister, 2007). With respect to this study, it is unlikely this group will have much previous exposure to or knowledge about these kinds of labels; therefore, this sample may be appropriate to make a theoretical contribution.

To determine the production claims to be used in this study, observations of existing production labeling claims on meat and poultry were collected from six different grocery stores, which resulted in 33 unique claims. The claims were pretested with 66 undergraduate college

students through adapted nominal group assessments and online surveys to guide the selection of the claims. The environmental claims chosen and used in the study were: “Good for the environment” and “No negative environmental impacts.” The animal welfare claims were: “Free to roam” and “No cages.” The reason two similar claims were chosen for each type of claim was to test for relevant salience.

The claims were printed on a label, placed on a package of boneless, skinless chicken breasts, and photographed in a studio. Chicken was chosen to ensure reliability of the study because it is a uniform product with little to no visually detectable differences of product characteristics (Becker, Benner, & Glitsch, 2000). The same package of chicken was used for the conventional and production claims products and across both treatment conditions to control for any quality differences. Price, cut, weight, and brand were also held consistent between the products and conditions. In the control condition, two products were still used, except one of the labels contained general product claims that stated: “Boneless and skinless” and “Chicken breasts” rather than production claims. This was done to control for effects as a result of providing more text on the label. A t-test showed no significant attitudinal differences between the product with general product claims and the conventional product without any claims.

Procedure

Subjects (N= 740) were randomly assigned with the use of a random number generator to the production claims present condition or the production claims absent (control) condition to test the hypotheses. In the production claims present condition, subjects simultaneously viewed two images side-by-side: (1) a package of chicken with a production claim about animal welfare and one about environmental impact, cut, weight, and price on the label, and (2) a package of chicken with only cut, weight, and price on the label (referred to hereafter as the product without claims). In the control condition, subjects simultaneously viewed (1) a product with general

product claims (boneless and skinless, and chicken breasts), and (2) the image of the product without the claims.

After viewing the product with claims and product without claims simultaneously, subjects' attitudes toward each product were measured to test H1 and H2. Batra and Ahtola (1991) state that "consumer attitudes have distinct hedonic and utilitarian components" (p. 168). The hedonic component refers to affective/emotional gratification from consumption behavior. The utilitarian component refers to the instrumental, practical reasons. Attitudes in this study were measured using the scale developed by Batra and Ahtola (1991) that measures these components of consumer attitudes using 12 semantic differential questions. Four additional researcher-developed items were added to assess product-specific attitudes. The scale reliabilities exceeded a Chonbach's alpha of .95. Attitudes were measured to capture more variability in the treatment effects and because they have a reasonable amount of stability (Kahneman & Sugden, 2005).

After completing the attitudinal measures, subjects' voting intention was assessed to test H2. To measure voting intention, a hypothetical ballot using the same language from California's 2008 Proposition 2 was presented with the following proposition:

> **On the next ballot in your state, the following initiative regarding the confinement of livestock is being proposed:**
>
> Calves raised for veal, egg-laying hens, and pregnant pigs can be confined only in ways that allow these animals to lie down, stand up, fully extend their limbs, and turn around freely. Under the measure, any person who violates this law would be guilty of a misdemeanor, punishable by a fine of up to $1,000 and/or imprisonment in county jail for up to six months.
>
> **How do you plan to vote?**
> □ Yes
> □ No

The instrument was examined by a panel of experts in marketing and consumer psychology research for face and content validity and pilot tested with 30 undergraduate students. Subjects were told the study was a survey on food opinions to control for suspicion/hypothesis guessing and compensatory rivalry but then debriefed at the end of the study. Manipulation checks were also included at the end to control for construct validity threats.

Results

Sample Characteristics

Of the 740 students recruited to participate in the online experiment, 89.2% (n= 660) participated. Descriptive analysis indicated 459 of subjects were female (69.5%) and 201 were male (30.5%). The undergraduate student population from which the sample was chosen contains more females (55%) than males (45%) ("University" Office of Institutional Planning and Research, 2009). The age range of the respondents was 18 to 33 years old, with a mean of 21 years old (SD= 1.69). With respect to political party affiliation, 265 identified themselves as Democrat (40.2%), 228 Republican (34.5%), and 78 Independent (11.8%). The majority of subjects described the community in which they grew up in as a subdivision in a city or town (n= 491, 74.4%), followed by rural, not a farm (n= 98, 14.8%), downtown in a city or town (n= 47, 7.1%), and farm (n= 23, 3.5%). The majority of subjects (n= 601, 91.1%) do the grocery shopping for themselves or their household and 41 (6.2%) help make the decisions as to what food to purchase.

Subjects who grocery shop or help make the food purchasing decisions, were asked whether they pay attention to five different types of production labeling claims: 1) organic labels, 2) labels that address the way the animal was raised, 3) labels that say "no hormones," 4) labels that say "no antibiotics," and 5) labels that suggest the product is better for the environment

("green"). The sample was fairly evenly split (with the exception of claims addressing the way the animal was raised) between "yes" and "no," with slightly more indicating "no" on all five of the labeling claim types. Table 1 displays the results in entirety.

Table 1
Attention to Selected Production Labeling Claims on Meat or Poultry

	Yes	
Type of Labeling Claim	*n*	%
No hormones	319	49.6
Organic	306	47.6
No antibiotics	285	44.4
Better for environment	283	44.1
Way animal was raised	226	35.1

When asked how often they purchase meat or poultry products with these five production labeling claims, most indicated they purchase them never or less than once a month. The means were all less than 2, with the way the animal was raised having the lowest purchase frequency (*M*= 1.13, *SD*= 1.44) and no hormones having the highest purchase frequency (*M*= 1.55, *SD*= 1.71). See Table 2 for the complete results.

Table 2
Purchase Frequency of Meat/Poultry With Selected Production Labeling Claims

Type of Labeling Claim	*n*	*M*	*SD*
No hormones	642	1.55	1.71
No antibiotics	638	1.42	1.66
Organic	640	1.21	1.45
Better for environment	642	1.21	1.42
Way animal was raised	641	1.13	1.44

Note. Scores based on Likert scale with 0= never, 1= less than once a month, 2= once a month, 3= twice a month, 4= weekly, 5= every time.

The attitude score ranged from 1 (most negative) to 3 (neutral) to 5 (most positive). The grand mean on attitude toward the products without the claims was 3.53 (*SD*= .84). The grand mean attitude toward the products with the claims was higher (*M*= 4.04, *SD*= .74). Overall, attitude toward the product with the claims was more positive than attitude toward the product without the claims. Table 3 displays the results for each item.

Table 3
Grand Means Attitude Toward Product (Product Specific + General Attitude)*

	Product Without Claims		Product With Claims	
	M	*SD*	*M*	*SD*
Unsafe to eat when cooked: Safe to eat when cooked*	4.25	0.97	4.46	0.85
Useless : Useful	3.98	0.98	4.18	0.87
Worthless : Valuable	3.86	0.97	4.14	0.85
Unhealthy : Healthy*	3.70	1.09	4.27	0.84
Harmful : Beneficial	3.62	1.08	4.17	0.85
Dislike : Like	3.57	1.13	4.05	0.93
Disagreeable : Agreeable	3.54	0.99	3.90	0.93
Bad : Good	3.53	1.08	4.01	0.92
Unpleasant : Pleasant	3.49	1.04	3.93	0.93
Awful : Nice	3.49	0.96	3.91	0.91
Unfavorable : Favorable	3.42	1.15	4.08	0.95
Foolish : Wise	3.42	0.94	3.82	0.96
Negative : Positive	3.41	1.05	4.04	0.91
Sad : Happy	3.23	0.99	3.71	0.92
Bad for the environment : Good for the environment*	3.08	1.04	3.96	1.02
From an animal treated inhumanely : From an animal treated humanely*	2.92	1.15	3.95	1.10

Note. n= 660. Scores based on semantic differential scale from 1= useless to 5= useful.
*Researcher-developed item to measure product-specific attitude.

Hypothesis 1

An independent samples t-test was conducted to compare the effects of exposure to production claims on attitudes toward the product without the claims. In the control condition, subjects were exposed to general product claims ("Boneless and skinless," "Chicken breasts") to control for attitudinal effects as a result of seeing more text on the label. The independent variable was the presence of the production claims (present, absent), and the dependent variable was attitude toward the product without claims.

This hypothesis was supported. The independent samples t-test showed a significant difference between the two groups $t(658) = -.3.31$, $p = .001$ (2-tailed). An inspection of the mean scores indicated that subjects' exposed to the production labeling claims had less positive attitudes toward the product without claims than those who only saw the product without claims (see Table 4).

Table 4
Independent Samples T-Test for Differences in Attitude Toward Product Without Claims Between Treatment Groups

	n	*M*	*SD*	*t*	*df*	*p*
Production Claims Absent	216	3.68	0.81	-3.31	658	.001
Production Claims Present	444	3.46	0.84			

Note. Scores ranged from 1 (most negative) to 3 (neutral) to 5 (most positive).

Hypothesis 2

A Chi-square test for independence indicated no significant association between subjects' exposure to production labeling claims and their voting decision on the animal welfare ballot initiative. The majority of subjects indicated they plan to vote yes for the law (n = 510, 77.3%); therefore, the hypothesis was not supported.

Conclusions and Implications

When examining the attitudinal effects of production labeling claims, subjects' exposed to those claims had less positive attitudes toward the product without the claims than those exposed to general product claims. The product without the claims was meant to represent the conventional commodity product to determine how production labeling claims affect people's attitudes toward the conventional product. The results did not show that exposure to production claims produces negative attitudes toward conventional products, but it did produce markedly less positive attitudes. The results show that consumers view the conventional product inferior to the product with production claims on the aspects of safety, healthiness, humane animal treatment, and environmental-friendliness, as well as on more general aspects. Thus, the production claims are a source of information reducing consumers' positive attitudes toward those aspects of conventional agriculture production and its food products. Previous work suggested this may be the case (Klonsky & Tourte, 1998), but this study provides additional empirical support in a controlled experimental setting. The claims could serve as a prompt, causing consumers to recall negative information from the news media and mass media (Craven & Johnson, 1999). It is unclear how much of consumers' beliefs and subsequent attitudes toward food products can be accounted for by various communication channels (i.e., advertisements, labels, news media, websites, social media, etc.). For example, would the majority of consumers know (or be concerned about) antibiotic and hormone use or confinement in livestock production if they weren't inundated with more expensive products claiming to be absent of those inputs? This study shows that the production claims are a source of information that produces inferior attitudes toward conventional products without such claims, whether that attitude translate into behavioral intent was another question this study attempted to answer.

The exposure to production labeling claims and subsequent attitudes, however, did not translate into voting intention on an animal welfare ballot initiative. Subjects overwhelmingly indicated they intended to support this policy. The reason no treatment effects were seen could be due to several reasons. One reason could stem from the fact that political decision making information that affects decisions typically comes in other forms of communication (i.e., TV ads, websites, news and editorials, etc.). This study intended to determine if food labels could be a source of communication affecting political decision making but did not find that to be the case. Another reason could be that the measure was a one-item, dichotomous measure of behavioral intent to closely represent reality. Multiple item measurement with a wider scale would better capture the variance that naturally exists in complex decision making.

Interestingly, the subjects indicated they pay the least amount of attention to animal welfare claims and purchase food with such claims the least in comparison to four other types of production claims (no hormones, no antibiotics, organic, and environmentally friendly). This food shopping characteristic is similar to studies surveying general adult consumer populations (Verbeke & Viaene, 1999; Yiridoe et al., 2005; Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007). The data shows, on the other hand, that they are willing to support legislation that would make it required of all livestock producers to provide their livestock more space in confinement, which is an animal welfare consideration. While subjects were willing to support a government policy, they were not willing to "put their money where their mouth is."

Recommendations

Future Research

A follow-up study should include other dependent measures that may be affected by food labeling claims. Behavior, such as willingness to pay and purchase likelihood, would offer

additional insight into the effects of food labels. In addition, while attitudes can be a useful measure of food label communication effects, it would be worthwhile to examine other effects such as risk perceptions. In people's subjective evaluation of risk, nine general properties of activities or technologies emerge: (1) voluntariness of risk, (2) immediacy of effect, (3) knowledge about the risk by the person who are exposed to the potentially-hazardous risk source, (4) knowledge about the risk in science, (5) control over the risk, (6) newness, i.e. are the risks new and novel or old and familiar ones, (7) chronic/ catastrophic, (8) common/dread, i.e. whether people have learned to live with and can think about the risk reasonably and calmly, or is it a risk that people have great dread for, and (9) severity of consequences (Fischoff, Slovic, Lichtenstein, Read, & Combs, 2000). Using those dimensions of risk, a measure of livestock production risk perceptions could be measured. As previously mentioned, a more complex measure of voting intention would also be useful in capturing greater variability in the potential effects of food labeling as communication affecting political decisions. Finally, further research is needed to determine the sustainability of the attitude change caused by viewing production claims.

Practitioners

In this study, exposure to production labeling claims about animal welfare and environmental impact reduced positive attitudes toward the product without such claims. Specifically, the conventional product was viewed as inferior to the product with production claims on the aspects of safety, healthiness, humane animal treatment, and environmental-friendliness, as well as on more general aspects. While this is likely viewed as a positive finding for those with a vested interest in alternative agriculture production and products, it is probably concerning to those who believe in the merits of conventional agriculture.

Government food regulators must consider the effects of food labeling to ensure the policies, standards, and guidelines for such labels are balancing the market for agricultural products and not misleading consumers (Golan, Kuchler, & Mitchell, 2001). If organic and other "sustainably" labeled foods continue to be perceived as the safer and better food choice, the conventional food production systems will be threatened by negative consumer sentiment in addition to political and societal pressure to change. Government regulators must meticulously consider these types labeling claims before approving them and be responsible for communicating their meaning to consumers.

The marketing of these sustainable (or alternative) agriculture products contributes to the devaluation of products that do not have such claims; however, many products, even those from conventional systems could qualify for many different types of production claims. It is recommended that those within the agricultural industry develop a system to explore the facets of farming operations that may qualify food products for production and/or processing claims, especially those related to health and food safety, animal welfare, and environmental impact.

The results of this study also imply that agricultural communicators working on behalf of conventional agriculture need to help rebuild attitudes toward that type of production system and help consumers understand the meanings and implications of various food labels. They also need to assist in communication efforts regarding the aforementioned topics with opinion leaders, policy makers, and voters on agricultural policy issues. Beyond that, agricultural communicators should help their organizations and businesses understand and value these attitudes because the controversy over alternative agriculture and conventional agriculture is far from over (see Paarlberg, 2010 and Lappé, 2010).

Production labeling claims are a source of information affecting consumers' attitudes towards conventional agriculture products and perhaps even the production system. Agricultural communicators should not underestimate the effects that food marketing and advertising can have on consumers' attitudes toward conventional agriculture and its products, and consider these effects in addition to messages put forth by activist groups and mass media.

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The Role of FEMA Independent Study Courses in Cooperative Extension Professional Development

Category: Professional paper

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The Role of FEMA Independent Study Courses in Cooperative Extension Professional Development

Abstract

The first standardized emergency response system, the Incident Command System, was created in response to inadequate coordination of responses to wildfires in California. The ICS was adopted by federal agencies and evolved from a firefighting framework to an all-risk system for handling multiple types of incidents. The ICS then became the basis for the National Incident Management System, which was adopted by the federal government in 2004 in response to concerns about its handling of incidents such as Hurricane Andrew in 1992 and September 11. NIMS is the first standardized structure for incident management in U.S. history, and it provides a framework for coordination among government agencies and private-sector organizations. Within NIMS, Cooperative Extension is recognized as a key stakeholder on the local and state levels, particularly in public outreach. As a result, training Cooperative Extension professionals is imperative to successful incident responses, and Texas has developed a training program to ensure its employees are prepared to assist their communities. A significant portion of the training program uses online independent study courses offered through the Emergency Management Institute, making the program cost-effective for the agency. Through this training, Texas AgriLife Extension is able to provide support for multiple aspects of the National Response Framework through nearly 500 county extension agents and more than 150 experts involved with special response teams. This training program may serve as a model for other states, particularly those vulnerable to a wide range of incidents during which Cooperative Extension personnel would be invaluable community resources.

Keywords: Cooperative Extension, emergency response, incident management, agriculture, Incident Command System, National Incident Management System

The Role of FEMA Independent Study Courses in Cooperative Extension Professional Development

Introduction

In the 1970s, a spate of forest fires in California tested the capabilities of the state's firefighting agencies (Bigley & Roberts, 2001; Buck, Trainor, & Aguirre, 2006; Lindell, Perry, & Prater, 2005). Interagency coordination proved inadequate: dissimilar organizational structures; poor emergency assessments; and uncoordinated planning, resource allocation, and communication impeded success (Lindell et al., 2005). To correct this lack of interagency coordination, California's emergency-response entities developed the FIRESCOPE Program (Harrald, 2006; Lindell et al., 2005). FIRESCOPE connected federal, state, and local firefighting agencies, and officials designed a response system that allowed all agencies to work cooperatively.

Officials dubbed their framework the Incident Command System (ICS). This emergency-response structure eventually was adopted by the U.S. Forest System, the Bureau of Land Management, and the National Park Service (Buck et al., 2006; Harrald, 2006; Irwin, 1989). The ICS approach gradually evolved from a firefighting framework to an "all-risk" system capable of handling many types of natural disasters, including hurricanes and earthquakes, and a wide scope of emergencies, such as oil spills (Bigley & Roberts, 2001, p. 1282; Harrald, 2006; Moynihan, 2009). Eventually, the ICS was used as the basis for the National Incident Management System (NIMS), which was formally adopted by the federal government in 2004 (Harrald, 2006; Jamieson, 2005).

Organizations based on the Incident Command System are highly bureaucratic, formalized, and temporary, yet they are very reliable under unstable or uncertain conditions (Bigley & Roberts, 2001). Designed to operate at multiple jurisdictional levels, the system is

highly adaptable to a number of emergency situations, both natural and man-made (Tierney, Lindell, & Perry, 2000). The ICS fulfills its primary objective—to allow for coordinated response from single or multiple agencies and jurisdictions—by establishing common organization, terminology, and procedures (Irwin, 1989).

The ICS consists of five "building blocks": command, operations, planning, logistics, and finance/administration (Bigley & Roberts, 2001, p. 1282; Harrald, 2006). The basic framework is illustrated in Figure 1. The incident commander is responsible for all activities that occur at an incident site, including planning and implementing strategic decisions and ordering and releasing resources. People in the operations section develop and carry out tactical operations to fulfill ICS goals. Planning section officials create action plans and disseminate information related to the incident and resources. Logistics personnel provide facilities and support service. Finally, finance/administration officials are responsible for accounting, procurement, and cost analysis (Bigley & Roberts, 2001).

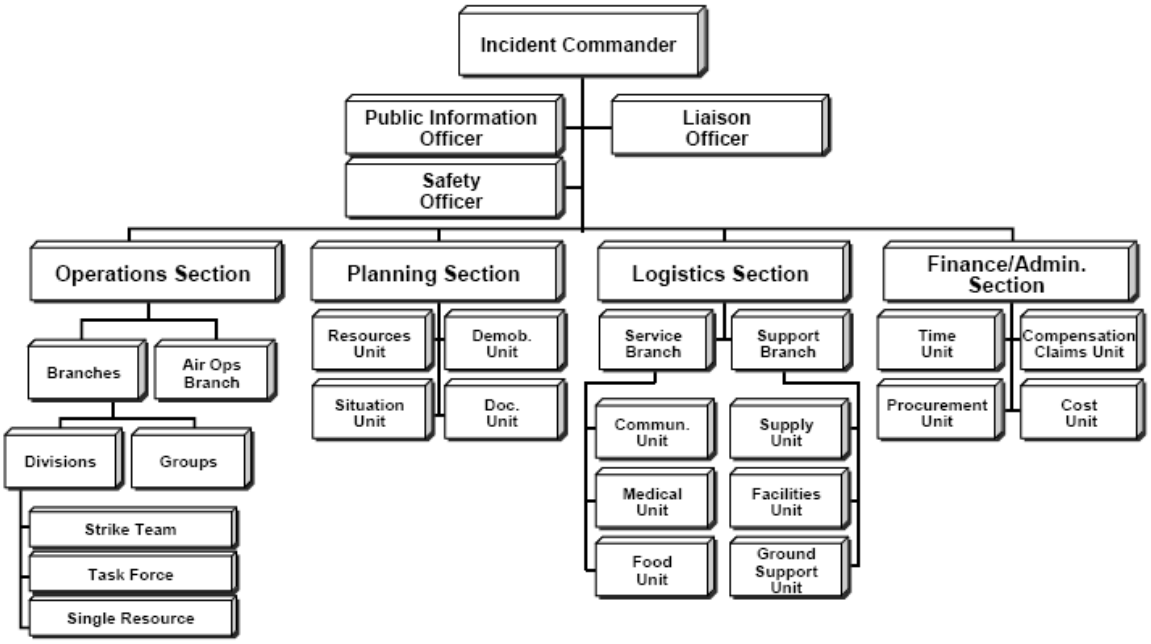

Figure 1. Structure of the Incident Command System. Adapted from *National Incident management system: Principles and practice*, by D. W. Walsh, 2005, Jones and Bartlett, Sudbury, MA.

Major concepts in ICS design include agency autonomy, management by objectives, unit integrity, and functional clarity (Irwin, 1989). The system is characterized by effective span of supervisory control; a modular organization consisting of sections, branches, divisions, groups, and units; integrated communications; comprehensive resource management; and a system of common terms and titles for personnel, resources, and facilities (Irwin, 1989).

National Incident Management System

The role of the federal government in crisis management has been scrutinized since the early 1990s, when the U.S. Federal Emergency Management Agency (FEMA) came under fire for its poor performance after Hurricane Andrew in 1992 (Sylves, 1994; Wamsley & Schroeder, 1996). The debate continued until the terrorist acts committed on Sept. 11, 2001, forced government officials to once again examine the nation's emergency-response capabilities. In March 2004, the newly established Department of Homeland Security (DHS), following the release of Homeland Security Presidential Directive—5 (HSPD-5) from President George W. Bush, issued the National Incident Management System (NIMS), a mandatory adoption of ICS aimed at standardizing emergency response (Comfort, 2007; Jamieson, 2005; Moynihan, 2009).

NIMS is the first national standardized outline of incident management in U.S. history, and compliance with system standards and regulations is vital to ensuring full preparation for crisis situations (Walsh, 2005). NIMS "focuses on guidelines, protocols, and standards for planning" in emergency situations (Kapucu, Lawther, & Pattison, 2007, p. 4; Center for Community Partnerships, 2006). The system provides a "consistent, flexible and adjustable national framework within which government and private entities at all levels can work together to manage domestic incidents, regardless of their cause, size, location or complexity" (Jamieson, 2005).

In addition to the hierarchical structure provided by ICS, NIMS is based on principles of disaster management, including prevention, preparedness, response, recovery, and mitigation (Annelli, 2006). The system's responsibilities include command, preparedness, resource management, information management, and implementation of supporting technologies (Annelli, 2006). While NIMS is not responsible for building or mobilizing public support for response actions (Chen, Sharman, Rao, & Updahyaya, 2008, p. 68), the system does employ Joint Information Centers (JICs) to "develop, coordinate, and deliver a unified message" (Lester & Krejci, 2007).

To comply with NIMS protocol under HSPD-5, government agencies and the private sector should implement ICS into their emergency-response plans and emphasize coordinated communication among different commands and in disseminating public information (Flynn, 2006; Harrald, 2006; Jamieson, 2005; Lippin, McQuiston, Bradley-Bull, Burns-Johnson, Cook, Gill, Howard, Seymour, Stephens, & Williams, 2006; Walsh, 2005). NIMS protocols and the ICS framework can be used for any events that pose "potential or actual [threats] to the public and environment," including large-scale public events, natural disasters, and domestic terrorism (Annelli, 2006, p. 224). The systems' applicability and flexibility make NIMS and ICS important—and sometimes mandatory—elements of training plans for employees of government agencies and private sector organizations.

Role of Cooperative Extension in Incident Management

Building upon the National Incident Management System, the National Response Framework (NRF) provides a structure for "implementing national-level policy and operational coordination for domestic incident response" (Emergency Management Institute, 2008). Through an established unified national structure, the key response to an incident starts at the local level

and evolves to higher levels of government as more resources become necessary. The NRF ensures "local jurisdictions retain command, control, and authority over response activities for their jurisdictional areas" (Emergency Management Institute, 2010b).

To manage an incident at the local level requires coordination and preparedness. Because local jurisdictions are often the first to detect an incident and the last to leave the incident site (Emergency Management Institute, 2008), it is imperative that key stakeholders at the local level be identified and made aware of their resources and responsibilities. The NRF identifies Cooperative Extension as a key stakeholder at the local level, at which stakeholders include "environmental and natural resources agencies," and at the state level (Emergency Management Institute, 2008). It further describes the role of the agency at the local and state level as collaborating with the local and state emergency managers during planning development and contributing key resources during the response and recovery phases of emergency management (Emergency Management Institute, 2008).

The role of Cooperative Extension as defined by the NRF is consistent with Texas AgriLife Extension's identified role during a disaster. AgriLife Extension is an "education agency that extends research-based knowledge to enhance the well-being and prosperity of Texans" (Vestal & Matthews, 2008), not a first responder agency. Although the agency has responsibilities in all four phases of emergency management, primary commitments relate to public outreach and communications during preparedness, mitigation, and recovery (Vestal & Matthews, 2008).

Need for Training Cooperative Extension Personnel

Preparedness is a primary commitment Texas AgriLife Extension makes to the agencies and people of Texas (Texas AgriLife Extension Service, 2010). According to NIMS, preparation

is a continuous cycle of planning, organizing, equipping, exercising, evaluating, taking corrective action, and training (Emergency Management Institute, 2010b). To identify limitations in plans and communications, training is essential to agency success during an incident (Emergency Management Institute, 2010a).

Procedures

Opportunities for ICS and NIMS Training Provided by FEMA

In 1947, the Civil Defense Program was established under the Department of Defense, followed by the formation of the Federal Emergency Management Agency (FEMA). In 1979, the Civil Defense Staff College (CDSC), United States Fire Administration, and National Fire Academy became part of FEMA, and the CDSC was re-designated as the Emergency Management Institute (EMI). Today, the EMI serves as the national focal point for the development and delivery of emergency management training to enhance the capabilities of federal, state, local, and tribal government officials, volunteer organizations, and the public and private sectors to minimize the impact of disasters (Emergency Management Institute, 2010a).

The EMI Independent Study Program was developed in 2007 as self-paced courses for emergency managers and the general public. The program is a Web-based distance learning curriculum that includes 62 courses. The courses support the nine mission areas identified by the National Preparedness Goal: incident management, operational planning, disaster logistics, emergency communications, service to disaster victims, continuity programs, public disaster communications, and integrated preparedness and hazard mitigation. The primary audience for the independent study program is “national” emergency response and recovery personnel of the U.S. However, other emergency management personnel and U.S. residents can take these

courses, which are free for U.S. residents with deliverable postal codes (Emergency Management Institute, 2010a).

Texas AgriLife Extension Requirements for Incident Management Training

Currently, Texas AgriLife Extension has a training plan in place for personnel at the local and state levels that includes formal federally led training, training developed by Cooperative Extension, and online self-study training. The training plan is based on the requirements of membership in the State Emergency Management Council (SEMC). Texas AgriLife Extension became a member of the SEMC in 2006, requiring the agency to participate in all planning, exercise, response, and recovery actions through the Texas Division of Emergency Management, including federally coordinated training and exercise actions (A. Vestal, personal communication, September 15, 2010). Involvement with the SEMC allows Texas AgriLife Extension to integrate and communicate with other state agencies involved in emergency management so that all actions are unified at the state level. This is a key connection that many other state extension services lack (A. Vestal, personal communication, September 15, 2010).

Texas AgriLife Extension began training with the EMI Independent Study Program in 2006 by requiring the IS-700.a: National Incident Management System (NIMS), An Introduction course for all county extension agents in Texas. In 2010, the requirement changed from IS-700.a to IS-100.a, Introduction to Incident Command System (Texas AgriLife Extension Service, 2010). This requirement served as a blanket requirement so that all county extension agents, regardless of their involvement with emergency management programs, have an introduction to the unified structure of emergency management presented by the course. Additional requirements for Cooperative Extension strike team members, rapid response team members, and personnel with involvement at any level of an emergency operations center or district disaster

committee include IS-800.b: National Response Framework, An Introduction; IS-200.a: ICS for Single Resources and Initial Action Incidents; and ICS 300, an 18-hour face-to-face class (A. Vestal, personal communication, September 15, 2010). These requirements cover the basic responsibilities that Cooperative Extension personnel may be required to fulfill as part of their involvement with Cooperative Extension emergency management programs.

Outcomes

At the state level, Texas AgriLife Extension acts as a support agency to lead state agencies (LSAs) directing state Emergency Support Functions (ESF) as identified by the NRF. ESFs supported by Texas AgriLife Extension include (AgriLife Communications, 2010):

- ESF #4: Firefighting (LSA: Texas Forest Service);
- ESF #8: Public Health and Medical Services (LSA: Texas Department of State Health Services);
- ESF #11: Agriculture and Natural Resources (LSA: Texas Animal Health Commission for Animal Issues and Texas Department of Agriculture for other agriculture issues);
- ESF #14: Long-Term Community Recovery (LSA: Texas Division of Emergency Management); and
- ESF #15: External Affairs (LSA: Texas Division of Emergency Management).

At the local level, Texas AgriLife Extension supports Department of Homeland Security target capabilities in the mission areas of prevention, protection, response, and recovery. These are identified by Extension as (Texas AgriLife Extension Service, 2010; U.S. Department of Homeland Security, 2007):

- general, including planning and community preparedness;

- prevention, including working with volunteers, environmental and public health education, wildfire prevention and mitigation, and citizen preparedness for evacuation and shelter-in-place;
- protection, including food and agriculture safety and defense;
- response, including animal health emergency support and emergency public information; and
- recovery, including economic and community recovery.

To operate successfully at the local and state levels, Texas AgriLife Extension supports and manages an extensive internal network of approximately 90 subject matter experts on seven incident resource teams, six livestock specialists on four state rapid response task forces, 10 agency liaisons at the state operations center, at least one agency liaison on each of the 22 district disaster committees, 38 county extension agents on six agriculture strike teams, 30 county extension agents on six recovery strike teams, and 500 other county extension agents in local jurisdictions (Harris, 2010; Texas AgriLife Extension Service, 2010).

With such an extensive network of agency personnel involved with emergency management on both the local and state levels, Texas AgriLife Extension's Office of Homeland Security and Emergency Management provides access for personnel to appropriate trainings and exercises so that they are ready when an incident occurs. The NRF identifies training of personnel and participating in interagency exercises as responsibilities of Cooperative Extension at the local and state levels (Emergency Management Institute, 2008). Training and exercise requirements are defined broadly by the NRF and, therefore, are translated broadly by Cooperative Extension leadership.

Discussion

Following the federal adoption of a standardized emergency response system based on ICS and NIMS, multiple stakeholders in incident management were identified at the local, state, and national levels. Cooperative Extension was recognized as one of these stakeholders on two levels—local and state. With professionals in nearly every county in every state in the U.S., in addition to district, regional, and state roles, focused on public outreach, Cooperative Extension is uniquely poised to play significant roles in management of natural and man-made incidents. However, Cooperative Extension personnel must be trained in incident management procedures to serve their communities correctly, efficiently, and successfully.

In Texas, ICS and NIMS training requirements have been implemented with consideration of the multiple levels of involvement Cooperative Extension professionals may have in incident management. The requirement for all county extension agents to complete at least a basic level of training demonstrates Texas AgriLife Extension's commitment to preparedness on the local level, and that commitment is reinforced by additional requirements for Texas AgriLife Extension professionals who want to serve in incident management capacities beyond the local level. As a result of these training requirements, Texas AgriLife Extension prepares its employees to participate in planning incident responses, in addition to mitigation of, response to, and recovery from incidents. Participation by Cooperative Extension employees in each of these activities, particularly on local and district levels, in turn contributes to the resiliency of communities to natural and man-made incidents.

The training required by Texas AgriLife Extension may serve as a model for other states, particularly those that are or could be impacted by a wide range of incidents. Training should include, at a minimum, a basic course about NIMS. Courses also are available in specialties such

as hazardous materials, animals in disaster, and volunteer management. In addition, the incorporation of Emergency Management Institute Independent Study Program courses into training programs is cost effective, as these courses are available online and for free to U.S. residents. Combined with the broad definition of training presented in National Response Framework, state Cooperative Extension services can—and should—develop and implement training programs for Cooperative Extension professionals serving communities at all levels.

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Matching Millennials' Motivations: Developing Strategic, Targeted Recruitment Materials to Increase Enrollment in Academic Programs focused on Agriculture

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Abstract:
Agriculture continues to struggle to find enough qualified students to advance the industry. In order to increase enrollment at colleges of agriculture, recruiting practices need to improve. This study assessed the efficacy of message strategies and message channels for recruiting students into academic programs with low enrollment, as well as testing actual recruiting materials and messages. Focus groups were conducted with agriculture student recruiting prospects outside of the department of interest to address the study's objectives of 1) identifying the most effective message strategies and message channels to reach and attract potential students, and 2) conducting testing of strategically developed recruitment materials and messages. Results indicated that positively framed contextual messages and job stability as a message theme would be most effective for recruiting purposes with this audience. Participants preferred messages delivered through in-person interactions, targeted online delivery of advertisements, and campus publications. Additionally, findings showed participants wanted materials to be in full color with pictures and include messages with statistics on the industry, online videos ranging from 1-2 minutes, videos placed on a Web site based on user interest, and testimonials from a range of individuals in the industry. Participants in this study were mixed on the perceived effectiveness of Facebook advertisements, indicating a need for future research in this area. The results of this study indicate an increased need to target recruitment efforts through a strategic communication process. This research has implications for recruiting the Millennial generation using both gain and non-loss framed messages.

Keywords: student recruitment, college of agriculture, career choices, college students

Introduction

There continues to be a shortage of qualified graduates for agricultural job openings in the United States (Goecker, Smith, P. G., Smith, & Goetz, 2010). Between 2010-2015, it is estimated there will be 54,400 job openings available for college graduates with degrees in agricultural, food, and natural resources each year (Goecker et al., 2010). Of the open positions, it is anticipated 53,000 qualified graduates will be produced. However, only 29,300 of these jobs will be filled by graduates with degrees from colleges of agriculture and life sciences, forestry, and veterinary medicine, and 24,200 jobs will be filled by graduates from related higher education programs (Goecker et al., 2010). Five years ago, 32,000 qualified graduates were expected to be produced by colleges of agriculture and life sciences, forestry, and veterinary medicine; 17,000 were expected to be produced by the allied higher education programs (Goecker, Gilmore, Smith, E., & Smith, 2004).

One reason for this national shortage of qualified agriculture graduates may be attributed to a decline in student enrollment in colleges of agriculture (COAs). Bobbitt (2006) reported COA enrollment trends at eight colleges located in the central United States. Bobbitt revealed declining enrollment for six of the eight colleges from the fall of 2001 to the spring of 2004. Traditionally, COAs spend a large amount of time, energy, and financial resources on their efforts to recruit students (Washburn, Garton, & Vaughn, 2002). Despite efforts to draw students into agriculture-related majors, COAs rarely use empirical research data in crafting recruitment messages (Washburn et al., 2002).

One model that offers insight to college recruitment is Chapman's (1981) model of student college choice. Chapman discusses three external factors that determine college choice when combined with student characteristics. These external factors include the influence of

significant persons, the fixed characteristics of the academic institution, and the institution's own efforts to communicate with perspective students. The scope of this paper specifically examines the effectiveness of the institution's efforts to communicate with perspective students.

Logically, if an academic institution is communicating poorly with potential students, the students will likely not possess an accurate, complete awareness of the institution's majors and programs of study. Without an accurate awareness of the potential academic options offered by a college, Hossler and Gallagher (1987) warn that students "may mistakenly eliminate an institution which is potentially a good choice due to a lack of awareness of the range of institutions as well as the accurate information about institutions" (p. 215). This same lack of awareness could apply to individual programs. Baker, Irani, Abrams, and Telg (2010, June) showed that students have a preference for academic programs that have high visibility (i.e., most people know about the program). Moreover, Wildman and Torres (2001) showed that recruiting practices from individual academic departments were more influential than from the COA as a whole for students' decision to select their major. To this point, Lingenfelter and Beierlein (2006) recommended that recruiting practices should be geared toward specific interest areas, not agriculture in general.

Regarding specific departments in COAs, a recent study addressed student motivations to enroll in a low enrollment academic major, ornamental horticulture. Baker et al. (2010, June) concluded the largest barrier for enrolling in the program was a lack of awareness about that field of study and its related careers. Myers, Breja, and Dyer (2004) found a similar lack of awareness relating to job opportunities in agricultural education. They recommended addressing the placement of past graduates of the program and developing specifically targeted placement

programs. Likewise, Bobbitt (2006) and Williams (2007) both found job availability to be important in students' selection of major.

While job availability is important, career interest is also an important part of the career-decision process. Krumboltz and Worthington (1999) suggested that secondary students should expand their career interests when making career choices instead of relying on their current interests to make decisions. Similarly, Savickas (1999) said students who were more aware of their options fared better in the transition from school to work. While these studies were intended for high school students, these same principles could apply to post-secondary students. Relating to agriculture, Boumtje and Haase-Wittler (2007) stated the variety of careers available in agriculture should be promoted. This could help students better understand their options.

Though not as influential as on-campus recruiting activities and personal conversations, students surveyed by Bobbitt (2006) indicated that information about the university, college, and degree program were the most used recruiting materials and degree program information online was the most influential published recruiting practice.Rocca and Washburn (2005) also found degree program information was used the most and considered to be the most influential for students' college decisions.

The students currently being recruited into college academic programs are in a generation known by multiple names, including Millennials, igeneration, generation Y, or generation ME (Twenge, 2006). For the purpose of this study, 1982 was used as the reference date for the start of the Millennial generation (Twenge, 2006). The generation in which a person was born has been determined as being more influential in the career decision making process than income, sex, or education (Twenge, 2006). As a result, it is essential that researchers work to determine

how this generation communicates and interacts (Provitera-McGlynn, 2005) in order to develop recruitment materials that are effective.

Recruitment is not a concern unique to higher education. Marketing and advertising disciplines have looked at recruitment issues through the lens of loss aversion theory and have used the theory to develop campaigns for recruiting new customers. Loss aversion refers to people's desire to avoid losses more than desiring to acquire gains (Tversky & Kahneman, 1991). There are three essential tenants represented by a value function that Traversky and Kahneman suggest are used by a decision maker, like a student choosing a major. The first of these is reference dependence, which is determined uniquely based on an individual's beginning reference point to the decision and its accompanying factors. The second is loss aversion, which is higher in the negative domain than the positive. The third component is diminishing sensitivity, which is a function of the marginal value of gains and losses decreasing with their magnitude (Tversky & Kahneman, 1991). The grouping of these components equates in a value function that is an asymmetric S-shape, which demonstrates that an "impact of a difference on a dimension is generally greater when the difference is evaluated as a loss than when the same difference is evaluated as a gain" (Tversky & Kahneman, 1991, p. 1040). Additionally, it has been suggested that losses are psychologically twice as powerful as gains (McGraw, Larsen, Kahneman, & Schkade, 2010). Thus, recruitment efforts using loss aversion theory focus on what people may lose by not taking advantage of the academic or career opportunity being advertised as opposed to what they may gain by taking advantage of an opportunity.

Purpose & Objectives

The purpose of this study was to determine how to reach and attract potential students to majors and careers in specialized academic programs of agriculture more efficiently and

effectively. Ultimately, the goal is to use this information to improve educational programs designed to raise awareness and motivate career choice among students in post-secondary academic programs. For the purpose of this study, one academic program – ornamental horticulture – was chosen. Ornamental horticulture is an example of an agriculture program area that is struggling nationally to find enough qualified students to meet industry demands (Rom, 2004). Like agriculture and natural resources overall, the industry of ornamental horticulture has a surplus of jobs when compared to the number of applicants being produced (National Center for Educational Statistics, 2007). Additionally, ornamental horticulture enrollment dropped almost 40% from 2003 to 2007 (FAEIS, 2008). In this study, ornamental horticulture has been defined as a discipline of horticulture concerned with growing and using flowering and ornamental plants for gardens, landscapes, and floral display. The following research objectives were developed to guide this study:

- Objective 1: Identify the most effective message strategies and message channels to reach and attract potential students to majors in specific academic programs of agriculture.
- Objective 2: Conduct testing of strategically developed recruitment materials and messages.

Methodology

This study used a set of two focus groups comprising representative members of the target population of college students. A market research firm was hired and used Computer Assisted Telephone Interviewing (CATI) telephone random digit dialing (RDD) sampling to qualify potential participants. Probability samples were generated using a predetermined sampling frame based on demographic variables for both focus groups. The focus groups were conducted February 23, 2010. Prior focus group research in this same area determined students

who were already enrolled in a college of agriculture and were early enough in their program to change their major were the best choices for recruiting efforts (Baker, Irani, & Abrams, 2010, February). Thus, the sampling frame for this study was students enrolled at a large land grant institution in the southeastern United States with 30-60 hours completed toward their degree and who were not already enrolled in a plant-related major. Ten students were selected for participation in each group for a total sample of 20 participants.

Focus group research is common in marketing studies due in part to the researchers' ability to determine emotional and unconscious motivations, which are sometimes difficult to assess in conventional survey research (Morgan, 1998). A protocol was developed to guide both focus groups using the procedures set forth by Krueger (1998). As this study was designed to test the previous Baker et al. (2010, February) study and move forward with recommendations from the prior research, the protocol in the current study was based on the same protocol. One major difference in the protocol was a new focus on testing specific messages and recruitment materials based on the recommendations from the previous research. As a part of the protocol procedure, participants were asked to evaluate recruitment messages, a postcard, and two Web sites, one of which included three short recruitment videos (approximately 30 seconds each). The protocol was used to guide the discussion and to keep the focus groups consistent; it was reviewed by a panel of experts for face and content validity. The same experienced, formally trained moderator was used for both focus groups to ensure credibility. All focus groups were video and audio recorded for transcription. Transcripts from the focus groups were imported into Weft QDA software to be analyzed for themes accordance with Glaser's (1965) constant comparative method. The constant comparative method involves making comparisons between what is found to what was found prior in the analysis for every incident, allowing coding and analysis to occur

simultaneously instead of coding and then analyzing (Glaser, 1965). To ensure veracity, an audit trail was kept and a member check was completed.

Results

Objective 1: Identifying the Most Effective Message Strategies and Message Channels to Reach and Attract Potential Students.

In an effort to address this research objective, participants in both focus groups were asked questions about the most effective strategies for reaching students with messages about majors and/or careers. Major themes about what messages would be effective in recruiting students emerged. Key career messages that resonated with participants were job stability/availability and positive contextual messages. Message channels participants thought would be the most effective ranged from high-touch channels to online channels, and campus publications.

Job stability/availability.

One of the themes participants found of major concern was the slowed economy, which often translated into anxieties of about being able to find a job when they completed their degree. One participant expressed this concern as "I feel like one of the main concerns for college students now is like not having a job when they get out of college." Participants said they would be attracted to recruitment messages that mentioned there were plenty of jobs within the industry. Specifically, one participant expressed "… if there is like an ample amount of jobs that's probably a really big deal to tell people that." Beyond getting a job after graduation, participants also expressed concern for the stability of that job by saying "job stability nowadays is important." Moreover, participants expressed an attraction to messages related to the long-term prospects of a career. One participant summed up the discussion by saying "knowing if

available jobs is like good to know, but maybe like if the industry is increasing or decreasing, like what are the chances that you'd still have a job in 5 or 10 years."

Positive contextual messages.

Other messages participants were attracted to were positive contextual messages. These messages conveyed the positive aspects of what a student could expect if they took a position in a specific career field. A common message was conveying the passion for a job from a professional within the industry. Participants wanted to know the job would be fun for them and not harm others. One participant expressed this sentiment as "like the passion within the industry …how it relates to your life and how it's like ethical and a fun job type thing." Additionally, participants wanted to know their life would be better because of the career choice they made. Thus, career messages that offered more than a paycheck but a chance to make a difference were valued by participants. One participant conveyed this by saying "and like how taking your career, like turning your career in that certain direction would better your life." While participants desired to be happy and fulfilled, they also expressed a desire to make others' lives better because of their career. Messages about careers that participants felt would influence them were related to making other people's lives better in some way. One participant communicated this by saying "like a job that satisfies people. Like I know for me I know I really like to make other people happy."

High-touch channels.

One of the preferred message channels of participants to receive career and major information was high-touch channels, meaning channels that involved personal human contact. Some of the channels mentioned consistently were advisors' offices, seminar classes, career fairs, and preview or orientation programs. Specific to advisors, students expressed that they

listened to advisors advice and suggested “yeah, like you could ask your advisor or they could have slips or something.” Seminar classes were thought by participants to be a place where students sought advice on careers. One participant expressed this by saying “I think that’s what that class is mainly for, to see like your options for that major… so I think yes, something like that would work.” The participants expressed similar sentiments about career fairs and previews or orientations. Participants thought these situations were ideal for students to pay attention to career or major information. One participant conveyed this by saying “that’s when the kids are really like, what’s my major going to be?”

Online channels.

Participants in both groups suggested online channels of communication to deliver career and major information. Online advertisements were suggested by participants as a possible way to attract students. One participant said “Web ads that’s another good place to put them.” More specifically, participants said these advertisements should be in places students already go to seek career and major advice online. Some participant suggestions were SAT or College Board. One participant expressed the point in targeted advertisements by saying “or like put ads online but like when we’re specifically searching, like people search majors, like ad majors or something like that out there. But not just like random ads for it.” Another place where participants expressed they would pay attention to online advertisements were before or during online television programming or videos. One participant summed this idea up by saying “like the things before clips, like those on YouTube and all these other video sites. Those are things that like that a lot of times you can’t avoid them. You’re forced to watch them. And they’re like shorter usually and more effective since they have less time than regular commercials.”

Another participant stated “I’ve seen a lot of them that made me really stop and think and go like wow! That was awesome!” However, when these online advertisements were not targeted appropriately participants did not trust them. As expressed by one participant, “sometimes online ads are creepy and you don’t like know who they come from.” Overall, participants expressed that online targeted advertisements would catch their attention, which would lead them to a Web site for more information.

Campus publications.

Participants said they paid attention to advertisements in campus publications but were not attuned to messages in other publications like magazines or the city newspaper. One participant voiced this as “I sometimes read the Campus Talk just ‘cause like it has funny ads in it and advertisements, but I don’t really read anything else.” The general consensus of the groups was that campus publications were convenient for them to pick up and take with them to read between and sometimes during classes. Participants conveyed that they did not read newspapers or magazines; as one participant said “yeah, I don’t read newspapers or magazines at all.” Other campus printed pieces attracted students, like posters and flyers in the dorm mailboxes. One participant said “a poster would catch your eye too though…so like sometimes you’re sitting in the waiting room for your name to be called for the advisor. I look around or I try to read, but if there’s a poster that’s got beautiful flowers I might read that and ask questions.” An additional place participants believed would be good to place career or major messages were the dorm mailboxes. One participant said “or the mailboxes like they put in the dorms. I like look at it and if it catches your eye and you can keep it.”

Objective 2: Conduct Testing of Strategically Developed Recruitment Materials and Messages.

In an effort to address this objective, the participants were exposed to sample recruitment materials developed strategically from previous research (Baker, et al., 2010). These materials included a postcard designed to be given away at career and/or major fairs, three Facebook advertisements, a traditional major Web site, a career Web site with interactive features including three short recruitment videos. The key findings from testing these materials were that participants wanted full color materials with pictures, statistics and information about an industry where they might find work after graduation, short videos with multiple offerings and progression of topics, and testimonials from a range of people working in the prospective career field. Participants diverged on whether they wanted Facebook advertisements and/or groups, as seen in the following sections.

Full color materials with pictures.

Participants expressed a desire for materials that were full color and included pictures to catch their eye. One participant articulated this by saying “I mean I feel like this industry could be very visually appealing on paper. So just in terms of pictures, it could be like just people standing in fields, that could be a lot more appealing than like [school colors]”.

Specifically, participants thought school colors would blend in with everything else they receive on campus or at career fairs on their campus. A participant expressed this explicitly by saying “like right off the bat, if you’re going to go to a career fair, I’m assuming it’s going to be at [this school]...Every paper that you’re going to get is going to be [school colors].” The idea of recruitment materials needing to stand out from the other mass of materials students receive was a key concept for participants. One summed this up by stating “you can put a lot of colors on just like papers that you’re handing out and I think you could really make it stand out, and if I have a

stack of [school color] papers when I'm going home at least this one might stay on my floor instead of ending up in the trash can."

Statistics and information about an industry.

Participants in both focus groups expressed the desire to have statistics and information available about the industry or major being promoted. Participants liked hearing statistics that specifically related to the size of the industry. One communicated this as "like maybe like, it's say it's a 40 million dollar industry, or like the 12th biggest industry or something." Participants also desired information about how much money they could expect to make and the prospects for jobs in the industry. The participants were not attracted to negative statistics about other industries or other jobs in an effort to recruit them to a new industry. In response to a statistic about job dissatisfaction one participant said "it's kind of mean." Another participant said "I feel like they're trying to like just lure you for no reason. Like I feel like if you want people to come into the career they need to be actually genuinely interested." Overall, participants expressed the desire for statistics and information about the industry they are being recruited by that are positive. One participant said "I think an important thing that they could add is saying something good about the industry. Like, I mean, because it's like I'm interested in that. I'm interested in that but will I make money, like will I have a job? You know saying something good about the industry".

Short videos with multiple offerings and progression of topics.

Participants wanted short videos with information about people and careers in an industry where they make work. Participants in both groups agreed they would not be willing to watch a video that was lengthy. One participant said "… I'm not going to watch a 7 ½ minute video for anything." Participants thought a video that was 1-2 minutes in length would be the most

effective. One participant said “I think a minute to 2 minute video would probably work better.” Participants suggested having multiple short videos broken down by different career or specializations. One participant said “maybe multiple ones depending on which career they liked.” Additionally, participants suggested a possible progression of videos throughout a recruitment Web site, like starting with an overall career video and then moving to testimonials from specific career areas, or begin with a short introduction video of each career and move to a longer video after if students are interested in the first. One participant summed up this idea by saying “…like you have a video and if you wanted to have longer, more in-depth videos, like on a different link like under that so you can, just like, cause it gives a good overview but then have like the more information later”.

Testimonials from a range of people in the prospective career.

One of the aspects participants wanted in recruitment materials was testimonials from people currently employed at different levels within the prospective career field. Participants expressed it would be good to hear from someone similar to their age so they could picture themselves being in that career. One participant said “I want to hear from someone my ageish.” Participants felt that by seeing people who were young and had already been successful in the prospective career that they may also be able to be successful soon after graduation. One participant expressed this by saying “it’s good because it’s showing, look how far you can get so quick.” However, participants also valued testimonials from people who had been in the prospective career for a length of time. One participant explained this as “yeah for a career I would like to have someone who’s been in the field long enough to tell me what it’s about, pros and cons.” Participants expressed a desire to see from the testimonials that people were happy with their career choice and had stayed a long time and were able to support their families

through this career. One participant expressed this sentiment humorously by commented he/she would like to hear a testimonial that said “I’ve been working for 20 years and I haven’t starved yet.”

Facebook advertisements and/or groups.

The participants were mixed on whether or not they saw Facebook advertisements as a good way to reach students with messages about careers and majors. Participants were under the impression that Facebook advertisements were expensive and as a result may not be worth the investment. One participant said “I just don’t know that it’s a good choice to put them [on Facebook] and spend all that money because honestly if I’m on Facebook I’m going to check my messages and check friend requests and then I’m out of there.” Other participants thought the concept of Facebook advertisements made sense for recruiting students who were already interested in that area. One participant said “they are usually good at giving you ads that like are about what you are interested in or what you have like sorta searched for recently or whatever.” Some participants thought the advertisements on Facebook were scams and so they avoided them entirely. One participant said, “I think they’re like scams and stuff.” However, the majority of participants expressed a desire to join groups on Facebook that mirrored their already chosen career path or major. One participant expressed this by saying “…I’m going to become a fan of something I’m already interested in, so I wouldn’t like just randomly join it because I’m there, but it is good to have once you are in that area.”

Conclusions and Discussion

The results of this study indicate a greater need for recruitment materials that are targeted appropriately and designed strategically. Although this study was limited to one institution, key findings suggest recruitment materials should be developed that are segmented for the needs of

different types of students. These findings support previous work by Lingenfelter and Beierlein (2006) who recommend recruiting practices be geared toward specific interest areas. However, this study indicates a need for materials to be developed with multiple target student audiences in mind, incorporating multiple channels and messages.

Messages that were likely to resonate with participants were those that conveyed job stability and availability. This corresponds with loss aversion research, which suggests losses are psychologically twice as powerful as gains (McGraw et al., 2010) and corresponds to previous recruitment studies (Bobbitt, 2006; Williams, 2007). It should be noted that this loss aversion may be due to the current slowed economy and intense media coverage of job losses and shortages.

Participants desired recruitment materials that portrayed positive contextual messages about an industry. They wanted to know specific details about what positives a job could offer. This suggests students are more attracted to messages with gain-frames, which emphasize the advantages of a product or a program in this case. Additionally, this suggests students are less likely to respond to messages with loss-framed appeals, which emphasize the disadvantages of choosing an alternative (Tversky & Kahneman, 1991). This concept was also confirmed by participants' opposition to negative messages against other fields or jobs in general. This is similar to the conclusions of loss aversion theory, which concludes people strongly prefer avoiding losses to acquiring gains (Tversky & Kahneman, 1991). In this study, students were attracted to messages about job stability possibly because these messages convey avoiding loss that could happen if they took a job in an unstable field. Additionally, these results support research on Millenials, who have been taught their entire lives they can do anything and seek

positive motivations for doing so (Twenge, 2006). Thus, it is not surprising that Millenials violate assumptions of the theory by preferring gain frames over loss frames.

High-touch channels of communication were desired by participants. The desire for high-touch channels in recruitment efforts corresponds to Chapman's (1981) model of external factors that are influential in students' choice of where to attend college. In this study, the significant persons who had the most influence in college choice were students' advisors. Of additional importance to participants in this study were high-touch channels with personal contact and the institution's targeted efforts to communicate with prospective students. The institutional programs of most significance to participants were seminar classes, career fairs, and preview or orientation programs. Online channels were deemed as a possible way to attract students in this study; however, participants expressed a need for these messages to be targeted appropriately and only appear in places where they were already seeking career and major information and/or advice.

Campus publications were another channel where students sought career and major information. This study concluded that students would respond to career information in campus publications if it "caught their eye" and addressed their area of interest. This idea is similar to conclusions by Lingenfelter and Beierlein (2006) that recruitment messages should be targeted toward areas of interest as opposed to agriculture in general. Participants reported paying attention to campus publications, fliers, and posters but not noticing community or national publications.

Participants' desire for short videos may be due to their generation's need for immediate information and constant stimulation to be interested (Twenge, 2009). Additionally, it is noteworthy that participants valued testimonials from people in a prospective career. It was not

surprising that participants wanted to see testimonials from people like them, as this is a concept that has been explored in advertising. However, it was unexpected that participants wanted to hear from someone who had been at this career for a long time to show that it was a stable industry. This idea correlates with participants' desire for a job with stability and opportunity for long-term advancement.

Participants' perception that Facebook advertisements were expensive was interesting, considering that Facebook is one of the cheapest ways to advertise to a large group of people in a targeted and direct way. This study indicated that whether or not students responded to Facebook advertisements was an individual decision. As a result, this study concluded Facebook advertisements are worthy of further exploration as an effective delivery method for recruitment messages for at least some students.

Recommendations

The findings in this study may be transferrable and have implications for all academic programs of agriculture, even though this study was limited as a case study of one land grant institution. Recommendations for recruitment messages to target the Millennial generation include messages that convey job stability or availability and positive contextual messages. These results additionally indicate that future recruitment messages should focus on gain frames that emphasize the advantages of a specific academic program of agriculture.

As evidenced by the results of these focus groups, what is important in recruitment materials for this generation of students is full color materials with pictures, statistics, and information about an industry where they would work; short videos with multiple offerings and a progression of topics; and testimonials from a range of people working in the prospective career. As a result, videos embedded in Web sites should include a plethora of information about the

prospective career, including job duties and future job availability. Multiple videos should be developed that are 1-2 minutes in length and feature people in a variety of stages within their career. Web sites should be advertised and marketed through online channels where students are already seeking major and career information and be advertised prominently on all materials delivered through high-touch channels.

While the participants in this study were mixed about whether Facebook advertisements were an effective method of delivery for recruitment and career messages, it is recommended that Facebook advertisements be further explored as a part of the overall recruitment campaign for academic programs of agriculture. This is primarily due to the low cost of advertising on Facebook and the results of previous work that indicates Facebook is a place where students respond to advertisements that are directed to their special interests (Baker et al., 2010, June). Additionally, Facebook allows for targeted advertising, which responds to students' desire for messages to appear only after they were seeking career and major information.

Finally, the results of this study indicate an increased need to target recruitment efforts through a strategic communication process, which is recommended in corporate models of communication (Smith, 2002). Strategically developed materials should be based on empirical research, something which research tells us has not been done in programs of agriculture in the past when crafting their recruitment messages (Washburn et al., 2002). The students within this generation and in this study consider themselves unique individuals and believe they are highly valued (Twenge, 2009). As a result, they want materials targeted to their specific wants and desires in a program and in a future career. It is recommended that future research be conducted in a quantitative research design to test materials developed using the targeted, strategic strategies resulting from qualitative research such as used in this study.

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"Narrowing the Farm-to-Plate Knowledge Gap through Semiotics and the Study of Consumer Responses Regarding Livestock Images"

Research Paper

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Abstract

It has been suggested that a farm-to-plate knowledge gap exists between farmers and consumers. In addition, previous studies have concluded that U.S. citizens do not have accurate knowledge or perceptions about agriculture. It is thought that this absence of knowledge and existing misconceptions may be due to the images consumers see regularly through the media. In this research study, researchers used a directly administered questionnaire to evaluate consumers' responses regarding the comparison of two livestock images. The study was conducted at the 2009 Ohio State Fair. Through voluntary participation, research participants answered questions regarding their perceptions of traditional and conventional livestock housing methods by viewing two images. In addition, participants were asked to justify each of their responses through oral reasoning. Questionnaires were completed by 508 participants, of which 502 were deemed usable. Results indicate participants are somewhat knowledgeable about livestock housing methods, but the perceptions and justifications of the respondents are not always accurate. The results also indicate agricultural images, as well as images regularly seen in the media, may influence such perceptions. In order to narrow the farm-to-plate knowledge gap, it is important for the agriculture industry to effectively improve the knowledge and perceptions of agriculture amongst consumers.

Keywords: semiotics, directly administered questionnaire, agricultural knowledge, agricultural perceptions, images, knowledge gap theory

"Narrowing the Farm-to-Plate Knowledge Gap through Semiotics and the Study of Consumer Responses Regarding Livestock Images"

Introduction

Orion Samuelson, a veteran farm broadcaster who aired on WGN Radio and the U.S. Farm Report once said "Just because you live in a rural area with a small town close by, don't assume the people on Main Street in that small town know what's happening out there in the fields" (American Farm Bureau, 2001, para. 2). Andre and Jean Mayer (1974, p. 84) emphasize this point as well saying in reference to agriculture that "…an enormous majority, even among well-educated Americans, are totally ignorant of an area of knowledge basic to their daily style of life, to their family economics, and indeed their survival." This quote provides much reality as less than a fourth of the population now lives on a farm, compared to over half of the population in the early 20th century (Dimitri, Effland, & Conklin, 2005). Technology is the driving force behind these shrinking numbers. Advanced technology has increased U.S. farm output, allowing more individuals to leave the farm for an alternate occupation (Dimitri et al., 2005; Smart 2009). The majority of consumers are now generations removed from the farm (American Farm Bureau, 2001; American Farm Bureau, 2007). As a result, the publics' perception of agriculture no longer corresponds with the realities of agriculture (American Farm Bureau, 2007). Rob Smart from the *Huffington Post* has recognized this occurrence and has titled it the "farm-to-plate knowledge gap" (2009).

Literature Review and Theoretical Framework

Agriculture Literacy

Agriculture literacy is a term given to address the knowledge and perceptions of agriculture held by the general public (Wright, Stewart, & Birkenholz, 1994). The National Research Council (1988) indicates that being agriculturally literate means an individual

understands the history of agriculture as well as its current economic, social, and environmental impact. However, many research studies have shown the general public does not possess accurate knowledge and perceptions of agriculture (Frick, Birkenholz, & Machtmes, 1995; Duncan & Broyles, 2006; National Research Council, 1988). It is important for individuals to have some knowledge of agriculture since their survival depends on it (Frick et al., 1995). As the U.S. population becomes more suburbanized, it is suggested that individuals are becoming less knowledgeable about agriculture (Duncan & Broyles, 2006). Additionally, the influences of media, acquaintances, and involvement in various organizations are impacting the knowledge and perceptions individuals, specifically those in younger generations, have in regards to agriculture (Duncan & Broyles, 2006).

Livestock housing in Ohio

During 2009, Ohio was home to 74,900 farms (National Agricultural Statistics Service, 2010). Of the common livestock raised in Ohio, there are approximately: 293,757 beef cattle; 271, 938 dairy cattle; 1.8 million hogs; 27 million laying hens; and 49.6 million broilers (National Agricultural Statistics Service, 2009). The majority of these animals are raised conventionally. For the purpose of this research, conventional livestock housing is defined as any operation where a large number of animals are confined and raised in a localized area (indoors or out), where food is brought to them (U.S. Environmental Protection Agency, 2010). Traditional housing is defined as housing where livestock are not confined and have the ability to graze and obtain their own food.

In the Midwestern United States, the swine and poultry industry has seen a dramatic increase in the number of conventional farms over the last several years (Sharp, Roe, & Irwin, 2002). A gap exists in the literature surrounding both a clear definition of and the precise number

of animals raised using conventional production methods. Although it is not precisely known how many animals are raised in conventional housing in the state of Ohio, estimates can be drawn based on numbers provided by several sources. Ohio's average hog farm has approximately 492 hogs. Additionally, the average laying hen farm has approximately 5,151 laying hens, while the broiler farms have an average of 62,776 broiler chickens (National Agricultural Statistics Service, 2009). Due to the large numbers of individual animals on these farms, estimations are that the majority of these farms are conventional in nature, since housing this many animals on an open-range farm would require an inordinate amount of acreage.

In addition, the average number of dairy cattle per farm in Ohio is 74.5. The dairy industry has also been moving toward more conventional or partially conventional housing (Sharp et al., 2002). However, it is estimated that a smaller proportion of the dairy farms in Ohio are conventional compared to the swine and poultry facilities. The beef industry in Ohio has not seen a large increase in conventional housing (Sharp et al., 2002). Thus, it is estimated that more beef farms consist of traditional housing rather than conventional housing.

Semiotics and Images

Semiotics is a theory of signs and codes (Blaney & Wolfe, 2004; Eco, 1979). Visual signs help one interpret a message, while a code helps an individual understand what the message means (Moriarty, 2005). This theory suggests that signs and codes are closely related to language and everyday communication of a culture (Blaney & Wolfe, 2004). Thus, words and visual images promote a cultural ideology. Each visual image or word is composed of a combination of cultural ideologies, creating a sign system. A sign system is a group of signs that imply meaning for one sign or image (Blaney & Wolfe, 2004).

When an individual views an image, there are many ways the image can engage the individual (Messaris & Moariarty, 2005). Images can produce a representation to everyday life. If an individual is able to relate an image to their life, the individual is likely to have an emotional connection with that image. The composition of an image is also said to have the ability to manipulate an individual's point of view, thus influencing their perceptions. These principles of image power seek to address how people learn from the images they see (Messaris & Moariarty, 2005).

In the study of semiotics, signs are defined as anything that represents another entity. Thus, the meaning of a sign is determined by a following thought or action (Hoopes, 1991; Moriarty, 2005). According to Saussure, a sign may also be referred to as a signifier (Moriarty, 2005). The signifier then promotes the content that the sign stands for, which is also known as the signified. Peirce created a model similar to Saussure's idea of the signifier and the signified, but he added the concept of the interpretant. The interpretant is established when a sign generates a mental idea in one's mind (Moriarty, 2005).

A subject that becomes imperative is the relationship between the sign and the object or the signifier and the signified. These relationships include iconic, indexical, and symbolic relationships. An iconic relationship is when the sign and the object look alike or similar, like a photograph and a portrait (Moriarty, 2005). Peirce's examples of smoke to fire or symptom to disease are examples of the indexical relationship; this is when the sign and object are indicators of each other. Lastly, the symbolic relationship describes when the sign is a symbol for the object, like a flag as a sign and its corresponding country as the object (Moriarty, 2005). Understanding the relationship between the sign and the object allows researchers to analyze the resulting mental image that is likely to occur among viewers.

An additional point for analysis between the sign and the object was extended by researchers Barthes and Hall (Moriarty, 2005). Their analyses include connotation and denotation. Connotation is referred to as the meaning that is established by the object; the meaning of an object is generally cultural. Denotation is defined as "…the direct, specific, or literal meaning we get from a sign. (Moriarty, 2005, p. 231)" An example that demonstrates the functionality of connotation and denotation is as follows: a magazine advertisement shows a picture of a tractor, the tractor is at the denotative level. The connotative level of the advertisement might associate the tractor with terms such as farm, farmer, country, and crops. Connotation and denotation become especially important when studying visual communication and the influence of visual images in advertising (Moriarty, 2005).

Knowledge Gap Theory

Knowledge Gap Theory suggests that information is obtained more efficiently by those who have a higher socioeconomic status rather than those who have a low socioeconomic status (Tichenor, Donohue, & Olien, 1970). This theory becomes very valuable when studying mass media infusion. It has been suggested that mass media infusion is absorbed at different rates across different socioeconomic groups, thus impacting the rate of information obtained by individuals (Tichenor et al., 1970). Knowledge gap is often measured by determining the correlation between one's knowledge and their level of education (Weenig & Midden, 1997). It has been suggested that knowledge gap could also be attributed to a lack of motivation to cognitively digest certain information (Weenig & Midden, 1997).

Knowledge gap is closely related to the digital divide suggesting those who have lower incomes and reside in rural areas have less access to media outlets (Rainie et al., 2003). Alternatively, those with higher levels of education, higher income, and residence within an

urban or suburban location, generally have abundant media access (Rainie et al., 2003). When discussing the knowledge gap in agriculture, those who have experience with agriculture do not have the resources readily available to share their knowledge within media outlets. In addition, the agricultural information in the media often tends to be misguided. Thus, those who regularly use media outlets are receiving misconstrued messages about agriculture and their agricultural knowledge becomes based on these messages.

Purpose

It is important for agricultural educators and communicators to regularly assess the knowledge and perceptions individuals have in regards to agriculture. The purpose of this study was to evaluate the perceptions and knowledge of livestock housing methods held by a sample of citizens attending the Ohio State Fair. These participants compared images of conventional and traditional livestock practices. In addition, this study sought to explore the thought process of consumers when viewing agriculture images by analyzing their qualitative responses. This information should provide beneficial insight for agricultural professionals. The information may be used to improve educational mechanisms as well as creative image advertisements.

The following objectives guided this study:

1. To evaluate consumers' perceptions of conventional and traditional livestock housing in Ohio.
2. To determine if consumers think animals are healthier and more protected from disease in one housing method vs. another.
3. To evaluate consumers' perceptions of safe and wholesome food products and consumer friendly prices as related to livestock housing methods.

Methods

In order to fulfill the purpose and objectives of this study, researchers conducted a directly administered questionnaire to individuals attending the Ohio State Fair. Directly administered questionnaires are referenced by Ary, Jacobs, Razavieh, and Sorensen (2006) as a research tool that enables researchers to gather information from an array of individuals who have gathered at common place for a common purpose. The ability to guide participants through the questionnaire is a known benefit of directly administered questionnaires. This is considered a benefit as it allows the researcher to answer any questions the participants may have (Ary et al., 2006).

A convenience sample was used for this study. Convenience sampling involves using readily available subjects as the study sample, thus making it a weak sampling procedure (Ary et al., 2006). Convenience sampling was used in this study because it was difficult to predict the population elements that the study would encounter, thus limiting enumeration required for probability sampling (Ary et. al., 2006). The convenience sample was comprised of volunteers who attended the 2009 Ohio State Fair. Data collection was obtained at a booth in the Agriculture and Horticulture building. Participants voluntarily participated in the study and were recruited by a sign above the research booth that read "Are you 18 years or older? Are you an Ohio resident? Do you want Free Ice Cream?" Six individuals administered questionnaires over a period of eight days. Each participant was given a coupon for a free single-dip ice cream cone from the Ohio Dairy Producers booth at the fair. A sample of 508 questionnaires was collected, of which 502 questionnaires were deemed usable and were evaluated. The six questionnaires dismissed from the research were unusable due to lack of responses or Ohio citizenship. In

addition to the 508 participants who participated in the study, 57 other individuals declined participation after inquiring about the study.

Training was required for all questionnaire administrators prior to data collection. The training allowed the administrators to practice and become familiar with the questions, learn how to listen carefully and pick out important details, as well as eliminate personal bias when talking with participants. Two prescreening questions were asked at the beginning of the questionnaire to establish that the participants were adults and Ohio citizens. In addition to demographic questions, questions regarding a comparison of two images were asked. One image contained several smaller images of conventional livestock housing while the other contained several smaller images of traditional livestock housing. The participants were asked to determine what picture best represented how most livestock are raised in Ohio, showed the healthiest animals, showed the most humane treatment, showed animals most protected from disease, would produce the most safe and wholesome food product, and would produce the most consumer friendly food prices. Participants were then asked to provide justification for each of their responses. Each questionnaire took approximately 5-10 minutes to administer. A panel of researchers and Ohio Farm Bureau staff evaluated the questionnaire instrument to ensure validity.

Upon the completion of the data collection, data were entered into SPSS© and basic quantitative descriptive statistics were calculated. Qualitative information was evaluated through the use of open-coding and identification of common responses within the data.

Results

Researchers collected demographic information on age, ethnicity, gender, and highest level of education. The mean age of the participants was found to be 44.35, with a median of 46,

and a mode of 50. Various ethnicities were represented among the participants; however, the Caucasian ethnicity was most abundant with 412 (82.1%) participants. Gender was not asked, but was identified by the researchers. More females participated in the research than males, as the sample was composed of 315 (62.7%) females. The most abundant level of education among the participants was a bachelor's degree, held by 181 (36.1%) respondents.

The first research objective was to evaluate consumers' perceptions of conventional (see Figure 1, picture A) and traditional (see Figure 2, picture B) livestock housing in Ohio.

Figure 1
Picture A – Conventional Livestock Housing Methods

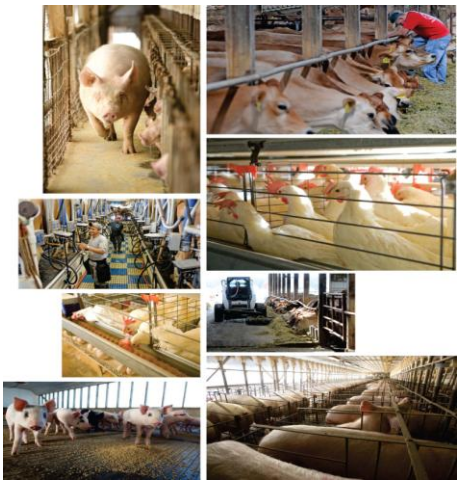
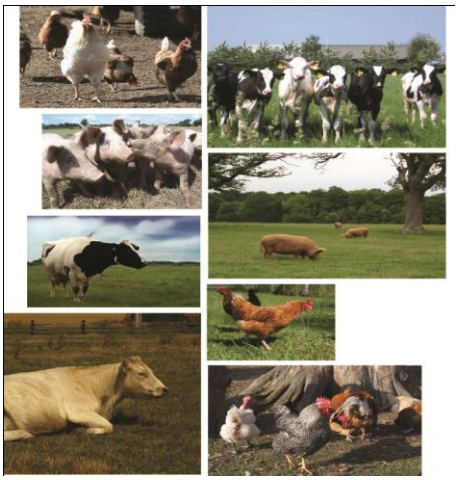


Figure 2
Picture B – Traditional Livestock Housing Methods



Of those responding, 329 (65.5%) participants indicated that conventional housing (figure A) was used to raise the majority of livestock in Ohio. A summary of the response frequencies can be seen in Table 1.

Table 1

Consumers' perceptions of most abundant livestock housing method.

Image Selection	*f*	%
Image A	329	65.5
Image B	123	24.5
Both Images	45	9.0

When the participants were asked why they felt livestock were raised one way versus another, several responses were given. Of those responding, the most common reasons for selecting conventional livestock housing were mass production, economic feasibility, technology, and media influence. Some notable responses included, "I know they're in cages because that law hasn't come to Ohio yet," "image A because B looks like how my grandparents would have done it," and "A, because I assume they're all inhumane."

The common themes that arose by those who selected traditional livestock housing as most abundant included, there are more small farms than large farms, participants had seen animals raised this way and know they are raised this way, and they had not seen farms like image A. Many participants referenced seeing images like image B while driving down the road. Unlike those who chose image A, only one person directly referenced the media as justification for choosing image B. It is important to note that some of the respondents commented on the aesthetic nature of the image by using words like "looks nice," "natural," "free/comfortable," and "happy." One respondent said "they look happy, outdoors, grassy 'happy cows come from California.'" While another participant said "cows on a hill equals America."

Of the 9% of participants who indicated that both images were prevalent in the state, most indicated that image A and image B were equally distributed. However, some chose both because of specie difference (i.e. chickens and pigs are housed like A, cows are housed like B). In addition, some respondent's suggested that neither picture was representative of livestock housing methods in the state, rather indicating that combinations of the methods were used and that the method depended on what season it was.

Although the majority of respondents thought Image A was most abundant in the state, the majority did not think it was humane. When asked what housing method was more humane, 322 (64.1%) participants selected traditional housing (figure B) as being more humane. A summary of these responses can be found in Table 2.

Table 2

Consumers' perceptions of most humane livestock housing method.

Image Selection	*f*	%
Image A	68	13.5
Image B	322	64.1
Both Images	111	22.1

Those who indicated traditional housing was more humane justified their responses with the common themes of, less crowded/not caged, natural setting, room to roam/free, and better physical and mental health. One participant referred to image B as a "natural setting and not crowded like prison." Additional responses included "they can breathe air not each other's smells, they can stretch, and live naturally." Some respondents referenced the livestock's health. One respondent chose image B because image A looked "like they are on life support." Two

notable references to the media were made. These references were, “looks like the ones in the commercials ‘happy cows,’” and “when you pack animals together we are shown in media they are less humane.”

Participants who indicated that both pictures showed humane treatment did so because the animals looked healthy and happy in both images, humane treatment is not indicated by the housing method but rather the operator, and neither picture showed inhumane treatment. Some quotes from these responses included, “nothing inhumane, each is better in its own way;” and “in image A people are caring for them, in image B they are out in nature.”

Those who selected image A referenced health and happiness, environmental control, people taking care of the animals, and the presence of technology as the reasons they chose the image. Responses that represented these themes include the following, “animals are protected from each other,” “production based on science and research,” and “environmentally controlled animals that are happy will produce more.”

The second objective was to determine if consumers think animals are healthier and more protected from disease in one housing method versus another. Of those responding, 242 (48.2%) participants selected image B. A summary of the responses in regards to what image showed the healthiest animals can be found in Table 3.

Table 3

Consumers’ perceptions of the image that showed the healthiest animals.

Image Selection	*f*	%
Image A	104	20.7
Image B	242	48.2
Both Images	153	30.5

Participants who selected image B justified their selection by saying the animals were happy, out in the open, in their natural green environment, and they have room to roam. Some examples of specific responses to this question included, “the animals actually have room to breathe and live comfortably,” “more control over their freedom,” “coloring better green and pretty,” and “reading and exposure to media says that animals that are separated are healthier.”

The respondents who chose both images indicated they chose both because the animals in both images looked healthy. Some specific responses include, look “comfortable, heads up, and ears are perky,” “nobody looks sick, underweight, or without hair,” and “cannot see any ribs, lost feathers, or rotten flesh.” Additionally, a few respondents justified selecting both images through comparison. For example, one participant said “in image B they are less likely to spread disease, in image A there are preventative measures, it’s controlled.” Lastly, a small number of participants selected both images while stating that they could not chose one image over another because an assessment of health could not be established through a picture.

Of the 30.5% of individuals who selected image A as showing the healthiest animals, a couple of common themes were present. One reoccurring theme was that the environment is controlled, clean, and sanitary. Additionally, respondents also referenced image A as having the healthiest animals because they were being closely monitored and cared for. Lastly, some respondents indicated they chose image A because the animals in image B “look skinny,” “not very healthy,” and “sick.”

After assessing what image showed the healthiest animals, respondents were then asked in what image the animals would be most protected from disease? Of those responding, 230 (45.8%) participants selected image A, and 222 (44.2%) participants selected Image B. A complete summary of these responses can be seen in Table 4.

Table 4

Consumers' perceptions what image showed animals most protected from disease.

Image Selection	*f*	%
Image A	230	45.8
Image B	222	44.2
Both Images	38	7.6

Responses of individuals selecting image A fell into four common themes; these included, a controlled environment, close monitoring of animals, clean and sanitary conditions, and the prevalence of vaccination programs. Some notable responses for selecting of Image A include, "more controlled environment, but one bad apple could infect the rest" and "animals provided antibiotics and vaccines along with other medicines."

Of those respondents who chose image B, many did so because the animals were not confined or overcrowded. One respondent referenced image A as spreading disease more rapidly, "like kids in school." Other respondents referenced "natural habitat" and "freedom" as their reasons for selecting image B. One notable response related to media influence and stated, "after watching *Food Inc.* definitely B, A is slaughtered in dirty conditions."

Those who chose both images did so because protection from disease depends on other factors besides housing method, such as proper care. Other respondents justified selecting both images by making an argument for each image. For example, one respondent said in image A farmers are "very precautious, they shower in shower out" and in image B if farmers are "rotating pastures and doing it right the livestock won't have worms."

The final objective of this study was to evaluate consumers' perceptions of safe and wholesome food products and consumer friendly prices as related to livestock housing methods. When participants were asked what image would produce the safest and most wholesome food product, 224 (44.6%) participants selected image B. A summary of all the responses to this question can be found in Table 5.

Table 5

Consumers' perceptions of safe & wholesome food according to housing method.

Image Selection	*f*	%
Image A	165	32.9
Image B	224	44.6
Both Images	97	19.3

Those who selected image B gave several justifications. The common themes included, the animals were not confined and thus would have less disease, the animals were outside in a natural free range environment, fewer chemicals (hormones, antibiotics, steroids) were used while the animals were being raised, and the animals were happier and healthier. A specific response from a participant stated that "range animals have no chemicals pumped into them." Additionally, some specific responses relating to health and happiness included, "the healthier the animal the healthier the food" and "happy animals make happy meals." Some of the participants who selected image B referenced reading scientific studies indicating that free range was healthier. One participant stated, "the spin media puts on it tells us to want free range."

Image A was selected by respondents who reasoned that the animals were being taken care of, were in controlled environment receiving controlled nutrition, and appeared clean and in

good health. “Someone’s taking care of them and monitoring them,” said one respondent. In addition, another respondent concluded that the animals in image A were “more protected and not exposed to elements.”

Participants who chose “both images” provided justification that both images appeared to show healthy and safe animals, the safety of food could not be determined from the pictures, the safety and wholesomeness of food would depend on the management, and both methods are inspected and have laws to follow. One respondent indicated that it “doesn’t have to do with living conditions, just how animals are cared for.”

When the research participants were asked what picture would produce the most consumer friendly food prices, image A was selected by 352 (70.1%) of respondents. Table 6 shows a complete summary of these responses.

Table 6

Consumers’ perceptions of consumer friendly prices according to housing method.

Image Selection	*f*	*%*
Image A	352	70.1
Image B	102	20.3
Both Images	34	6.8

Image A was frequently selected as participants were able to identify that this housing method was cost efficient, involved mass production, was controlled, and required less labor and less land. Some examples of participants responses include, “assembly line, more efficient” and “if we go back to a pasture system we’ll increase the price of food by 5 fold.”Additionally, one participant stated “one guy can do a lot more; the animals are less labor intensive in this system.”

Participants chose image B for reasons such as less overhead costs, less disease, and cost justified by consumer values. Two statements included, “it’s natural you don’t have to spend money on machines and buildings” and “farmers don’t have to pay for grass.” In addition, another participant stated “people are looking for healthier foods, we are a sick nation because we have crap in our food,” while another reasoned that “if we’re going to eat animals it’s worth the price.”

The respondents who selected both for this question reasoned that they just thought it was both. Examples of responses were it is a “toss up,” there is “no wrong answer,” and “more likely A, but probably both.”

Discussion/Conclusions

Although this study is not generalizable past those who attended the Ohio State Fair and volunteered for this study, it still provides valuable data for agricultural communicators. Much can be gained in regards to the perceptions consumers have about livestock housing methods, the conclusions they draw from images, and how the images in media affect those perceptions. Due to the animal welfare issues occurring in Ohio at the time of this study, it is suspected that participants may have been more familiar with the research topics than they would have been if animal welfare had not been a current issue. However, Ohio’s Livestock Care Board ballot initiative had not been officially placed on the ballot or released to the public at the time of this study.

The results of the study show that more participants thought the majority of livestock are raised in conventional livestock housing. Although this is accurate, the concern becomes the 24.5% (n=123) of individuals who thought traditional housing is more abundant. Agricultural communicators should take note of the reference to the images consumers see driving down the

road as well as the images they see on television. The observations of this research support the theory of semiotics suggesting that visual images promote a cultural ideology (Blaney & Wolfe, 2004). This was suggested through the response "Cows on a hill equals America."

Results also show that consumers do not perceive the most abundant livestock housing method to be humane. The American Veterinary Medical Association (AVMA) indicates the best livestock housing environments include: "freedom of movement; expression of normal behaviors; protection from disease, injury, and predators; adequate food and water; and proper handling" (AVMA, 2008, para. 2). Neither traditional nor conventional livestock housing meets all of these requirements. Thus, there are pros and cons to each system; however, based on participants' responses it can be observed that consumers are lacking this information. On more than one occasion, respondents provided justification for their response by indicating the animals were happier in one image vs. another. Some of these responses referenced the "Happy cows come from California" commercial campaign. Although this is a positive advertisement in regards to agriculture, communicators should evaluate if commercials such as this are creating idealistic views about agriculture rather than showing reality.

Interesting results were shown with objective two as respondents thought traditional livestock housing produced the healthiest animals, but they also thought conventional housing was more adequate in protecting livestock from disease. Emotional responses were used in regards to healthier animals being produced in image B as participants referenced items such as natural, happy, free, and green. It can be concluded that emotional responses were given because participants felt more familiar with image B (Messaris & Moariarty, 2005). When determining the animals most protected from disease participants referenced control, people taking care of the animals, and vaccination programs. Thus, it seems participants were less familiar with image A

as they did not develop emotional connections to the image. As related to semiotics, the participants' responses in this study illustrated they regularly see images of traditional livestock housing, thus they are able to relate cultural meanings to the image at the connotative level (Moriarty, 2005). Conventional livestock housing is not regularly seen by the average consumer and no cultural meaning is regularly associated with this image, thus one could conclude that this image was assessed at the denotative level (Moariary, 2005). By using this information, communicators could create advertising campaigns that would allow the consumer to make a positive cultural connection with conventional livestock housing as well.

The farm-to-plate knowledge gap seemed to be observed in the participants responses when asked what method produced the most safe and wholesome food. Most respondents selected traditional housing with the common reasoning that various chemicals were not used in traditional livestock housing. Thus, one may conclude that participants are not aware that pasture raised animals may also receive supplement feeding besides grass. In addition, it is not apparent that the participants considered that pesticides may be present in the grass pasture-raised animals consume. Also, the results illustrated that some participants assumed hormones, antibiotics, and steroids were only used in conventional housing methods, although in reality they may be used in both. One could attribute this apparent misunderstanding to mass media influence or a lack of motivation, (Tichenor et al., 1970; Weenig & Midden, 1997). Participants may have also assumed that image B represents organic farming.

The assumption of organic farming is more apparent in responses to the question concerning what image would produce the most consumer-friendly prices, as some respondents mentioned that organic food was more expensive. The majority of respondents correctly understood that conventional housing produced more consumer-friendly prices. However, an

important observation from these responses is that many of those respondents who answered image B did so not because they thought it was cheaper but because they were willing to pay extra for such products.

Agricultural communicators should use this information to produce effective advertising campaigns for agriculture as well as to effectively educate consumers about agriculture, specifically livestock production, in order to narrow the farm-to-plate knowledge gap. The findings show that respondents were somewhat knowledgeable about agriculture, but the perceptions and justifications provided were not always accurate. In addition, it provides valuable information about what consumers are interpreting through agricultural images.

The results of this study are not generalizable beyond those who participated in this study and provided useable responses. Additionally, the location and incentive used in this study may have biased this research and discouraged those who do not support the consumption of animal-based products from participating. Participants may have been influenced by the volunteer nature of the participants, individuals in the building, the survey administrators, other participants, or the exhibits in the building. Further analysis should be conducted on this data to evaluate if the demographics of the participants are related to their responses. This study should be replicated at a different venue and through random sampling in order to get a wider selection of the population. Further replication should also include sampling in a rural venue as well as an urban venue. A chi-square analysis of these geographical samples and image responses would provide valuable results in regards to the relationship between geographical region and knowledge and perceptions of agriculture, thus indicating if the farm-to-plate knowledge gap is widespread.

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Evaluating the Usability of the Texas Agricultural Research Database Website

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Evaluating the Usability of the [state] Agricultural Research Database Website

Abstract

The usability of website databases has gained attention in recent years since many users consider website databases difficult to use for complex searches. One website database is the [state] Agricultural Research Database, which serves to enhance communications about agricultural research in [state] from research facilities to interested members of research institutions, private industry, and the general public. Since its inception in 2002, the database website has emerged as a frequently referenced resource for agricultural information. Even though individuals search the database website for agricultural information, no research has determined whether the database website is usable. Therefore, the purpose of this study was to evaluate the effectiveness, efficiency, and satisfaction with which users interacted with the [state] Agricultural Research Database. Researchers identified five graduate students who are studying agricultural education and communications as representative users of the database website. These users talked out-loud while they completed five tasks on the database website. A facilitator explained the testing procedures and kept the users on track throughout the test without leading them to certain answers. An observer watched the users through captured video and recorded their task success, their time spent on each task, and their errors using Morae usability testing software. This usability testing process revealed issues that hindered or prevented users from completing tasks. The data collected in this study will help the site's designers fix navigational and design problems that became evident during usability testing.

Keywords: usability testing, usability, agricultural databases, uses and gratifications, website design, website navigation, Internet research

Introduction

People are demanding readily available information through advanced technology. In today's society, people choose to retrieve this information most often from the Internet. The assumption is that these people find what they are looking for on the Internet (Nielsen & Loranger, 2006).

It is crucial for agricultural organizations to communicate information through a strong, effective Web presence (Rhoades, Chodil, & Irani, 2007). The [state] Department of Agriculture is one such organization that sponsors the [state] Agricultural Research Database website to enhance communication about agricultural research conducted in the state. This database contains studies submitted by researchers to be shared with interested members of other research institutions, private industry, and the general public. Since its inception in January 2002, the database has emerged as a frequently referenced resource for technical agricultural information and currently includes more than 2,000 projects.

Organizations need not only to provide readily available information but also to consider usability. Researchers (Esrock & Leichty, 1999) are encouraging communicators to consider their users when developing visually pleasing and navigable websites. Usability testing is becoming increasingly important as the use of the Internet increases.

Usability

Usability refers to how well users interact with products, such as websites, software applications, mobile technologies, or other user-operated devices. Usability is measured by a combination of characteristics: effectiveness, learnability, efficiency, memorability, error frequency and severity, and satisfaction. Effectiveness concerns a user's ability to successfully use a product and accomplish tasks (Usability.gov, n.d.). Learnability determines how fast users

who have never seen a product before learn it well enough to complete tasks. Once users have learned to use a product, efficiency measures how fast users can accomplish the tasks. For users who have previously worked with a product, memorability measures how well they remember to use the product effectively. Error frequency refers to the number of mistakes users make while using a product, how severe are the errors, and how the users recover from the errors. Satisfaction concerns how much the users like using the product. In summary, usability "refers to how quickly people can learn to use something, how efficient they are while using it, how memorable it is, how error-prone it is, and how much users like using it" (Nielsen & Loranger, 2006, p. xvi).

The initial purpose of a website is lost when users simply stop using the website because of usability problems and look somewhere else for the information they need. Organizations that do not conduct usability testing on their websites lose the opportunity for feedback from users who move on to different sites (Cato, 2001). "If you want a great site, you have to test" (Krug, 2006, p. 141).

The usability of website databases has gained attention in recent years, as they are often viewed as being difficult to use (Halevy, 2009). While simple keyword searches offer great usability, database users want more than keyword searches can offer. Users want more complete results, only relevant information returned from their query, and more structure in the results returned. Because of users' differing expectations of databases as opposed to simple web searches, the need for database usability studies is increasing (Jagadish et al., 2007).

Disciplines in medicine, biology, and agriculture have acknowledged the importance of usability testing for evaluating the effectiveness of and user satisfaction with their online research databases. Usability testing improved the search ability and navigation of the Database

of International Rehabilitation Research, a subscription-free bibliographic database of references to published reports of rehabilitation research conducted outside of the United States (Munger, 2003). The Center for International Rehabilitation Research Information and Exchange (CIRRIE) at the University at Buffalo developed and maintained this database, which stored more than 17,000 citations searchable through several fields: subject headings, author, title, research area, geographic area, language, and year of publication. For usability testing, the study involved 10 rehabilitation researchers who were real users of the database. Users were asked to think aloud during the tasks so that the facilitator could record their actions and comments. During testing, these users were asked to complete tasks that involved searching for an author, a title, and a subject; verifying a citation; using multiple fields and links; broadening a search; narrowing a search; using Boolean operators during a search; and viewing all records from a search at once. Users easily completed the tasks involving the author search, title search, citation verification, and the use of multiple fields. Other tasks were more challenging for users to complete: the use of links, the ability to view all records at once, and the ability to broaden or narrow a search. Almost all users had difficulty with the subject search and the search using Boolean operators. Usability testing helped the CIRRIE staff develop a more detailed introduction to the database and provide a thesaurus listing every major word from the subject headings to assist users with the subject heading search option (Munger).

Biologists and computer scientists collaborated on the design of a database of zebrafish developmental and genetic research information accessible through the Internet (Westerfield, Doerry, Kirkpatrick, Driever, & Douglas, 1997). Although the Internet provided zebrafish scientists with better access to research information, it was unclear if the site met the need of users wanting useful, accurate, and up-to-date information without having to learn a complex

interface. Usability testing helped design a prototype of the database on the Internet that was tested with zebrafish scientists. Usability researchers videotaped and analyzed the scientists using typical data submission and search tasks to determine the amount of time required to complete different searches, the errors encountered while completing tasks, and the problems with the database interface. One result of the usability testing was a simple database layout with a limited number of search criteria focusing on people, publication, mutants, map markers, and images (Doerry, Douglas, Kirkpatrick, & Westerfield, 1997). Observation of the zebrafish scientists using the database revealed the need to provide instantaneous feedback to inexperienced users when submitting or updating experimental data to the database.

Usability testing has improved the search ability and navigation of agricultural websites and research databases. Researchers, producers, and those interested in sorghum production have a need for credible, accurate, and up-to-date research information for the sorghum industry. The Texas Tech Sorghum Research Initiative (TTSRI) website was created in response to this need. The website provides current and archived research, sorghum news, and links to other sites. Agricultural communications researchers conducted usability testing to measure the efficiency, error, learnability, and satisfaction of representative and non-representative user groups for the TTSRI website (Dunn, Akers, Meyers, Chambers, Bobbitt, 2010). The researchers chose graduate students in plant and soil science to serve as a representative group since they were familiar with agriculture and had knowledge of research. Undergraduate students in mass communications were placed into a non-representative user group. Users in both groups were asked to think aloud while completing seven tasks that related to the website's navigational scheme, layout, and content. By evaluating the number of mouse clicks and the average time spent on task, researchers concluded that the representative users were more efficient at using the

website to complete tasks. Users from both groups encountered problems with the search function on the TTSRI website. The search box is labeled "Sorghum Research Database" and allowed users to search the database from any page on the TTSRI site; however, users tried to complete their tasks by using the search box. Representative users said that the TTSRI website was easy to learn, that they learned the site quickly, and that they felt confident in using the TTSRI website. The researchers suggested the website add a search function that browses the entire site and not just the Sorghum Research Database (Dunn, et al.).

Uses and Gratifications Theory

The theoretical framework for this study relies on the uses and gratifications theory. This theory originally applied to newspapers, radio, and television but has expanded to include computer-mediated communication channels, particularly the Internet (Lee, 2004). Uses and gratifications theory attempts to explain how users select communication channels to satisfy their needs, to discover users' motives for using those communication channels, and to identify the consequences of using these communication channels (University of Twente, 2004). This theory assumes that individuals actively find and use the communication medium that best fulfills their needs (Baran & Davis, 2003). In terms of the Internet, users seek out well-organized information from efficiently designed websites (Eighmey & McCord, 1998).

Uses and gratifications theory relates to usability because users will stop using a website that is not usable and will look for other communication channels that provide the needed information (Nielsen, 2000). In Luo's (2002) application of the uses and gratifications theory, users' attitudes toward the Web further dictated their Web usage and satisfaction. If users' hold positive attitudes toward the Web, they will have a higher satisfaction level and will use the Web more often. Informativeness is a factor that relates users' attitudes toward the Web to their Web

usage and satisfaction. Users who find a website informative have more positive attitudes—leading to more Web usage and satisfaction.

Purpose and Objectives

The *National Research Agenda for Agricultural Education and Communication* (Osborne, n.d.) recognizes the need for analyzing and strengthening the effectiveness of content in communicating local, national, and international agricultural information. Therefore, the purpose of this study was to evaluate the usability of the [state] Agricultural Research Database website in regards to effectiveness, efficiency, and satisfaction. The data collected in this study would help the site's designers fix navigational and design problems that became evident during usability testing. The following objectives were investigated throughout the course of this study:

1. To describe the demographic characteristics of users.
2. To determine the effectiveness of the [state] Agricultural Research Database website.
3. To determine the efficiency of the [state] Agricultural Research Database website.
4. To determine users' satisfaction with the [state] Agricultural Research Database website.

Method

Prior to usability testing, researchers determined five tasks that employ different search options in the database website. Based on the researchers' use of the database, a time limit was set for completing each task. The number of users for usability testing can range from large sample sizes to as few as one user (Rubin & Chisnell, 2008). For this usability study, researchers conducted a pilot test with one user and actual testing with five users. Nielsen and Loranger (2006) recommend five users for each round of testing. Furthermore, Lazar (2006) also noted that usability testing with five users was better than no testing.

Usability testing occurred in two different rooms—an observation room and a recording room where the test was conducted. The observation room was equipped with Morae Observer and Morae Manager usability software, which allowed one observer to mark the task start and stop times, task success, errors, and quotations while watching the users' actions and listening to their comments through captured video. This observer also administered the pre-test survey, System Usability Scale survey, and post-test survey. A web camera and microphone were set up in the recording room to capture users' actions and comments while performing the five tasks.

A facilitator accompanied the users into the recording room to assist with testing procedures. The role of the facilitator was to explain the study, keep users on topic, provide answers should users' questions meet the pre-determined criteria of what can be answered, and explain the pre-test and post-test questionnaires. The facilitator asked users to use think-aloud protocol—talking aloud to reveal users' thoughts related to the database as they performed the tasks. This method allowed users to say why they hovered over a link or clicked on a search result. The facilitator was to speak as little as possible, only using short affirmative phrases like "OK" and "Uh-huh." The facilitator watched the users speak through the completion of the tasks and prompted them for more information ("Please keep talking.") whenever they stopped talking for more than 20 seconds. If a user asked a question, the facilitator gave a neutral response ("What do you think?"). This practice prevented the facilitator from influencing the users' comments or actions.

The pre-test survey gathered demographic information, such as age, gender, and level of education. This survey gathered information about users' Internet use in relation to how much time per day they spent on the Internet, how often they visited sites to look up general

agricultural information, if they have used a scholarly database to look up agricultural information, and if they have visited the [state] Agricultural Research Database website. The following tasks were used in the pilot and actual testing to gauge the users' experiences in using the database:

Task 1: Find information written by Conrad Lyford.

Task 2: Search for a specific project title.

Task 3: Find a scholarly publication.

Task 4: Find projects on water conservation.

Task 5: Find two projects from Texas A&M University in College Station.

The System Usability Scale (SUS) was administered after each user had completed the tasks. The SUS is a survey composed of 10 statements used to determine a user's satisfaction with using the database. The result of the survey is a single score ranging from 0 to 100. Similar to the letter grade scale given at most universities, a database with a score of 70 and above is acceptable. After the SUS, users completed the post-test survey, which consisted of open-ended questions related to the users' thoughts on the database's search topics, search ability, and layout of the database. Users also described their overall experience with using the database website.

In usability testing, data collection can include a mixed-methods approach (Nielsen, 2006). Data collected for this study included demographics, direct quotes from the users, frequency and severity of errors, time spent on each task, open-ended responses to the post-test questions, and System Usability Scale (SUS) survey answers and ratings.

As a means to prevent researcher-bias, a pair of researchers evaluated each video using Morae Manager after all testing was complete. The two researchers used the Dumas-Redish Scale (1999) to classify the severity of usability errors found with each task: 4 = creates a subtle

problem; 3 = has a minor effect on usability; 2 = creates a significant delay and frustration; and 1 = prevents the completion of a task. The Dumas-Redish Scale was selected prior to usability testing, but the two researchers discussed how they thought each usability error should be rated during data analysis. Each error was discussed until the researchers reached a 100% consensus.

Results

Objective 1: To describe the demographic characteristics of users.

Five graduate students who are pursuing degrees in agricultural education or agricultural communications served as the users. Four of the users were female, and one user was male. The majority of users (n = 4) were pursuing master's degrees, while one user was working toward a doctorate degree. Their ages ranged from 21 years to 28 years, with an average age of 24.6 years.

Users reported the hours per day they spent on the Internet. One user spent two hours per day, two users spent four hours per day, one user spent six hours per day, and one user spent eight hours per day. Table 1 illustrates how often users searched for agricultural information on the Internet. One user reported every six months, two users reported weekly, and two users reported daily. All of the users had searched a scholarly database to find agricultural information. One user searched scholarly databases every six months, while one user searched scholarly databases every couple of months, and three users used scholarly databases every week. All of the users had never visited the [state] Agricultural Research Database website.

Table 1

Use of Internet and Scholarly Databases for Looking Up General Agricultural Information (N = 5)

Characteristic	*f*	*f%*
How often do you visit sites looking up general agricultural info?		
Never	0	0%
Once a year	0	0%
Every six months	1	20%
Every couple of months	0	0%
Once a month	0	0%
Weekly	2	40%
Daily	2	40%
How often do you use a scholarly database?		
Never	0	0%
Once a year	0	0%
Every six months	1	20%
Every couple of months	1	20%
Once a month	1	20%
Weekly	2	40%
Daily	0	0%

Objective 2: To determine the effectiveness of the [state] Agricultural Research Database website.

In order to determine the effectiveness of the database website, task success and the number of errors were recorded. Task success showed the percentage of users who completed each task correctly within the pre-determined time limit (see Table 2). Twenty percent of users (*n* = 1) completed task 1 by finding the author Conrad Lyford within a time limit of seven minutes. One user failed to complete the task when the author's last name was misspelled in the search box of the database. Four users correctly typed the author's name as keywords in the search box of the database; however, three of these users encountered errors with the database search returning a blank, white page with no results.

User 3: Whenever you click on search, it takes you to a blank, white screen. The search does not seem to be working.

Results for task 2 indicated 40% of users found the title of a specific project. The two users who found the project title used the link to browse for project titles. Other users typed "Texans' Perceptions" or "mass media" as keywords in the database search box and narrowed the search to match the exact phrase. Both keyword searches returned a blank, white screen with no results. For task 3, all five users found a project related to student recruitment to an agriculture or food science major by using the link to browse for project titles, the research problem area, or the database search with "recruiting" as the keyword.

User 1: I think I would go to research problem area to find this task. I definitely don't want to search the database. It takes too long, or it comes up with an error.

Results for task 4 indicated 80% of users found projects categorized under water conservation, Users 1 and 3 found water conservation projects by using the link to browse knowledge areas, particularly natural resources and environment. User 2 found a project by using the link to browse for project titles starting with the word "water." User 5 used the keywords "water conservation" in the database search box. The final task resulted in 60% of users finding two projects from Texas A&M University in College Station within the time limit. Those users who successfully completed task 5 used the link to browse for research institutions.

Table 2

Task Success

Task	%
Task 1: Find information written by Conrad Lyford in 7 minutes.	20
Task 2: Search for a specific project title in 7 minutes.	40
Task 3: Find a scholarly publication in 6 minutes.	100
Task 4: Find projects on water conservation in 6 minutes.	80
Task 5: Find two projects from Texas A&M University in College Station in 8 minutes.	60

The second way to measure effectiveness was to count the errors made during usability testing. Researchers differentiated between the errors of the database website itself and the errors of the users navigating the database website. Both types of errors can affect the usability of the site. For the purpose of this study, errors represented the mistakes a user made while completing the five tasks. Errors were coded using the Dumas-Redish scale ranging from four to one (1999). A score of four indicated a subtle problem with completing the task. For example, errors scored as a four included clicking the search button on the database multiple times while its searching for results, clicking the refresh button while the database results were loading, clicking the back button while the database results were loading, or clicking the database homepage bar while database results were loading. These subtle problems did not prevent users from completing a task within the pre-defined time limit. A score of three signified a minor effect on usability. Errors scored as a three were using a different search option or new keywords when a user's initial keywords returned no results or clicking on multiple search options (institutions, title of project or search database) without waiting for one of these options to load. An error that created delay or frustration during a task received a score of two. No errors of this type were observed in this study. The most severe score of one was an error that prevented completion of a task. A task

was scored as a one when a user exceeded the time limit for completing a task or the user selected a navigational path that prevented them from completing a task. For example, a user who selected the submit research option on the database website rather than the search database option would fail to complete a task. The coding scale was decided upon prior to the testing, and the researchers discussed how they thought each type of error should be rated after usability testing was completed. The tasks were coded during data analysis by the researchers who used Morae Manager software to assign the error rate.

Task 1, finding Conrad Lyford as an author, resulted in the highest number of incomplete tasks (see Figure 1). Four users did not complete this task within the set time limit. The incompletions came from users who misspelled the author's name or selected the submit research link rather than the search database link. More than half (60%, $n = 3$) of the users did not complete task 2 within the allowed time. This task asked users to find the following project title: "Texans' Perceptions about Agricultural and Biotechnology Issues Reported in the Mass Media." On several occasions throughout task 2, users could not complete the task on time because the search did not function correctly. All five users were able to complete task 3 within the time limit, encountering no fatal errors. During task 4, one user demonstrated impatient behavior by continuously clicking on the refresh button or the back button while the database was loading results from the search. These impatient behaviors prevented the user from accessing the search results within the permitted time limit. Two users encountered either a "connection was reset" message or a blank, white screen for a browser window during task 5. The message and blank screen occurred after users clicked on the browse by institution button in the database.

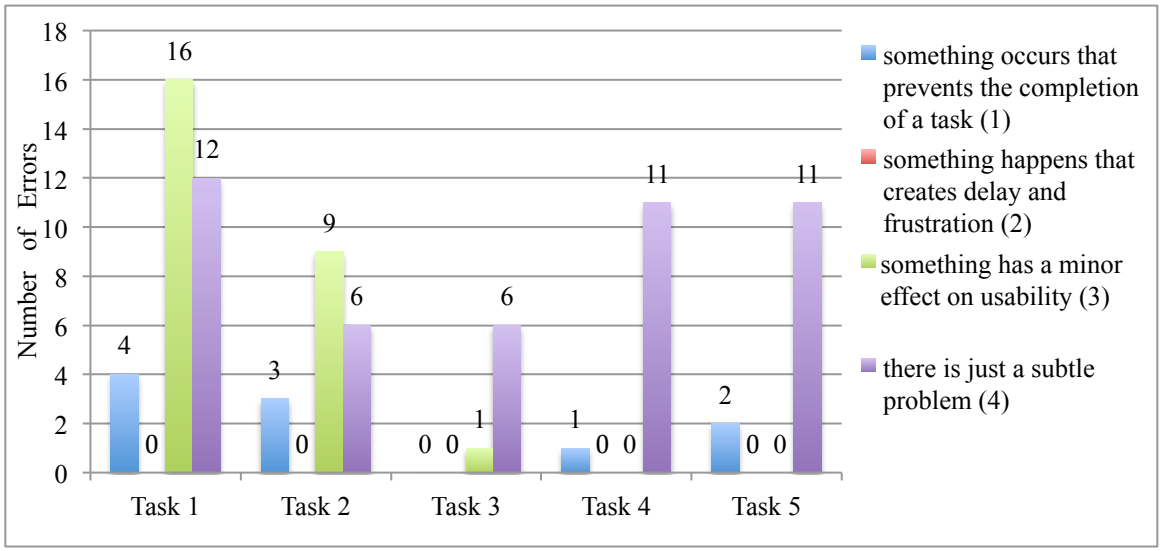

Figure 1. Number of Times Errors Occurred Per Task

Objective 3. To determine the efficiency of the [state] Agricultural Research Database website.

The time users spent working on each task was recorded to determine the efficiency of the database website. All five users experienced long delays while the database searched keywords.

User 1: At this point, I probably would have gone to something like Google and search for the article title.

User 3: By this point, I would be very frustrated and would not have continued to use this. I would have gone to Google Scholar.

User 5: The speed in which items load is very frustrating.

In task 1, users spent an average of 6.85 minutes finding Conrad Lyford as an author. For task 2, users found the project title "Texans' Perceptions about Agricultural and Biotechnology Issues Reported in the Mass Media" within an average time of 6.94 minutes. As the third task, finding a project about recruiting students to an agriculture or food science major took users 5.83 minutes to complete. Users completed task 4 in an average of 5.88 minutes by finding projects

categorized as water conservation. As the last task, the average time for users to find two projects from Texas A & M University was 5.03 minutes.

Objective 4. To determine users' satisfaction rate of the [state] Agricultural Research Database website.

After completing all five tasks, each user completed the System Usability Scale (SUS), which measured users' satisfaction during their interaction with the [state] Agricultural Research Database website. SUS is composed of 10 statements measured on a 5-point Likert scale that ranged from strongly disagree to strongly agree (Brooke, 1996). The score for items 1, 3, 5, 7, and 9 was the scale position minus 1. For items 2, 4, 6, 8, and 10, the score was 5 minus the scale position. Multiply the sum of the item scores by 2.5 to obtain the single, overall SUS score. The score ranged from 0 (*very little satisfaction*) to 100 (*very high satisfaction*), where a score of 70 or higher indicated good usability. The overall satisfaction score for the [state] Agricultural Research Database website ranged from 45 to 65, with an average score of 53.5. The low SUS score seemed to match the users' comments on their overall experience with the database.

User 1: Based on my experience today, I do not think this is a website I would use as of right now to research things. It was slow and tedious to find even very simple things.

User 5: If I was trying to find information from this [database] website, I would have given up at the end of the second or third task.

As seen in Table 3, the majority of users (60%, $n = 3$) disagreed that they could learn to use the database website quickly. More than half of the users (60%, $n = 3$) agreed that the system is cumbersome.

User 4: I really did not like the front page because I had to click on "search database." This should have been on the front page. Also, I have to click too much to get to where I want to go."

Three users (60%) agreed that they were very confident in using the database website. All five users indicated disagreement that they would need to learn a lot before using the database website.

Table 3

System Usability Scale (SUS) Scores by User (N = 5)

	User 1	User 2	User 3	User 4	User 5
Would use frequently	2	3	3	3	1
System unnecessarily complex	3	3	2	4	1
System easy to use	3	4	1	1	3
Need technical support	4	2	1	1	2
Functions well integrated	3	4	3	1	3
Too much inconsistency	4	2	3	1	1
Learn to use quickly	4	2	5	2	2
System is cumbersome	5	3	3	5	4
Very confident using system	4	1	4	4	2
Need to learn a lot before using	2	2	1	1	1
Overall SUS Score	**45**	**55**	**65**	**47.50**	**55**

Discussion/Conclusions

The users involved in this usability testing of the [state] Agricultural Research Database were representative of typical users for the website. The users were graduate students who spent time on the Internet each day, searched for agricultural information frequently, and had experience using scholarly databases. None of the users had ever visited the [state] Agricultural Research Database before.

The results of the usability testing indicated a number of issues that impacted the usability of the site. Only one task was accomplished by all five users; while, the other tasks were not completed successfully by all the users. The users would often click on inappropriate links to try to complete the task, while typing errors prevented other users from finishing. The database website also displayed a number of errors that hindered or prevented users from

accomplishing the tasks. This included taking a long time to load a page or bringing up a blank, white screen indicating failure to load the page. Users voiced their dislike and impatience with the overall speed of the website. Although users who were able to accomplish their tasks did so within the predetermined time allotted, they still expressed their displeasure with how slow the site was working.

The results of the System Usability Scale (SUS) aligned with the verbalized and written feedback regarding the database website. With an average SUS score of 53.5, the overall satisfaction for the site fell well below the score needed (70) to indicate good usability. A few users said the database website is a good idea, but that due to how slow the site worked, they would rather use other websites, specifically Google, to search for research.

Inefficient tasks, errors, and low satisfaction when searching the database website could impact its future use. When users are less efficient in completing tasks, they may feel less satisfied with the database. Users who express frustration or irritation while completing tasks through the database website can form negative attitudes toward the product. These attitudes can influence further usage and user satisfaction. The uses and gratifications theory relates to these usability concerns because users will continue to use the database website as long as it fulfills their needs. If users determine the database website is no longer usable, they may choose to find another source for the information they need.

Testing of the [state] Agricultural Research Database website indicated a number of areas that need to be improved on the site. The first, and most important, is to address the slow loading time for the pages on the site. Within just a few seconds of waiting, users would often begin clicking on other links or continuously click on the same link. This impatience would sometimes lead to errors that would not have occurred if the site had been operating at a faster speed.

The other item that needs to be clarified on the site is the actual purpose of the site. The database is not a warehouse for research publications. Instead, it is a repository of studies funded by the [state] Department of Agriculture or other projects conducted in [state] that relate to agriculture. The database does not have the ability to house full research articles, and this limitation needs to be made clear on the homepage.

Another item to address is the search database function. The available options in the drop-down boxes were sometimes confusing to users, especially the difference between "research project title" and "research project publication." The other point of confusion was using the term "investigator name" instead of "researcher name."

This usability testing process discovered a number of areas that would greatly improve the usability of the [state] Agricultural Research Database. The users' comments and suggestions will be used to make several changes to the database website that will further improve it and make it a valuable resource for agricultural research information.

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Learning in a new land: Second Life in agriculture

Category: Research Paper

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Abstract

Because of the increasing need to actively engage students and provide them with a quality education, educators are looking at integrating new technologies into the traditional classroom setting as well as distance education programs. Therefore, Second Life, a 3D virtual world developed by Linden Lab in 2003 (Linden Research, 2009a), has become a possible way to promote student engagement in both a traditional classroom and distance education program. Because of the limited amount of research on SL, the authors used an integrative literature review to establish a basis for further research in the topic area. This study focused on reviewing current literature on SL, critiquing SL as an educational tool, and synthesizing agriculture's presence in SL. New technologies have not only impacted the way we communicate but also the way today's college students participate in the classroom. By incorporating SL into the traditional classroom, educators can provide students with the opportunity to participate in real-world simulations that would otherwise not be feasible, use technical skills they learned in class, and interact with their classmates using asynchronous and synchronous communication. The authors conclude that agriculture is slow to adopt virtual education such as SL as an educational tool and more research needs to be done on using and integrating new technologies in the agriculture classroom.

Keywords: Second Life, technology-enhanced education, Second Life in education, Second Life in agriculture, Second Life as an educational tool, integrative literature review.

Learning in a new land: Second Life in agriculture

Introduction/Purpose

In 2005, the Association of American Colleges and Universities (AAC&U) and its more than 1,100 cooperating institutions began an initiative, *Liberal Education and America's Promise*, to help college students gain a higher quality education (Association of American Colleges and Universities, 2007). It is the goal of an institution of higher learning to provide students with a quality education at an affordable price, but, furthermore, it is the obligation of the institution to provide students with the knowledge they need to perform well and succeed in a competitive world (AAC&U, 2007). Therefore, AAC&U (2007) identified "essential learning outcomes" (p. 3): "knowledge of human cultures and the physical and natural world"; "intellectual and practical skills, including inquiry and analysis, critical and creative thinking, [and] written and oral communication…"; "personal and social responsibility, including civic knowledge and engagement—local and global [and] intercultural knowledge and competence…"; and "integrative learning, including synthesis and advanced accomplishments across general and specialized studies" (p. 3). Consequently, educators are left to bridge the gap between providing students the content of a specific course while giving them a quality education and providing them a foundation for success (Jacobson, Militello, & Baveye, 2008; AAC&U, 2007). For some educators, Second Life (SL), a 3-D, virtual world (Linden Research, 2009a), is the educational tool they have used to bridge the gap (Bowers, Ragas, & Neely, 2009; Bloomfield, 2007; Johnson, 2006).

The debut of another world

SL, developed by Linden Lab, debuted in 2003 (Linden Research, 2009a). Now more than 18 million users across the world have joined the online community, which includes individuals, learning institutions, governments, and profit and nonprofit organizations (Linden

Research, 2009a; Kumar et al., 2008). In 2008, SL covered 65,000 acres (Hargis, 2008), and now, if the world were real, its land space would occupy that of Houston, Texas (Linden Research, 2009a). "Simply stated, SL is the most flexible, richest and advanced virtual world that exists today," (Linden Research, 2009a, para. 2). As SL becomes more education friendly, it may also become a more widely used teaching tool (Atkinson, 2008). "Education is a large part of SL, so large in fact that Linden Labs has dedicated staff members whose focus is on how SL can be used for RL [Real Life] education" (Baldwin, 2009, p. 32).

Each SL user creates an avatar, the online representation of the user behind the computer. The avatar, which will move and gesture similar to a human, can be designed and manipulated to the users' preferences. Additionally, some users take on new identities and participate in activities beyond what they would do in real life (Baldwin, 2009; Nicholson & Duranske, 2009; Atkinson, 2008; Hargis, 2008; Anderson, 2007; Bloomfield, 2007; R. Martinez, 2007; Hemp, 2006; Johnson, 2006).

While in SL, users can communicate with others in multiple forms and transform their avatars into an extravagant characters by using the multitudes of clothing designs and body styles available to users (Atkinson, 2008; Hemp, 2006; Yellowlees & Cook, 2006), take part in virtual events, and build their own social networks and islands all in another life online (Baldwin, 2009; Hemp, 2006). SL gives users the opportunity to use their creative minds and critical thinking skills as they build a virtual environment and be a part of their second life (Baldwin, 2009; Foster, 2007). Therefore, SL becomes not only a place to make new friends but also a market place where users can buy, build, and create their own property (Linden Research, 2009a; Atkinson, 2008; Kumar et al., 2008; Bloomfield, 2007; Pence, 2007-2008; Hemp, 2006; Johnson, 2006; Yellowlees & Cook, 2006). Buying and selling is a way of life in SL, where

more than $5 million dollars in legal tender is exchanged in the virtual world via Linden Dollars—the SL currency (Baldwin, 2009; Hemp, 2006).

Online social networking and the continuous need for instant feedback have, in a unique way, shaped and changed the way educators communicate with and teach today's college generation (Walker, 2009a; Rhoades, Friedel, & Irani, 2008; R. Martinez, 2007). Educators are forced to communicate on the same level as students through the use of various types of social or new media (R. Martinez, 2007). According to Jarmon, Traphagan, Traphagan, and Eaton, SL "contributes to the facilitation of life-long learning that extends beyond the confines of the classroom"; "has the potential to generate feelings of co-presence and connection among participants in and outside of virtual worlds"; and "provides a context for considering how new technologies have the potential to enrich the lives of older adults" (2009, p. 221). Therefore, SL gives users the chance to collaborate with others and share experiences through online engagement (Jarmon et al., 2009). Because of the flexibility, engagement, and collaboration opportunities of 3D virtual worlds, such as SL, educators see them as a way to further enhance the educational experience of on-campus and distance education students (Bowers, Ragas, & Neely, 2009; Jarmon et al., 2009; Bloomfield, 2007; Johnson, 2006).

More specifically, the authors of this study are interested in incorporating SL in agriculture to enhance the traditional college learning experience and increase hands-on learning and student engagement. The complexity of agriculture practices and mechanics can make teaching with case studies, etc. difficult; however, SL simulations can help bridge the gap between classroom and real world, hands-on experience. "We believe that by utilizing the affordances of the Second Life platform to create experiences that are infeasible or impossible in the real world, educators can create superior learning experiences to those which do not offer

virtual components" (Mason, 2007, p. 14). Furthermore, because of the limited amount of research on SL, the authors of this study chose to do an integrative literature review on SL in education (Torraco, 2005). To accomplish this, the authors identified the following objectives:

1. Review current literature on SL;
2. Critique SL as an educational tool; and
3. Synthesize agriculture's presence in SL.

Methods/Procedures

Because SL is relatively new and few studies have been done, the authors of this study chose an integrative literature review to establish a basis for further research in the topic area. An integrative literature review requires researchers to do an extensive search of the literature and explain the need for a literature review (Torraco, 2005). "The integrative literature review is a form of research that reviews, critiques, and synthesizes representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated" (Torraco, 2005, p. 356). According to Torraco (2005), researchers can use an integrative literature review to analyze and address fresh topics.

The authors of this integrative literature review used the following keywords to review the literature: Second Life, technology-enhanced education, Second Life in education, Second Life in agriculture, Second Life as an educational tool, and integrative literature review. Additionally, they searched Google Scholar, Texas A&M Library, Linden Research website, ProQuest database, and online journals to establish the literature review.

Results/Findings

Second Life in the college classroom

The mass amount of online social networking sites and desire for instant feedback have, without a doubt, impacted the way people communicate and interact with others around the world and, quite possibly, impacted and changed the way educators teach this generation of college students (Walker, 2009a; Rhoades , Friedel, & Irani, 2008; R. Martinez, 2007). An educator must communicate on the same level as the students, which includes various types of social or new media (R. Martinez, 2007). At first, SL may be perceived as a game; however, after a user becomes involved in the online community, the atmosphere becomes conducive to learning and virtual world simulations (Hargis, 2008). Because of the advantages and flexibility within SL, a user can find a variety of educational settings with online learning centers. More than 700 institutions around the world have already taken advantage of this environment (Linden Research, 2009a; Linden Research, 2009b). The massive response to and use of SL by higher education institutions confirms that the virtual world successfully combines "electronic communication with the quality of shared space" (EDUCAUSE, 2008, p. 2).

The implementation of SL in education has occurred successfully in numerous disciplines (Boulos, Hetherington, & Wheeler, 2007). Universities including Harvard, a SL educational pioneer (Zhang, 2007), and Stanford use SL to teach courses in campus buildings replicated in the virtual world (Baldwin, 2009; Atkinson, 2008; Hargis, 2008; Anderson, 2007; Bloomfield, 2007; Macedonia, 2007; Zhang, 2007; Johnson, 2006). Additionally, Elon University, in Elon, North Carolina, hosts a writing-intensive course in SL (Atkinson, 2008). Because SL is still a new technology, Linden Lab provides educational institutions with the opportunity to explore the virtual world with free land for a semester (Baldwin, 2009; Johnson, 2006). As well as using SL to enhance learning, universities have used it as a recruiting tool (Nicholson & Duranske, 2009).

Institutions are not alone using SL as an educational tool. Libraries, museums, and historical sites are recreating similar experiences for virtual world users (Atkinson, 2008; Anderson, 2007). "While virtual worlds are not new, development of teaching and learning within those environments may provide innovative opportunities to engage learners in highly social and interactive online experiences" (Atkinson, 2008, p. 17).

At the University of Michigan-Dearborn, the School of Management wanted to use SL to add to the experience of the traditional college classroom and connect students to information technology (Johnson, 2006). The School wanted something more than just another trend; they wanted something that would complement the students' education. "… it seems that SL gives students (and instructors) a hybrid version of on-campus and online learning tools" (Johnson, 2006, p. 1). According to Hargis (2008), SL is an enhancement to traditional curriculum; it gives students an opportunity to experience the coursework at another level. Baldwin (2009) hypothesized in a 2009 study that "…using a virtual world such as SL would enable my students to gain experience that might not otherwise have, giving them meaningful material about which to write and consequently improving student writing on both low and high-risk assignments" (p. 16). However, Murphy, Lindner, Kelsey, and Wingenbach (2005) wrote that, although new technologies have given students more variety and options when taking online classes, written communication may always be the chosen form because it has been the primary means of communication in the past.

To keep students active and engaged, educators must continue to look at using virtual worlds in the college classroom (R. Martinez, 2007). "Technology enhanced classroom students demonstrated statistically significant increases in student engagement and improved academic achievement" (Carle, Jaffe & Miller, 2008, p. 1). Likewise, SL makes it easy for instructors to

watch student participation because, when the student is not active on the computer and in the virtual world, his or her avatar will fall asleep (Nicholson & Duranske, 2009; L. Martinez, P. Martinez, & Warkentin, 2007). However, if students experience technical difficulties, they are disconnected from not only SL but also class discussion (L. Martinez et al., 2007).

Rhoades et al. (2008) found many students use blackboard and online learning technologies in the classroom and more common new media including Facebook in their personal lives; however, few students have yet to adopt such technologies as SL in their personal lives let alone their academic lives. Yet, today's students live in a world full of virtual environments; therefore, many of them are ready and willing to adopt new technologies and virtual worlds (Macedonia, 2007). Because students are using new technologies in their personal life, it is important that educators identify opportunities to incorporate such technologies in the classroom. However, because today's Internet is a widely used social network, some students may find it hard to view new technology as a way of learning and not just as a means of social communication (Rhoades et al., 2008).

By using new technologies in the classroom, institutions can prepare students for career areas where they are required to use new technology and attract students who are looking for a program using cutting-edge technology (Walker, 2009a; Rhoades et al., 2008). Baldwin (2009) claimed that SL is a legitimate educational tool: "It is my responsibility, as an instructor, to tap into these different modes of literacy and learn to meet the students where they are comfortable in order to challenge them to go beyond their comfort zone" (p. 35).

Jacobson et al. (2008) explained the process Cornell University, the University of Maryland, the University of Tennessee, and Utah State University "used to create a VFT [virtual field trip] that incorporates exploration, interactivity, and a variety of learning processes" (p. 2).

The VFT designers created a web-based, 3D environment using a variety of media including maps, photos, video, etc. Although a VFT does not give students the hands-on experience they would gain if they physically visited the site and explored the culture and environment, it does give them the opportunity to learn through different types of media within a virtual world and visualize what it would be like to visit the location (Jacobson et al., 2008). VFTs provide a comfortable atmosphere for students to interact with each other while learning through a 3-D educational exercise (EDUCAUSE, 2008).

Additionally, Jacobson et al. (2008) explained that the VFT was not designed to teach the basics of the course but rather add an additional structure that helped the students understand issues related to soils and development. The 3-D environment had museums and agriculture interest areas for students to visit and gain more insight into Mexican culture and its contribution to both traditional and nontraditional agriculture. Likewise, students could stop at the library to pick up information about Mexico's history. Students were encouraged to picture themselves in Mexico and experience it as if they had taken a field trip to the country (Jacobson et al., 2008).

Students can sit in a classroom and learn about a particular subject, but it is when they begin to immerse themselves into a simulation they become familiar with the experience and begin to truly understand it (Weusijana, Svihla, Gawel, & Bransford, 2007). Additionally, writing reflection journals on their experience with the simulation should further enhance their understanding. "Multi-User Virtual Environments such as Second Life should make it possible for students to experience events first-hand rather than simply learn about them secondarily" (Weusijana et al., 2007, p. 34). However, L. Martinez et al. (2007) followed up with the students and instructors in a study at a Mexico university and found that students were satisfied with their course being taught in SL, but thought SL was slower than the traditional classroom.

Atkinson (2008) said, at first, SL can be overwhelming. “I just didn’t get it. In fact, my students didn’t get it either” (p. 17). Some educators say SL is “where anything goes” (Atkinson, 2008, p. 18). Baldwin (2009) compared it to visiting a foreign country because of all the things to learn about the culture of SL; however, most new technologies have experienced the same type of judgment (Atkinson, 2008). Still, the use of SL as an education tool may depend upon how the educators adopt the technologies and not on the new technologies (Atkinson, 2008).

A 2008 New Media Consortium Survey of Educators in Second Life reported that more than 70% of the 358 respondents are now using SL in the classroom, which is up from 54% in 2007 (Levine, 2008). Additionally, 12% reported that they have taught a class fully in SL, which was also up from 2007. Furthermore, educators reported being more familiar and experienced with SL than they were in 2007, and 24% reported that educational activities in SL were a positive experience for them (Levine, 2008).

Bowers et al. (2009) surveyed instructors to determine the value of SL in an educational environment. Post-secondary instructors currently using SL as an educational tool, or who had used it in the past, were chosen as the population for the study. Of the 251 instructors contacted, 162 responded representing 25 disciplines, and about half of the respondents taught in the area of communications, education, or computer technology. Of the 162 respondents, more than 90% plan to use SL again in the classroom. It was noted that instructors who used SL as the main source to carry out a class liked it better than the instructors who used it only as an addition to a class (Bowers et al., 2009).

According to Bloomfield (2007) and Foster (2007), virtual worlds are a way for students to understand business because students can serve in different business capacities and role play business scenarios. Students at Johnson and Wales University use the business plans they write

for a course and implement them in SL, which gives them the chance to test their plans and discover positives and negatives of the plan (Mason, 2007).

Furthermore, the medical field has benefitted from the use of SL by teaching students about real-life conditions, medical practices, and health awareness (Boulos et al., 2007). Yellowlees and Cook (2006) evaluated the use of SL to educate people about psychosis hallucinations. They recreated the inpatient medical facility of the University of California, Davis, Medical Center and used actual patient hallucinations descriptions taken from audio and digital scripts. Throughout the simulation, participants encountered a variety of hallucinations, including voices, newspapers, guns, etc., ending with a survey to identify their experience in the simulation. More than 69% of visitors viewed the simulation as increasing their knowledge of both auditory and visual hallucinations, and more than 82% encouraged their friends experience the simulation (Yellowlees & Cook, 2006). Yellowless and Cook (2006) use the hallucinations simulation to help medical students understand what patients suffering from psychosis experience to enhance future patient's treatment.

Using Second Life in distance education

According to Linden Research (2009b), SL has become a path to creating a distance learning environment. It encourages students to participate and gives distance education students a sense of belonging and interaction with classmates and the chance to practice using technical skills in an environment unlike any other (Baldwin, 2009; Linden Research, 2009b; Walker, 2009a; L. Martinez, 2007). SL is a means to mix the traditional on-campus classroom setting with distance education to provide students with a strong interactive classroom (Alarifi, 2008; Johnson, 2006). According to Foster (2007), SL enhances communication among students especially in a distance education course and makes them more eager to learn. "… its [SL]

application in distance education still looks very promising to many educators and researchers because of its unique features and associated benefits brought by the virtual reality tool" (Zhang, 2007, p. 3).

Walker (2009a) recognizes that "online distance education" (p. 5) gives students the opportunity to explore new technologies and interact with their peers, which is often lost in a traditional distance education setting. Often times, because of the constraints of a distance education program, counseling students miss out on the opportunity to practice their techniques in an instructor-controlled environment; virtual environments lessen this problem because students can carry out the simulation in a SL environment (Walker, 2009a). Because distance education has become an education norm in today's society, it is necessary to find ways students can interact with other students in a particular class and still get the same quality of education via distance (Walker, 2009a).

Alarifi (2008), Levine (2008), Joseph (2007), and R. Martinez (2007) stated collaborating, networking, and building of new knowledge is a benefit in SL. Students can work with people around the world, which otherwise may be impossible, and collaborate on projects when distance separates two parties (Alarifi, 2008). Additionally, students can gain knowledge of other cultures and become more diverse by networking with a variety of people (Pence, 2007-2008; Zhang, 2007). "By using SL, instructors are able to create learning activities which emulate learning experiences that students may have otherwise only had by means of face-to-face interaction" (Walker, 2009a, p. 7).

Atkinson (2008) looked at the different types of communications in SL and ways for students in online classes to participate in asynchronous and synchronous communication. Lucia, Francese, Passero, and Tortora (2009) and Alarifi (2008) revealed that SL fosters successful

synchronous communication and social interaction while keeping students motivated to learn simultaneously. Atkinson (2008) and Zhang (2007) found that virtual worlds use different types of media—from voice and email communication to classroom material distribution—to communicate and enhance the students' experience. Educators provide students with information via note cards, images, landmarks, url links, etc. to improve the learning environment and simulate a traditional classroom (Alarifi, 2008; Atkinson, 2008; Johnson, 2006).

The University of Michigan-Dearborn School of Management uses SL to communicate with both instructors and peers, contribute to class discussion and group projects, and interact with others through different types of technology (Johnson, 2006). Even though distance education students in the counseling program at Regent University in Virgina were satisfied with the interaction, faculty and staff felt the program needed more application and practice. Therefore, Regent faculty built a "simulated counselor training facility" (Walker, 2009a, p. 4) in SL because it provided students with a much more intense interaction where they could communicate immediately (L. Martinez et al., 2007; Johnson, 2006). According to Girasoli and Hannafin (2008), asynchronous audio/visual communication used in educational settings allows students the chance to formulate what they are trying to say and lessens the anxiety of speaking face-to-face with peers. While audio/visual tools arouse critical thinking skills and motivation in students, the true possibilities of computer-supported learning have yet to be discovered (Girasoli & Hannafin, 2008). "Do not underestimate the distance learning potential of Second Life, especially when used in conjunction with voice and web-based tools" (Joseph, 2007, p. 12).

Virtual education in agriculture

Rhoades et al. (2008) found that agriculture students use email in typical and atypical classroom settings but few of them use new technologies such as SL. However, more than 10%

of the 317 agricultural students in a Rhodes et al. (2008) study implied that they wanted instructors to integrate SL into the classroom.

Kloepper, Zweiacher, Curtis, and Evert (2010) use SL as an educational tool in an *Introduction to Animal Science* course at Redlands Community College (RCC) in El Reno, Oklahoma. Because RCC does not have a poultry program, it collaborated with Auburn University to create *Eagle Island* and teach introductory animal science students about the poultry industry. Students tour the poultry processing facility, where they learn about food safety. The "Virtual Chicken Museum" (Kloepper et al., 2010, p. 45) gives students the opportunity to see the female poultry reproductive organs in 3D. Additionally, the students tour an "Egg Processing Facility" and "Research Unit" (p. 46). Students are expected to communicate and gather information throughout the simulation and encouraged to ask the Auburn faculty questions about the poultry industry. Kloepper et al. (2010) continue to research the use of SL in agriculture.

According to Jacobson et al. (2008), because of the changing needs in today's undergraduate population, educators face the obstacle of modifying courses and programs to accommodate students. To increase the enrollment in agronomy programs across the nation and implement the learning goals outlined in the *Liberal Education and America's Promise* (AAC&U, 2007) initiative, instructors are working to connect natural sciences and courses that attract and retain a wide variety of students (Jacobson et al., 2008). For example, Jacobson et al. (2008) used VFTs to familiarize students with the impact of urbanization and agriculture production while incorporating connections to social issues.

According to Bowers et al. (2009) and Walker (2009a), students often work with case studies, etc. because it is not feasible to teach real world experiences in a traditional classroom

setting. Mason (2007) addressed that SL can help students overcome problems in the classroom because they can do projects otherwise not feasible due to limited resources. Furthermore, SL gives students an opportunity to be creative and work hands on with different types of scenarios. They can explore and integrate old and new knowledge and formulate new ideas and perceptions (Hargis, 2008; Mason, 2007). "… an effective authentic learning project provides students with challenging, collaborative, multidisciplinary problems, along with support to meet these challenges" (Mason, 2007, p. 15). In SL, the Gene Pool, created by Texas Wesleyan University, features an interactive genetics lab where medical students and general visitors can learn about human chromosomes and DNA (Boulos et al., 2007). The U.S. Centers for Disease Control and Prevention use SL to educate visitors about public health, and The Ohio University Sim teaches users about food selection based on the health impacts (Boulos et al., 2007).

Discussions/Conclusions

After reviewing the literature, the authors concluded that, although SL is being used in multiple disciplines, agriculture is slow to adopt SL as an educational tool. Additionally, a limited amount of research is available on using SL as an educational tool, and a minimal amount of literature is available on using virtual education in agriculture. Just as counseling education uses virtual worlds to create and recreate traditional counseling settings (Walker, 2009a), colleges of agriculture could use SL to teach agriculture, conduct real-world simulations, and research without leaving the classroom or lab. Additionally, such VFTs designed by Jacobson et al. (2008) would help students understand agriculture in other regions.

If universities implement virtual worlds such as SL, they need to consider faculty and student adoption, effectiveness of SL in education, availability of hardware and software, and cost. Faculty and students must view the new technology as useful and be ready and willing to

adopt it (Johnson, 2006), and universities must be willing to incur the cost affiliated with full implementation of a product that will broaden their courses and include SL in the curriculum (Alarifi, 2008; Johnson, 2006). Alarifi (2008) and Zhang (2007) found that the technicalities of SL are high and, because of the lack of university support, it could be hard to implement SL on campus. However, Pence (2007-2008) noted that even with lack of support educators can still take advantage of different educational tools in SL. Nevertheless, Jacobson et al. (2008) concluded the VFT designed to enhance student learning about urbanization and agriculture production was worth the cost because of the educational benefits the students obtained. For those students worried about SL security and adapting to the culture, institutions host online learning and provide students with orientation to SL (Baldwin, 2009; Alarifi, 2008; Atkinson, 2008;). Additionally, according to Alarifi (2008), Hargis (2008), and Johnson (2006), SL islands can be secured so only enrolled students and faculty can enter a particular island; universities have the ability to close the virtual world campus to only enrolled students (Hargis, 2008).

Still, not enough research has been done to prove that virtual worlds and new technologies such as SL have a place in the educational world (Walker, 2009a). Consequently, more research needs to be done on the effectiveness and use of SL across the disciplines and the need to integrate new technologies, such as SL, into the agriculture classroom enhancing student engagement and participation. More research needs to be conducted on the effective use of new technologies in the agriculture classroom (Rhoades et al., 2008) and how instructors integrate SL into the curriculum (Bowers et al., 2009; Walker, 2009b; Alarifi, 2008). Colleges of agriculture across the country could use SL simulations in class and evaluate acceptance by faculty and students of such integration. As SL is integrated into courses, the opportunity for experimental research comparing SL to traditional methods—role play, case studies, etc.—will be available.

Furthermore, researchers could explore students' learning styles in SL and compare them to traditional learning environments.

Technology has changed and continues to change in today's society (Alston & English, 2007), and for agriculture to continue to be world leaders, faculty and staff at agricultural institutions need to stay abreast of the changing technology and find new ways to integrate it into the classroom. Additionally, having experience with SL and other new media will could help students be above the rest on their résumés (Rhoades et al., 2008). "As the 'net generation' enters into higher education, it is our challenge as educators to be prepared to offer students the type of engaging education that will not only help them learn but will also help them in their search for a career" (Rhoades et al., 2008, p. 177).

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Research Paper

Featuring Agriculture: A Qualitative Analysis of Postsecondary Students' Reactions to Agricultural Documentaries

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Abstract

Prior studies have found that television and movie portrayals of science and agriculture can influence attitudes and opinions toward the featured topic or issue. The prevalence of media in modern society emphasizes the need to better understand the possible impact representations of agriculture in entertainment media have on audience members' attitudes. The purpose of this study was to explore the influence two agricultural documentaries (*Food, Inc.* and *King Corn*) had on students' perceptions of agriculture. Students enrolled in two agricultural communications classes at a southwest university watched one documentary per class, and through reflective journaling, recorded their thoughts about the documentaries. These journals were then analyzed to determine dominant themes and key quotes. Overall, students stated they were upset and offended by the messages presented and sources used in each documentary. Although some students found both documentaries to contain interesting information, for the most part, they found the films to be one-sided and did not portray an accurate depiction of modern agricultural practices. The use of reflective journaling was effective because it allowed all students to provide their viewpoints in response to the films. It also allowed the students to practice writing response statements as some will work in public relations and may be expected to defend their industry should other negative documentaries about agriculture could be produced in the future. Additional research should further examine the effectiveness of reflective journaling and gather student perceptions to other films or television shows that feature agriculture.

Keywords

agricultural documentaries, entertainment media, young adults, teaching, cultivation, reflective journaling

Featuring Agriculture: A Qualitative Analysis of Postsecondary Students' Reactions to Agricultural Documentaries

Introduction/Literature Review

Agricultural science is a complex subject involving biology, chemistry, business, and politics. Combining those subjects creates a business that is difficult for many to understand, especially if one was not raised in or worked around agriculture. Because of these complexities and the separation of most Americans from production agriculture, many individuals' understanding of agriculture comes from information gleaned from the media—television, newspapers, magazines, Internet, movies and even documentary films (Retzinger, 2002). Previous research on agriculture in entertainment media found that agriculture was portrayed as negative (Ruth, Park & Lundy, 2005). However, Nisbet and Scheufele (2009) argued that media can help create a society that is more literate in the sciences, and communication about science should have diverse media—and this could include documentaries.

In recent years, two documentaries have received a great deal of attention for their representation of modern agriculture. Released in 2009, *Food, Inc.* is a documentary that presents a critical perspective on modern production agriculture in America. The film provides an in-depth examination of how today's production agriculture has changed in recent decades and how those changes affect consumers with a particular emphasis on the role of corporations in agricultural production. The documentary is divided into segments that describe different stops along the food production process such as poultry operations, processing plants, and grocery stores. The film features interviews with farmers, contract growers, food safety advocates, consumers, a labor union representative, and organic producers. A reviewer for *The New York Times* described the film as, "An informative, often infuriating activist documentary about the

big business of feeding or, more to the political point, force-feeding, Americans all the junk that multinational corporate money can buy" (Dargin, 2009, para. 1). When *Food, Inc.* was nominated for an Oscar for best documentary, several farm organizations vocally opposed the film's recognition due to the critical way in which agriculture was represented (Clare, 2010).

Another agricultural documentary, *King Corn*, released in 2007, showcases the adventure of two eco-activists – Ian Cheney and Curt Ellis – as they move to a rural area in Iowa to grow an acre of corn, apply for government subsidies, select seed and herbicides, and follow their crop all the way to the market place. During the movie, the filmmakers discuss the history of corn production in America and modern corn production practices. Through interviews with scientists, industry representatives, nutritionists, professors, and even the former Secretary of Agriculture Earl Butz, the two filmmakers examine the prevalence of corn in the public's diet. Many controversial topics are discussed in the film including the use of high fructose corn syrup and the dependence of farmers on government subsidies. In a review of *King Corn* for the Minneapolis-St. Paul Star Tribune, the reviewer said, "Nothing can scare me away from my beloved popcorn, but *King Corn* comes close" (Covert, 2007, para. 4). This film also sparked strong reactions from those in the agricultural community. Nolz (2009) said, "The documentary craftily twisted and turned to make farmers and ranchers seem like ignorant, greedy barbarians" (para. 2). Another commented: "I do fear that we, as producers, and small town residents, keep ignoring attacks and untruths, that movies like *King Corn* and people's perceptions of it, could be the 'ruination' of modern agriculture and rural America" (Gorrell, 2008, para. 34).

This research was conducted through the scope of cultivation theory, which states that people generally accept the worldview that is portrayed on television as truth (Gerbner, 1987). The theory claims that individuals will adapt their understanding of information based on what is

seen on television, and as an individual watches more television, his or her ideas will align with the "television view" (McQuail, 2005, p. 552).

Television is a highly influential medium due to its drama combined with images and messages (Gerbner, Gross, Morgan & Signorielli, 1994; Williams, 2006). Gerbner et al. (1994) even ventured to argue that television is, for most individuals, a primary source of daily information, indicating that television is a medium that should be used to communicate scientific and agricultural information. Gerbner (1987) said limited evidence exists that shows "exposure to science and technology through television entertainment appears to cultivate a generally less favorable orientation toward science . . ." (p. 112). Prior studies of how science is portrayed in movies have found that the depictions are often false, exaggerated, and not credible. In a review of 33 movies about human cloning, Cormick (2006) found the portrayal of this type of biotechnology was accurate only about 25% of the time. Cloning was primarily presented in a negative way that focused on rouge and evil scientists or corporations. The study did not provide a correlation between the films and public attitudes about cloning, but public opinion polls in Australia (where the study took place) showed that the public does have strong negative opinions toward human cloning.

In an agricultural context, Retzinger (2002) argued that the increasing gap of understanding between those who live and work in production agriculture and those who do not can be blamed on more factors than just changing demographics. The gap could be blamed on the corporate structure of modern food production that largely disguises the production stages from food to fork. "In place of information about farm economies or the agricultural practices which feed us, our recognized links to rural lands and rural lives are primarily visual, framed by car windows or television and film screens" (p. 46). In a critical analysis of several films that

feature agricultural plotlines, Retzinger (2002) found that the films did not help bridge "the gap between urban and rural citizens…these films construct a different gap, one that lies between an agrarian and pastoral myth and the commercialized, corporate forms of agriculture practiced in the United States" (p. 57). Retzinger did note that film may be an effective way to bridge this gap because it draws viewers who are willing to watch and learn.

Ruth, Park, and Lundy (2005) said research about the portrayal of agriculture in entertainment media is lacking. The researchers studied the influence reality television programming (*The Simple Life*) that featured agricultural scenarios had on the viewer's perceptions of agriculture. The study found that viewers who had more agricultural knowledge were more critical of how agriculture was portrayed, while those with less knowledge or experience in agriculture were not as sensitive to the representation of agriculture (Ruth et al.). These same researchers further explored this phenomenon using a fictionalized representation of agriculture (from the movie *Napoleon Dynamite)* to determine what impact the example had on opinions, attitudes, or perceptions of agriculture (Lundy, Ruth & Park, 2007).

Various teaching disciplines have used feature films as a successful teaching tool in their classrooms. Research in a university-level theatre education course found that by using this strategy for enriching the instruction of qualitative research methods stimulated discussion, helped clarify abstract concepts, and demonstrated how the cinematic arts can teach as well as entertain (Saldaña, 2009). Research in an undergraduate pharmacology course found that showing films closely related to the subject matter of lectures was useful in helping students learn about the topics presented and their relevance to society. Furthermore, students were more likely to attend lectures where films were integrated into lecture (Ventura & Onsman, 2009).

Research in geography classrooms found that experiencing various geographic images on screen, was a valuable learning resource in the absence of no firsthand experience (di Palma, 2009).

Lundy et al. (2007) recommended that educators use entertainment media's portrayals of agriculture in the classroom to encourage discussion and critical thinking. Although their study used a fictional account of agriculture, the recommendation of using films in class could apply to more non-fiction representations of agriculture such as documentaries.

Purpose/Research Objectives

The purpose of this study was to explore postsecondary students' reactions to documentaries that discuss various topics in agriculture. The following research objectives were developed to help achieve this purpose:

1. Describe the demographic characteristics of the participating students.
2. Describe students' opinions about how agricultural practices were portrayed in the agricultural documentaries.
3. Describe students' opinions of the sources used in the agricultural documentaries.
4. Describe students' reactions to the agricultural documentaries.

Methods/Procedures

The population for this study included 54 students (all over 18 years old) enrolled in two courses at a southwestern university. One course (ACOM 3300 Communicating Agriculture to the Public) had 35 students enrolled while the other course (ACOM 3301 Video Production in Agriculture) had 19 students enrolled. In order to improve participation, the instructors offered 10 extra credit points for students' participation in completing the survey portion of the study. The journaling portion was a required class component; however, students could elect not to

have their journals used in subsequent data analysis, which resulted in a total of 49 complete journals available for this study.

The two movies selected to show in the classes were *Food, Inc.* and *King Corn.* These movies were selected because they are directly related to the topics discussed in both classes. Students in ACOM 3300 watched *Food, Inc.,* which is a critical examination of the modern food system and presents topics in a visually-stunning manner. Students in ACOM 3300 frequently discussed current topics and issues in agriculture. Students in ACOM 3301 watched *King Corn* and discussed video techniques, shot selection, editing, interviewing, interview source selection, and other video production topics. All students also discussed how agricultural topics were portrayed and exposed to counterarguments.

The researchers obtained the university's Institutional Review Board approval before collecting data for the study. All research occurred within the normal class time and did not require any additional time outside of the class period. First, students completed a survey instrument that measured critical thinking, attitudes toward agricultural topics, and demographics. Only the demographics portion of this instrument is reported in this paper. Each instrument had an identification number printed on it that corresponded to each student's ID number on the reflective journal that was used each class period. Second, students completed a reflective journaling exercise before, during, and after each of the movies. The instructor in each course asked several thought-provoking questions before showing the movie and at several points during the length of the movie. After completing the movie, students were asked to record their overall reactions.

The use of a journal allowed students, in a non-intimidating environment, to record their reactions to the movies as they were being shown. Reflective journaling is useful for capturing a

student's perspectives at a certain point in time. It is also a learning experience that may have an impact on the student long after the actual lesson ends (Boden, Cook, Lasker-Scott, Moore, & Shelton, 2007). Using reflective journalism in the classroom can be an extremely useful tool, but instructors must provide clear guidance for the students when journaling or the exercise could be viewed as busywork instead of aiding personal growth and professional development. The instructor should discuss expected length of the journal entries, encourage students to link experiences to journaling content, and introduce the topics to be addressed in the entries (Hubbs & Brand, 2010). In this study, students were asked to respond to several question prompts before, during, and after the movies to encourage additional reflection. This approach allowed all students to have their opinions voiced instead of a few dominant few.

The reflective journals were transcribed in their entirety and each journal was saved as a separate Word document. Student were given unique pseudonyms to protect their identities when analyzing and reporting the results. Data were analyzed using open and axial coding. Using NVivo 8.0, a qualitative data analysis software, the researchers first made a wide inquiry, or open coding procedure, to categorize data (Berg, 2009). Following the open coding, the researchers axially coded the data, intensive coding around one category or open code.

Results/Findings

Objective 1: Describe the demographic characteristics of the participating students.

Forty-three students completed the demographic questionnaire prior to viewing the documentaries. Five students were in both classes. Students were between 20 and 25 years old (M = 21.47, SD = 1.351) with a mode of 21 years old. The majority of students were female (n = 28, 65.1%) and agricultural communications majors (n = 34, 79.1%). All classifications were represented with one freshman (2.3%), eight sophomores (18.6%), 19 juniors (44.2%), and 15

seniors (34.9%). The majority of respondents reported that their families own agricultural property (n = 30, 69.8%) and that they lived on a ranch or farm (n = 25, 58.1%). Only one student (2.3%) had seen *King Corn* prior to it being shown in class while four students (9.3%) had seen *Food, Inc.*

Objective 2: Describe students' opinions about how agricultural practices were portrayed in the agricultural documentaries.

The agricultural documentaries discussed a number of agricultural practices including concentrated animal feeding operations (CAFOs), processing plants, the use of pesticides and fertilizers, agricultural policies, and many more. The documentaries often presented the practices used in large-scale modern farming then provided information to cast these practices in a negative light. Many students questioned how the documentaries made modern agricultural production seem as if it was wrong. These students emphasized that in order to meet demand, production practices had to change from what was done 50 years ago. Terri said, "Society demands the food, but then criticizes how they got it. They have created this over the years with the idea of bigger, better, and faster."

Food, Inc. reported on the use of immigrant labor in meat processing plants. Students had very strong reactions to the use of immigrant workers, mostly from Mexico, in these factories. Some students voiced that these jobs should go to American citizens and not illegal immigrants. Linda explained, "There do not need to be illegals in the U.S. period. Those companies should give jobs to poor people in the U.S." Another student shared her strong opinion on this topic: "There's not an anti-immigrant movement. There's an anti-illegal immigrant movement! Why would you want them here? They're using our resources yet not paying taxes to this country!" Other students supported the use of immigrant labor. Chris said, "I am all for allowing

immigrants to do these jobs. They are willing to do these jobs and start a new life here, we should let them."

Several students said the treatment of workers in the featured processing plants was wrong while others disagreed. Mindy commented that this segment made her angry:

> They are all up in arms because the illegal immigrants are being jailed. The point is, these workers are illegal, and deserve to be deported. They don't pay taxes and they use our resources. They have no right to be treated fairly and to be in our country. It is not a bad thing to deport them.

King Corn focused on the specific changes made in corn production including the use of fertilizers, pesticides, and new crop varieties. Shauna said, "I think they are saying that corn is a huge industry that has evolved to produce the maximum yield. I don't think it's bad." Another student commented, "The tone is almost depressing. They make it seem like the increase in production is a bad thing."

Another area of emphasis in *King Corn* was the use of government subsidies for agricultural production. Many students said they did not know much about subsidies, but Gabrielle said "Without these subsidies, growers would quit the business and ultimately America's food source would collapse. Food prices would skyrocket and the economy would plummet." Students were supportive of government subsidies to sustain American agriculture. Margie said, "I think government payments are necessary. Some farms are producing food and fibers that help our country and sometimes farmers can't make enough to stay in business."

Several students noted that the documentaries emphasized CAFOs as detrimental to cattle and human health by linking the feedlot conditions to higher instances of *E. coli*. Marcie said, "I don't like the way they showed the feedlot. Not all cattle go to feedlots like that and not all have *E. coli*." Kelly noted that "meat must be produced rapidly because of the population's high demand, but that does not mean it shouldn't be made without care or concern for the people

consuming it."

Overall, students commented that the documentaries were biased against modern agriculture. Several students noted that in order to meet the demands of a growing population, changes are necessary to improve the efficiency of modern agriculture. When watching *Food, Inc.*, James said, "I feel like they are against how farming is done today. It kind of frustrates me because the announcer probably has no idea what he is talking about." While viewing *King Corn*, Melissa commented:

> I think the growth in production is killing the small family farm and there is a grudge for that, so they are in turn trying to blame all the growth on corn, and it was a smart idea, but the growth is needed for the U.S. to survive.

Objective 3: Describe students' opinions of the sources used in the agricultural documentaries.

At several points during the documentaries, students were prompted to provide their opinions of the sources interviewed or cited in the films. Overall, students were skeptical of the sources used in both films and said they were one-sided or biased. However, some students did not agree and said certain sources in both films were trustworthy. Students who watched *Food, Inc.* had strong reactions to several of the sources interviewed including a natural/organic farmer, a low-income Hispanic family, a food safety advocate, and poultry farmers.

The natural/organic farmer, Joel Salatin, received the strongest comments from students who scoffed at his criticism of modern agricultural practices. Several students described him as "gross," "backwoods redneck," and "idiot." Students reacted strongly to this segment because it showed him slaughtering chickens in an outdoor facility, which many students called "unsanitary." Beth said, "I laughed at this section because it shows a left field farmer and his incorrect procedures and expects other farmers to do the same." Chris explained:

> This source came off as being very bitter toward big farmer production and corporations in the beginning, then as the segment developed, he just came off as being very uneducated. He talked about being sanitary while handling a chicken carcass with no gloves or anything. He also made the claim that his operation is just as efficient as a large production plant. As someone who has been to a poultry production plant, there is no way that his claim is true.

The natural /organic farmer spoke about his production practices that emphasized how grass fed livestock and more hands-on care produces food that is healthier than other production practices. Craig said, "His plan might allow someone to feel better, but it is not efficient for the amount of food that is needed." Several other students agreed that his method of farming would not meet the public's food demands. However, some students did trust what this farmer had to say. James said:

> The source is very down to earth and believes in older methods of doing things which I believe is the right way to do things. They also do the chickens a old way which is good, but most people complain and say it is unsanitary. I think they should leave the man alone and let him do his thing.

To discuss the impacts of modern agriculture on the public's health (such as diabetes and obesity), *Food, Inc.* featured a low-income Hispanic family who chose to eat fast food because it was less expensive than buying vegetables from the grocery store. The father in the family was suffering from diabetes. Students said profiling this one family is not enough to explain the obesity epidemic or increase in diabetes among minority populations or youth. Vickie said, "the video was only about one family, and the way they eat. Not every family in America eats out all of the time, and not every family eats unhealthy." Other students commented that the family was unhealthy due to their food choices, not the agricultural industry. Kelly said:

> The video obviously makes us feel sorry for the family, but they are not being smart about their food choices. They are making an excuse for obese people, blaming it on the industry, but it is a personal choice to consume those foods.

Barbara Kowalcyk was another source interviewed in *Food, Inc.* who provoked a great deal of student feedback. She is a food safety advocate trying to pass Kevin's Law, which is named after her son who died from eating meat contaminated with *E. coli*. Students said interviewing her as a source on this topic was very effective and they had intense comments after viewing her segment. Mindy said, "What was shown was very emotional. I think anyone watching the mother speak about her son's death would be affected." Other students conceded that while her story was upsetting, food-borne illnesses are a reality in our food system. Douglas explained:

> This segment was pretty sad. The lady was upset and determined for a reason. She lost her son to a mistake by a meat producer. But, everything can't be perfect, people die every day from mistakes made by others that are out of their control. It would be nice to have 100% safe meat, but that will never happen.

Near the beginning of *Food, Inc.*, the documentary featured two poultry farmers who worked for large corporations (Tyson and Perdue). Overall, students said these sources seemed disgruntled and were not very reliable. Larry commented that "…the lady had a grudge against the company that she worked for and clearly wanted to hurt the company because the company hurt her." Students suggested that the documentary should have interviewed poultry producers who do not work for these large corporations or those who were not angry with the corporations for which they worked. Shelby said:

> I don't know about the farmers they have showed. The Kentucky guy sounded fake. The female says she is allergic from the meds because of what's fed to the chickens. Sounds fishy, she acts like it's oh-so-bad, then why does she do it? I feel that they still don't see the whole picture, not saying I know more, but they don't.

Food, Inc. provided information or sources who spoke against several large agribusinesses including Tyson, Perdue, Monsanto, and Smithfield. None of these companies

appeared on camera to refute the accusations made against them. Several students noted that the companies should be more transparent with their practices. Pam said:

> The fact Monsanto declined to be interviewed just really makes me think even more that they are in the wrong. Its almost as if they are too cowardly to speak about their business – yet they aren't too cowardly to ruin farmers lives?

Some students commented that they wanted to know the companies' response to the allegations made in the film, but acknowledged that whatever they said could be used against them. Other students wanted to hear from farmers who supported Monsanto, Tyson, and the other companies mentioned. Craig said, "I do wonder though if there were any people that were not mad at Monsanto that they could of interview."

Students who watched *King Corn* made comments about several sources interviewed including a corn farmer, a woman in a bar, the "corn-fed" guy, a rancher, a cab driver, and several doctors. The corn farmer students most commented about provided the acre of land for the filmmakers (Ian Cheney and Curt Ellis) to farm. He was viewed as helpful, knowledgeable, unbiased, and willing to teach. Kirsten said, "He knows more than the guys, so he now seems like the reliable good 'ol guy.' Showing his home and talking about generations make you see he values family and hard work." Margie said: "The farmer they chose, Chuck, has been interesting. He has done a good job explaining why they are going to do and making their project realistic."

Another source used in *King Corn* was someone students labeled as "lady in the bar." Sitting in a bar in the city where the documentary was shot, she provided her perspective on modern corn production practices and the impact on rural towns. Students had polar reactions to this source. Some students said she seemed uneducated and biased. Katelyn said: "The woman in the bar wasn't a very credible source. We had no idea how she related to the industry or how her feelings were formed." Denise said: "The woman didn't seem like the most likely source. She

could've been influenced by her alcohol for all I know so the setting didn't seem appropriate; however what she said made sense." Other students said she was a good source because she had observed the farming practices she was commenting on. Laura said:

> I do believe that what the lady said is partially true. I have seen many small farmers quit farming just because they weren't making any money and had to get a job to make more money to support their family.

The source used in *King Corn* who had the most negative response was someone the students called "corn-fed" guy, an individual that wore a cap that said "corn fed." This person was portrayed as a credible source, yet he was interviewed while he was sitting in his vehicle, and the documentary never explained his qualifications. Students commented frequently that this source had no credibility and was missing facts about the use of feedlots. Frances said "I think corn-fed is a terrible source. He was ignorant on the actual facts of a feed yard and just threw in information or just opinion that he had heard somewhere." Another student said "He is probably one of the worst sources to use! He looks like he hasn't showered in a month and probably has little education on the topic."

Another source used was Sue Jarrett, a cow/calf rancher in Colorado who discussed the use of feedlots and their reliance on corn as a feed source. Students said she was credible and good source because she talked about her experiences raising cattle. Valerie said, "I think that she was much more reliable source in that she raises and understands cattle and how they work." Other students acknowledged that she presented just one viewpoint and sometimes her opinions made feedlots sound negative. Kirsten said she was "a little confused; she's a rancher that sales her cattle to feedlots, but then acts like she is against them – pretty inconsistent source."

The final sources students commented about were a cab driver and medical

doctors, who were featured in the same segment. The cab driver was suffering from diabetes while the doctors provided their expertise on the topic of diabetes and obesity. A few students were not convinced the cab driver was a reliable source and he only represented one person's experience. However, most students found these sources credible and trustworthy. Craig said:

> The people they used as sources were credible. The doctors had studied it and the cab driver had experienced what he was talking about obesity and the amount of sugar that we consume together and has become a major problem.

Objective 4. To describe students' overall reactions to the agricultural documentaries.

Overall, students had much stronger and more critical reactions to *Food, Inc.* when compared to their comments about *King Corn.* After viewing *Food, Inc.* several students said the movie was skewed or biased. They said only one side of the arguments had been presented and important information was missing. Mindy said "The movie overall was very misleading…The public needs to be informed, but I feel this movie was hypocritical because it put the thoughts in people's heads, instead of encouraging them to find their own facts." Denise had strong opinions about Food Inc and explained, "I thought the overall documentary was liberal, radical, negative, and destructive to the ag industry." Jenna also commented, "They had some interesting facts, but parts could have been more educational and less opinionated."

The film discussed the production of organic foods and presented them as a healthier alternative than conventionally produced food. Students disagreed that organic foods are the best option to improve the quality of food available due to their expense and low productivity. Beth said: "Organic foods are costly, so not everyone can afford them, and organic foods cannot and will not feed the world."

Several students did enjoy *Food, Inc.* and said they learned more about agricultural issues after viewing the film. These students said the movie made them think and provided advice for people wanting to make a change. Vickie commented "*Food, Inc.* is a great documentary. It gives the audience a look on many different types of farming. It is a great eye-opener as to where our food actually comes from and what is included in it." Other students said the film was informative and enjoyable to watch. Kirsten explained her reaction to the film: "I had different feelings throughout – defense, pity, anger, confusion, but I though overall it was a proactive film with a good message…There are a lot of ag issues I never knew about before this movie."

Students who watched *King Corn* commented that the film provided viewers with a better understanding of what farmers do and how corn production has changed overtime. Students commented that the film was informative and, overall, provided a positive depiction of modern agriculture. Dillon said, "I think the movie covered many aspects of the corn industry to give the full story." Frances explained, "I think this documentary showed how the life of a farmer is. I do think there were some parts in it that were not relevant, but in the whole, it produced the right information." Many students in the class did not have a good understanding of corn production prior to watching the documentary, but commented after that it helped them understand this type of production. Margie said:

> There is a lot more to producing a crop and it going through the food system that people don't think about. If people knew what was really going on and how they could change it, I think things would be a lot different.

One specific aspect of the film students provided feedback on was the role of corporate farms and their impact on smaller, family farms. Shauna said, "It seems like accurate information, but I hate that it is becoming so industrialized." Michelle provided a longer explanation to support her viewpoint:

> Corporate farms are, in reality, what is needed. I think it is very sad that so many family farms are being shut down but, in the end, I think we need to look at it as what will feed the world. Some of these small farms don't produce enough. I wish that it didn't have to be that way, but at the same time, I don't want to starve, and neither do the farmers who are getting shut down.

Discussion/Conclusions

Nearly 80% of the participants were agricultural communications students and were either raised on a farm (58.1%) or their families owned agricultural property (69.8%). This background likely influenced the resulting opinions and perceptions students had of the information presented in the documentaries to be more sympathetic to the agricultural industry as a whole.

For the most part, students did not approve of how modern agricultural practices were presented in either movie, which is also what Ruth et al. (2005) and Lundy et al. (2007) found in their studies of how agriculture was portrayed in entertainment media. The participants noted that the documentaries were "critical," "biased," and lacking scientific facts when presenting the different agricultural practices. Many students discussed their own experiences in agriculture and how that differed from the portrayals presented in the movies. For example, many students said their families sold cattle to feedlots and they did not agree with how that practice was presented. Students who watched *King Corn* did note that they did not have as much exposure to this aspect of agriculture and they did not know corn was used in so many products. Students who watched *Food, Inc.* commented frequently on the role large companies had on modern agricultural practices. These comments ranged from accusing the companies of wrong-doing to more supportive feedback related to the jobs these companies provide.

Choosing appropriate interview sources is an essential part of the curriculum in both ACOM 3300 and ACOM 3301. Students in both classes disapproved of many of the interview sources used in *Food, Inc.* and *King Corn*. Students often questioned the legitimacy of the

featured sources and even suggested additional individuals who should have been interviewed. In each documentary, students found a source particularly bothersome. In *Food, Inc.,* this was Joel Salatin, the organic/natural producer. In *King Corn*, this source was the individual students called "corn-fed" because this was on his custom license plate. Students were especially harsh in their judgments of what these two individuals had to say.

In both movies, sources were used to explain and describe the increase in obesity and diabetes in the United States. The source used in *Food, Inc.*, a low-income Hispanic family, received much harsher criticism than the cab driver featured in *King Corn*. This difference in perceptions is likely due to the fact that the cab driver in *King Corn* had lost a great deal of weight by eating healthier while the family in *Food, Inc.* was shown eating at a fast food restaurant then discussing their health issues.

Gerbner et al. (1994) argued television is highly influential because of the combination of images and messages, including interview sources. Some students were concerned that the non-agricultural audience could be influenced by the interview sources in both documentaries because these sources may not have had a complete understanding of the agricultural industry. Many students did comment that the films should have used less biased sources and more sources who represent modern agricultural interests, including the U.S. Department of Agriculture and agricultural companies such as Monsanto, Tyson, and Smithfield.

Overall, students had very strong reactions to both documentaries. Many students expressed a tone of anger and took personal offense to some of the messages presented in the documentaries. Other students did note that they learned more about the corporate involvement in agricultural production after watching *Food, Inc.* Students who watched *King Corn* reported that they learned more about the realities of corn production – chemicals, transportation, storage,

farm subsidies, and different uses of corn for humans and livestock. The documentaries exposed students to the complexities of modern agriculture and made them realize that the way of life many of them enjoyed growing up is open to criticism and censure. These films stimulated students' imagination of how non-agricultural audiences might react to the information, which is good practice for future communicators as they work to provide facts or information to represent their organizations.

Several recommendations for agricultural communications practitioners can be made from this study. Individuals who work in the agricultural industry need to be receptive to watching or reading materials that may counter their own, or their organization's, viewpoints. Nolz (2009) even asked, "When are we going to create an accurate documentary to tell the world the REAL agriculture story?" (para. 4). Agricultural organizations and companies should be proactive and develop high-quality communication materials to tell agriculture's story because, as Retzinger (2002) noted, many individuals' understanding of agriculture comes from information gleaned from the media. Agricultural communications practitioners need to be prepared to counter accusations or false information about their organizations and the industry as a whole. This requires strategic thinking, issues management, and futuristic thinking, which all require time and effort. Although Monsanto did not comment on camera for *Food, Inc.,* the company did develop a website to address several points raised in the film (see Monsanto, 2010).

To help students recognize the variety of opinions about the agricultural industry, college instructors should incorporate these films, and other movies that depict agricultural situations, into their agricultural communications curriculum. Integrating movies such as these in the curriculum could allow students to begin practicing how to respond to counter-arguments or negative portrayals as most people's connection (or lack thereof) to agriculture is not going to

strengthen in the future. Another useful activity would be for students to collect information they said was missing or lacking from the documentaries then discuss how that information should be presented and distributed.

This study utilized reflective journaling for students to write their perceptions and opinions about the documentaries shown in each class. The journaling exercise was effective in allowing students to record their comments as they watched the films instead of trying to remember key points for later discussion. The journals allowed every student's voice to be heard, albeit in written format. Students who were hesitant or uncomfortable speaking in class were very insightful and provided a wealth of comments when writing their viewpoints in the journals. A future study could evaluate the reflective journaling process to determine what could improve the quality or thoroughness of students' comments.

Additional quantitative data were collected as a part of this study that will be analyzed for future research. This data can then be connected to the qualitative comments to provide a more in-depth explanation for students' opinions and perceptions. Another interesting study would be to show these documentaries to non-agricultural audiences to determine what impact the films may have on attitudes, opinions, and intentions to change behavior. This study could also be repeated with other documentaries or feature films that address agricultural topics and situations.

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Competencies Needed by Agricultural Communication Undergraduates:

An Academic Perspective

Research

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Competencies Needed by Agricultural Communication Undergraduates:

An Academic Perspective

Abstract

Communication competencies and skills needed by agricultural communication graduates are constantly changing due to the dynamic nature of the technology used by communication professionals. Although several studies have been conducted during the previous four decades to determine curriculum needs, the literature recommends reviewing curriculum every 2 to 5 years. This Delphi study was conducted to determine the competencies that agricultural communication faculty believe are needed for agricultural communication program graduates. Nineteen participants from 14 universities came to consensus on 79 statements. The ten statements receiving the highest level of agreement were "Ability to communicate in writing," "Ability to write clearly, concisely, tersely and to get to the point," "Highly developed writing skills," "Good writing skills," "Professional competence - able to practice effective communication - write / speak correctly, clearly in a style and form that is expected of the audience, profession they will serve," "Critical thinking," "Grammar," "Ability to communicate, both orally and in writing, ability to understand conceptual thinking and how it relates to communication," "Ability to find and use information sources both on and off the internet," and "Ethics." This study provides additonal information tohelp address Agricultural Communications National Research Priority Area 4: "What are the skills, competencies, and resources necessary to prepare professional agricultural communicators for success in various aspects of agricultural knowledge management."

Keywords: Curriculum, Delphi, undergraduate, faculty

Introduction

Agricultural communication professionals are "individuals who spend the majority of their professional time engaged in communication-related activities related to food or agriculture" (Mullett, 2006, p. 21). This is a profession with a long and rich history. Over the years it has seen the media by which information is transferred change and diversify: Print was the standard at the beginning of the last century, then radio allowed nearly instant broadcast of verbal information, followed by television, then computer based storage devices such as tapes, floppy disks, and CD-ROMs, to the present era in which near instantaneous transfer of information is possible via the Internet through portals such as blogs, Twitter, and an ever increasing variety of new and varied technologies (Doerfert, et al., 2004; Doerfert & Miller, 2006). Because of these changes agricultural communication graduates have a wide range of careers from which to choose: traditional careers such as journalism, public relations, telecommunications, photography, and advertising, along with emerging fields such as webpage design. In addition some students enter tangential careers such as sales, lobbying, and corporate training (University of Georgia, 2007). The variety of career options may be due to the intersection of disciplines found in this major: agriculture, journalism, public relations, policy, economics, law, science, and other disciplines, merge to produce students with a broad base of knowledge and skills (Tucker, Whaley, & Cano, 2003).

Just as communication technology has changed over time and the variety of career options have expanded, so have the communication needs and preferences of agricultural industry professionals (DiStaso, Stacks, & Botan, 2009; Doerfert & Miller, 2006). During the past four decades several studies have been conducted to determine what skills and competencies agricultural communication program graduates should possess to meet the needs of this changing

profession. Researchers have investigated the coursework, objectives, and competencies needed for graduates from the perspectives of alumni, industry professionals, and faculty that have been beneficial to the discipline (Bailey-Evans, 1994; Irlbeck & Akers, 2009; Kroupa & Evans, 1973; Morgan, 2009; Sitton, Cartmell, & Sargent, 2005; Morgan, 2009; Sprecker & Rudd, 1997; Terry, Lockaby, & Bailey-Evans, 1995; Terry et al., 1994), but due to the rapidly changing nature of the technology used in this profession, frequent evaluation of the curriculum is necessary to properly prepare students for careers (Doerfert & Miller, 2006; Ettredge & Bellah, 2008). Similarly, Terry et al. (1994) found that industry recommends curriculum be reviewed every 2-5 years to "reassess and readdress the agricultural communications curriculum" (p. 24).

Previous research has revealed much about what elements agricultural communication curriculum should contain. A 1989 study by Cooper and Bowen surveyed program graduates to determine what courses were most important for future agricultural communicators. Results indicated that writing ranked first, followed by editing, public relations, agricultural communications, agricultural economics, and advertising.

A similar study by Reisner (1990) inquired of faculty from 30 institutions to determine what courses were offered for students, providing a "snapshot" of current program curricula. Agricultural economics was the most common agriculture requirement, while courses focused on communication were writing, photography, and communications law.

In 1994, Terry et al. conducted an extensive study that obtained input from 80 representatives of seven selected agricultural communication organizations who rated over 100 concepts graduates should possess. The concepts receiving 100% agreement from the participants were communicating agriculture to the public, agricultural policy, geography, word processing, creative strategies, campaign planning, graphic design, news writing, reporting,

editing, ethics, design/layout, problem solving, speech writing, oral communications, script writing, and applying concepts during an internship.

Sprecker and Rudd (1997) conducted 26 interviews with instructors, practitioners, and alumni to determine curricular requirements. Four themes emerged: students need a broad understanding of agriculture, communication skills are more important than agricultural knowledge, students need to be proficient in a variety of communication tasks, and networking is a vital component of an agricultural communicator. The researchers concluded that being a communicator extended far beyond writing to include verbal and video communication, and opportunities for students to meet industry practitioners should be built into the curriculum.

A study by Sitton, Cartmell and Sargent (2005) investigated the curriculum needs for public relations. Using the instrument developed by Terry etal. (1994), respondents (n=70) indicated that general communication and public relations skills were more important than agricultural proficiencies. Skills used most frequently by public relations professionals included computer skills, human relation skills, time management, writing, and editing. An understanding of government and legislative policy topped the list of agriculture proficiencies, followed by interpreting data to make good business decisions, defining conservation, and identifying government regulatory agencies. General communication proficiencies included using appropriate style, describing the principles of journalism, apply writing and reporting skills, interviewing and editing. The most popular public relations proficiencies were effective writing, identifying problems and solutions, business knowledge, designing a marketing plan, and publicizing events.

Carpenter's 2009 study of 664 advertisements for journalism positions revealed that communication applicants in the area of new media should have a knowledge base beyond

journalism and communication. Moreover, new employees should possess technical skills such as ability to write code (HTML/CSS), post content to Web, and edit images. Standard communication skills desired by these employers were writing and editing, along with the ability to work under a deadline.

A recent Delphi study by Morgan (2009) inquired of 37 industry professionals to determine the competencies needed by agricultural communication graduates. Interestingly, most of the competencies receiving the greatest level of consensus could be considered as general workplace skills desired of any graduate: meeting deadlines, ethics, dependability, work ethic, oral communication skills, enthusiasm about agriculture, reliable, ability to multi-task, proper use of grammar, and business etiquette. Using the categories established by Terry et al. (1994), the communication competencies receiving the highest levels of agreement were verbal communications, understanding the "media mix," identifying barriers to communication, editing, and effective interviewing and reporting skills. Within the general education competencies the desired skills were grammar usage, writing, spelling, networking, and punctuation.

The American Association of Agricultural Education National Research Agenda (Osborne, 2007) encourages curriculum evaluation. Agricultural Communications Research Priority Area 4 is to determine "What are the skills, competencies, and resources necessary to prepare professional agricultural communicators for success in various aspects of agricultural knowledge management"(p. 11). Although much research has been conducted during the past four decades to investigate curriculum needs, when looking for recent studies that inquired of faculty to determine the competencies needed by agricultural communication graduates, none were found. To address this need, the Finch and Crunkilton (1999) model was used (see Figure 1).

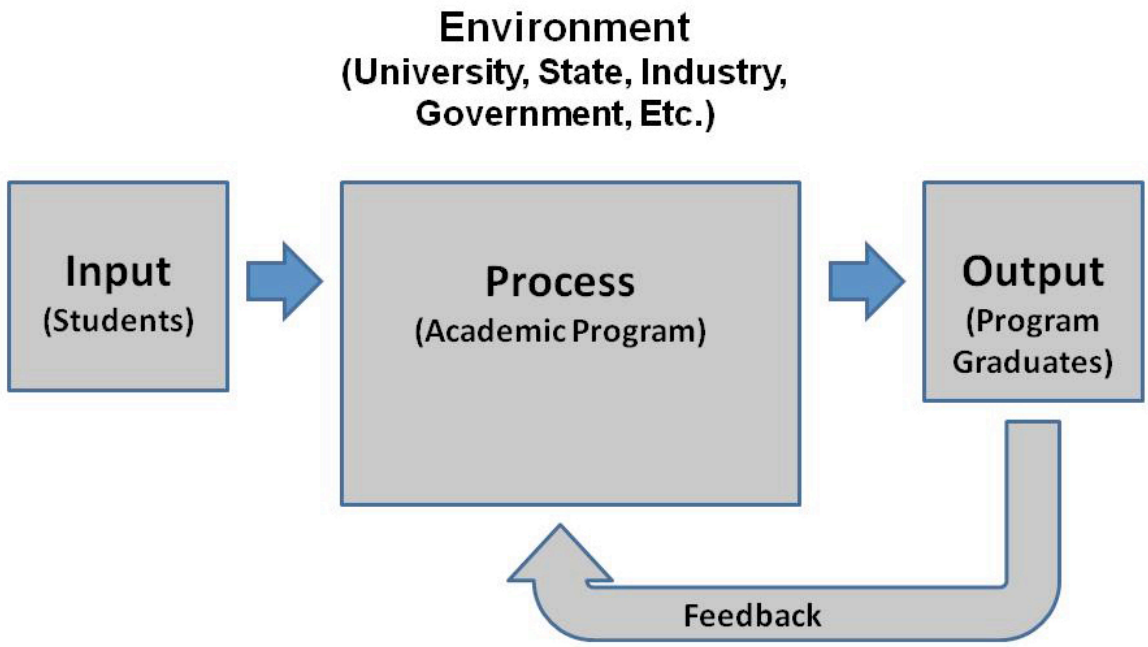

Figure 1. Program System Model. From Finch and Crunkilton, 1999, *Curriculum development in vocational education and technical education: Planning, content, and implementation* (p. 27), Boston: Allyn and Bacon.

This model illustrates that students enter the academic program, enroll in courses established by curriculum, and presumably graduate at a future date, at which time they begin their career. The academic program, where the curriculum resides, is affected by environmental forces: the university or college, the state in which the institution resides, industry, government, and perhaps the economy. In addition to the environmental forces, feedback is sought from graduates, forming a loop, which allows for program modifications to meet graduate needs.

It should be noted that faculty are not part of the environment, nor are they part of the feedback loop. Yet, they are the recipients of the environmental forces and feedback. Perhaps having a greater understanding of faculty perspectives would provide insight regarding the effects of the environment and the adoption of graduate feedback. In addition, previous studies have consulted faculty to determine existing program curricula and to determine the curriculum and competencies needed for agricultural communication programs (Reisner 1990; Simon,

Haygood, Akers, Doerfert, Davis, & Bullock, 2005; Sprecker & Rudd, 1997). Indeed, Flatt (1991) thought it wise to include faculty input in curriculum development.

Purpose and Objectives

The purpose of this study was to determine the competencies needed by agricultural communication graduates as perceived by agricultural communication faculty. The objective of the study was to identify the agricultural communication competencies that had the greatest level of consensus. The results of this research may provide baseline data of faculty perceptions that may be beneficial to future curriculum studies.

Methods

To accomplish the study objective a consensus of opinion among agricultural communication faculty was needed. The Delphi method is an efficient method to gather the opinion of experts and facilitate consensus among the experts (Dalkey, 1969; Stitt-Gohdes & Crews, 2004) and has been used in previous curriculum studies (Frick, 1993; Simon, Haygood, Akers, Doerfert, & Davis, 2005). An 80% level of agreement for each competency statement was established a priori as the level of agreement needed for statements to move from Round 2 to Round 3 and for Round 3 statements to attain consensus (Moreno-Casbas, Martin-Arribas, Orts-Cortes, & Coment-Cortes, 2001; A. Christian Morgan, Rudd, & Kaufmann, 2004; Simon, et al., 2005; Stitt-Gohdes & Crews, 2004).

To determine whom the participant list should include a national search was conducted to determine which universities contained agricultural communication or agricultural journalism undergraduate majors housed in the college of agriculture (or the college in which other agricultural departments were located), with a faculty member assigned to the major. A preliminary search was conducted using the American Association for Agricultural Education

directory, sorting the members by the research area of agricultural communications, which yielded 18 results, 15 of which were faculty representing 13 universities. The search engine Google was then utilized to search for "agricultural communication" and the first 100 results were evaluated.

Six websites were found which listed universities offering college degree programs (CampusExplorer.com, 2009; CollegeBoard.com, 2009; CollegeToolkit.com, 2009; Ed-reference.us, 2009; MatchCollege.com, 2009; The Princeton Review, 2009). Searches for agricultural communication and agricultural journalism programs were conducted within each of these websites which yielded an additional 10 unique programs. Further evaluation of the 100 Google search results revealed three more unique programs. From this list of 26, each program was evaluated based on the previously stated criteria which resulted in 17 unique agricultural communication programs consisting of 15 Land-grant and two state non-Land-grant universities. Faculty from each program were emailed invitations to participate in the study; for programs with more than two faculty members, two faculty were randomly selected for the study, resulting in 25 invited participants.

Using the Tailored Design Method (Dillman, 2000) these faculty (n = 25) were contacted via email to participate as the expert panel for this study and 19 responded to the first round of the study in which participants answered the question, "What competencies are needed for agricultural communication bachelor of science graduates?" and demographic information, yielding a response rate of 76%.

The statements from Round 1 were categorized using the constant comparative method (Glaser & Strauss, 1967), yielding 144 statements. In Round 2, these statements were presented to the 19 participants that responded to the first round, and asked to rank their level of agreement

to each statement using a Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). All of the participants responded, yielding a response rate of 100%.

Means and standard deviation of Round 2 responses were calculated and statements receiving an 80% or higher level of agreement ($M \geq 4.00$) were passed to Round 3 ($n = 98$). After sorting by level of agreement, from high to low, these statements were presented to the participants using a Likert-type scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) to force a positive or negative response to each statement. The 19 participants from the second round were asked to partake in Round 3 and 17 responded, yielding a response rate of 89.5%. Dalkey (1969) stated that reliability was greater than .80 when the expert panel was 13 or larger.

Seventy-nine statements received an 80% or greater level of agreement. These statements were then categorized using the criteria established by Terry, Lockaby, and Bailey-Evans (1995) of Core Area, Discipline, and Competencies. Some statements could not be properly categorized using this system, so these statements were labeled the term Miscellaneous.

Results

Participants consisted of nine females and 10 males, with ages ranging from 28 to 83 years, with a mean of 46.28 years. The mean number of years in the communications field was 15.79, with a range of 2 to 53. Similarly the average time in academia was 15.63 years, with a range of 2 to 36, while the number of years in their current position ranged from 1 to 25 years, with a mean of 9.26. This panel represented 12 Land-grant and two non-Land-grant universities.

The statements on which participants came to consensus ($n = 79$) were categorized using the criteria established by Terry, Lockaby, and Bailey-Evans (1995) which consisted of three Core Areas of study: Agriculture, Communication, and General Education. Within these Core

Areas are Disciplines and within Disciplines are Competencies. Numbers in parentheses after the statements indicate the level of agreement for the statement.

Of the 79 statements, 28 were categorized as being within the Core Area of Agriculture (see Table 1). The statements ranked highest in this Area were "Professional competence - able to practice effective communication - write / speak correctly, clearly in a style and form that is expected of the audience, profession they will serve" (95.3%), "Critical thinking" (95.3%), "Ability to communicate, both orally and in writing, ability to understand conceptual thinking and how it relates to communication" (93.8%), "Ethics" (93.3%), "Listening skills" (92.2%), "Ability to understand the agricultural industry" (89.1%), "Organized thinking skills" (89.1%), "Problem solving skills" (89.%), and "Communication specific software skills (image manipulation, illustration creation, document design/layout, web creation; e.g. CS4)" (89.1%).

Table 1

Agriculture Core Area Disciplines and Competencies

Statement	Discipline	Competency	Level of Agreement	SD
Professional competence - able to practice effective communication - write / speak correctly, clearly in a style and form that is expected of the audience, profession they will serve	Internships	Development of Personal Skills	95.3	0.40
Critical thinking	Internships	Problem Solving	95.3	0.40
Ability to communicate, both orally and in writing, ability to understand conceptual thinking and how it relates to communication	Internships	Development of Personal Skills	93.8	0.45
Ethics	Agricultural Leadership	Ethics	93.3	0.46
Listening skills	Internships	Development of Personal Skills	92.2	0.48
Ability to understand the agricultural industry	Agricultural Communications	Communicating Ag to the public	89.1	0.51
Organized thinking skills	Internships	Problem Solving	89.1	0.51
Problem solving skills	Internships	Problem Solving	89.1	0.51

Communication specific software skills (image manipulation, illustration creation, document design/layout, web creation; e.g. CS4)	Agricultural Communications	Agricultural Publications	89.1	0.51
Interpersonal communication skills	Internships	Interpersonal Relations	85.9	0.51
Analytical skills	Internships	Problem Solving	85.9	0.51
Critical analysis	Internships	Problem Solving	85.9	0.63
Internship or other experiential learning opportunity	Internships	Miscellaneous	85.9	0.63
Ability to work in teams	Agricultural Leadership		85.9	0.63
Interpersonal communication skills	Internships	Interpersonal Relations	84.4	0.50
How to work in journalism settings, or in the areas of public relations or advertising (contingent on the area of focus for the individual student).	Internships	Application of AGCM Concepts	82.8	0.48
Basic understanding of the food system	Agricultural Communications	Communicating Ag to the public	82.8	0.48
Grasp of how to develop and manage a project timeline	Internships	Development of Personal Skills	81.3	0.58
Basic understanding of agricultural production	Agricultural Communications	Communicating Ag to the public	81.3	0.58
Project planning and management	Internships	Development of Personal Skills	81.3	0.68
Civility	Internships	Employee Responsibilities	81.3	0.77
Working knowledge of Adobe InDesign	Agricultural Communications	Agricultural Publications	79.7	0.54
Marketing skills	Agricultural Economics	Marketing	79.7	0.54
An overview and general background in agricultural topics and issues	Miscellaneous	Miscellaneous	79.7	0.66
Understanding of social networking for communication planning purposes	Miscellaneous	Miscellaneous	79.7	0.66
Basic economics (ag finance, government relations, media management)	Agricultural Economics	Miscellaneous	79.7	0.66
Practical knowledge or coursework in an area of agriculture	Miscellaneous	Miscellaneous	79.7	0.66
Ability to work with others in different locations (i.e. via distance)	Agricultural Leadership	Interpersonal Relations	79.7	0.75

The second Core Area was Communication, containing 23 statements on which the participants came to consensus (see Table 2). The statements given the highest level of agreement were "Ability to organize a set of facts or a collection of pieces of information into a coherent message" (92.2%), "Intellectual prowess - sound ability to think creatively and independently" (90.6%), "Editing" (89.1%), "Confidence in presenting in front of others" (89.1%), "Oral communication" (89.1%), "Persuasive communications (writing and verbal)" (89.1%), "Creativity" (89.1%), and "Audience analysis" (89.1%).

Table 2

Communication Core Area Disciplines and Competencies

Statement	Discipline	Competency	Level of Agreement	SD
Ability to organize a set of facts or a collection of pieces of information into a coherent message	Journalism	Reporting	92.2	0.48
Intellectual prowess - sound ability to think creatively and independently	Advertising	Creative strategies	90.6	0.50
Editing	Journalism	Editing	89.1	0.51
Confidence in presenting in front of others	Public speaking	Oral communication	89.1	0.51
Oral communication	Public speaking	Oral communication	89.1	0.51
Persuasive communications (writing and verbal)	Advertising	Campaign Planning	89.1	0.51
Creativity	Advertising	Creative strategies	89.1	0.51
Audience analysis	Miscellaneous	Miscellaneous	89.1	0.63
Journalism ethic	Journalism	Ethics in Journalism	85.9	0.51
Questioning skills	Journalism	Reporting	85.9	0.51
News writing	Journalism	News Writing	85.9	0.63
AP Style	Journalism	Miscellaneous	84.4	0.50
Interviewing	Journalism	Reporting	84.4	0.50
Familiarity with mainstream media	Miscellaneous	Miscellaneous	84.4	0.50
Communication campaign planning	Public Relations	Campaign Planning	84.4	0.50

Basic skills in multimedia. Knowing how to put words and pictures together in a Soundslides show, creating a podcast, Web site, video ... these skills would certainly make a graduate more marketable.	Journalism	Dissemination Systems	84.4	0.50
Layout and Design skills	Journalism	Design and Layout	84.4	0.50
They need to be able to ask questions that go beyond the narrow focus of a source who may try to restrict the conversation.	Journalism	Reporting	84.4	0.89
Digital photography	Photography	Camera Functions	81.7	0.46
Public relation foundations (knowledge and skills)	Public Relations	Campaign Planning	81.3	0.45
Graphic design principles and implementation	Advertising	Graphic Design	81.3	0.58
Knowing how to write stories for a Web-based publication (understanding how to "chunk" information into bite-sized pieces, for instance, and knowing how Web users scan a page) is important.	Journalism	Miscellaneous	79.7	0.40
Feature writing	Journalism	Miscellaneous	79.7	0.54

The final Core Area, General Education, contained 28 statements (see Table 3). The statements garnering the highest level of consensus were “Ability to communicate in writing” (100%), “Ability to write clearly, concisely, tersely and to get to the point” (98.4%), “Highly developed writing skills” (96.9%), “Good writing skills (96.9%), “Grammar” (93.8%), “Ability to find and use information sources both on and off the internet” (93.8%), “Punctuation” (92.2%), and “Openness to the unfamiliar” (89.1%).

Table 3.

General Education Core Area Disciplines and Competencies

Statement	Discipline	Competency	Level of Agreement	SD

Ability to communicate in writing	English	Miscellaneous	100.0	0.00
Ability to write clearly, concisely, tersely and to get to the point	English	Miscellaneous	98.4	0.25
Highly developed writing skills	English	Miscellaneous	96.9	0.34
Good writing skills	English	Miscellaneous	96.9	0.34
Grammar	English	Grammar	93.8	0.45
Ability to find and use information sources both on and off the internet	English	Technical Writing	93.8	0.45
Punctuation	English	Grammar	92.2	0.48
Openness to the unfamiliar	Miscellaneous	Miscellaneous	89.1	0.51
Reading	English	Miscellaneous	87.5	0.52
Professional (business) writing	English	Technical Writing	85.9	0.51
Technical - ability to literally use technology	Computer Applications	Electronic Communications /Networking	85.9	0.51
They need to appreciate language and precision with words.	English	Miscellaneous	85.9	0.63
Tolerance of others' attitudes, values and beliefs	Miscellaneous	Miscellaneous	85.9	0.63
New & emerging media -- its impact and use (e.g. creation of Web 2.0 and the resulting emergence of social networking like Facebook, Twitter, and other social media)	Computer Applications	Electronic Communications /Networking	85.9	0.63
Strategic thinking	Miscellaneous	Miscellaneous	85.9	0.63
Research skills	English	Technical Writing	85.9	0.63
Ability to integrate information from a broad array of sources to provide a well rounded analysis and plan of action	English	Technical Writing	84.4	0.50
General office word processing skills	Computer Applications	Word Processing	84.4	0.50
Working knowledge of Microsoft Word	Computer Applications	Word Processing	84.4	0.50
Be adaptive to contemporary technologies and able to expand a currently solid expertise in technology	Miscellaneous	Miscellaneous	84.4	0.50
Lifelong learning	Miscellaneous	Miscellaneous	82.8	0.60
Working knowledge of Microsoft PowerPoint	Computer Applications	Presentation Graphics	82.8	0.60
They need to be alive and aware of	Miscellaneous	Miscellaneous	82.8	0.79

the world around them				
They need to understand science in a general way	Miscellaneous	Miscellaneous	81.7	0.70
Networking skills	Sociology	none	81.3	0.58
Ability to understand conceptual thinking and how it relates to communication	Miscellaneous	Miscellaneous	81.3	0.68
General office presentation software skills	Computer Applications	Presentation Graphics	79.7	0.54
Web design	Computer Applications	Electronic Communications /Networking	79.7	0.66

Discussion and Conclusions

Participants varied greatly in their age and longevity of career. The mean age of the participants was 46.28 and further investigation reveals that most respondents are between 30-59 years of age (n = 11), with one being less than 30 years of age and one greater than 80. Regarding time in career, the mean number of years in the communications field was 15.79, with over half (n = 10) in the field less than 10 years. When analyzing time in academia, the mean was 15.63 years, with over 40% (n = 8) in academia less than 10 years. Likewise, the mean number of years in current position was 9.26. This seems to indicate that participants in this study were early in their communication careers, having engaged in other careers prior to communications. Similarly, many were relatively young in their academic careers as well. Perhaps this represents a trend that communication faculty explore other careers before pursuing the communication discipline.

The statements categorized into the Agricultural Core are broad and many seem to apply to any discipline, not solely agriculture. Many of these statements in this section accentuate the need for students to assimilate and apply the technical skills learned. The first statement "Professional competence - able to practice effective communication - write / speak correctly, clearly in a style and form that is expected of the audience, profession they will serve" (95.3%)

illustrates the for students to graduate having utilized the skills they have learned in a career environment. Similarly the statements "Critical thinking," "Ability to communicate, both orally and in writing, ability to understand conceptual thinking and how it relates to communication," "Ethics," "Organized thinking skills," "Problem solving skills," Analytical skills," "Critical analysis," Ability to work in teams," "Interpersonal communication skills ," "Project planning and management," "Grasp of how to develop and manage a project timeline," "Civility," and "Ability to work with others in different locations (i.e. via distance" would be qualities desired (even expected) of most (perhaps all) university graduates. Previous studies involving industry professionals have discovered the desire for graduates to possess these basic work place skills (Irlbeck & Akers, 2009; Alan C Morgan, 2008). Ideally a capstone course and/or internship would provide this experience.

Other Agricultural Core statements relate directly to agriculture. Skills such as "Ability to understand the agricultural industry," "Basic understanding of the food system," "Basic understanding of agricultural production," "An overview and general background in agricultural topics and issues," "Basic economics (ag finance, government relations, media management)," and "Practical knowledge or coursework in an area of agriculture" illustrate the need for a broad understanding of agriculture and current agricultural topics and issues. Agricultural communication graduates should have a broad background in agriculture so they will be prepared to actively engage the challenges and issues faced by agriculturalists. This is similar to the findings of earlier researchers (Alan C Morgan, 2008; Reisner, 1990; Sprecker & Rudd, 1997; Terry, et al., 1994) and supports recent findings of Carpenter (2009)who found that graduates should have an area of contextual knowledge beyond journalism.

Based on the established criteria, some communication skills were placed in the Agricultural Core. These include software competencies, such as "Communication specific software skills (image manipulation, illustration creation, document design/layout, web creation; e.g. CS4)" and "Working knowledge of Adobe InDesign." Having an understanding of software for communications was highlighted as well. Previous studies have found that knowing how to use a variety of software, and the ability to learn new software, was found to be more important than having expertise with specific software (Morgan, 2008).

Other skills that may be considered as general workplace or communication abilities were "Interpersonal communication skills," "How to work in journalism settings, or in the areas of public relations or advertising (contingent on the area of focus for the individual student)," "Marketing skills," and "Understanding of social networking for communication planning purposes." These are similar to previous findings (Alan C Morgan, 2008; Terry, et al., 1995). Interpersonal communication skills and working in journalism settings can be accomplished through capstone courses or an internship, while marketing and the use of social networking can be taught in courses focusing on these topics.

The Communication Area includes the Competencies related to journalism, such as "Editing," "Audience analysis," "Journalism ethic," "AP Style" and "Layout and Design skills." Yet, the statement with the highest level of agreement was "Ability to organize a set of facts or a collection of pieces of information into a coherent message" (92.2%), which indicates the necessity for student to be able to synthesize available information and then present that information in such a way that is understandable to the audience. This supports the results of previous studies (Alan C Morgan, 2008; Sprecker & Rudd, 1997; Terry, et al., 1994)

Gathering this information is an important part of communication. Statements such as "Questioning skills," "Interviewing," and "They need to be able to ask questions that go beyond the narrow focus of a source who may try to restrict the conversation" indicate the importance of graduates possessing reporting skills so they can effectively procure facts. In addition to reporting, the specific forms of writing, "Persuasive communications (writing and verbal)," "News writing," and "Feature writing" were found important as well. These abilities are similar to the skills revealed in earlier research (Ettredge & Bellah, 2008; Alan C Morgan, 2008; Sprecker & Rudd, 1997; Terry, et al., 1994), which emphasizes the importance of these foundational communication skills.

Beyond basic writing and reporting, being able to utilize current media to effectively communicate a message to an audience was found as well. Participants agreed that "Basic skills in multimedia. Knowing how to put words and pictures together in a Soundslides show, creating a podcast, Web site, video ... these skills would certainly make a graduate more marketable" and "Knowing how to write stories for a Web-based publication (understanding how to "chunk" information into bite-sized pieces, for instance, and knowing how Web users scan a page) is important." These multimedia and Web-based skills have been referred to as media convergence (Geimann, 2001; Lawson-Borders, 2010)

In addition to written communication, oral communication and creativity are valued too. "Confidence in presenting in front of others" and "Oral communication" were found possessing consensus, as well as "Intellectual prowess - sound ability to think creatively and independently" and "Creativity."

The General Education Area contains a wide spectrum of skills, including basis communication skills, which relate directly to communication professionals. The statement

receiving the greatest level of agreement in the study was "Ability to communicate in writing" (100%), and was closely followed by "Ability to write clearly, concisely, tersely and to get to the point," "Highly developed writing skills," "Good writing skills," "Professional (business) writing," "They need to appreciate language and precision with words," "Grammar," and "Punctuation." These statements indicate the necessity for graduates to be excellent writers, as skill that has been highly regarded in many previous studies (Cooper & Bowen, 1989; Ettredge & Bellah, 2008; Sprecker & Rudd, 1997)

Similar to findings in the Communication Area, the ability to seek out and synthesize information was discovered in this Area too. "Ability to find and use information sources both on and off the internet," "Reading," "Research skills," and "Ability to integrate information from a broad array of sources to provide a well rounded analysis and plan of action" indicate that having access to vast amounts of information via the Internet does not equate to possessing and utilizing this information. Although previous research did not address these skills, developing the ability to find valid information through effective research techniques may be more important now than in the past.

The ability to efficiently utilize current technology was made clear. Consensus was found in the statements: "Technical - ability to literally use technology," "New & emerging media -- its impact and use (e.g. creation of Web 2.0 and the resulting emergence of social networking like Facebook, Twitter, and other social media)," "General office word processing skills," "Working knowledge of Microsoft Word," "Be adaptive to contemporary technologies and able to expand a currently solid expertise in technology," "Working knowledge of Microsoft PowerPoint," "General office presentation software skills," and "Web design." This emphasis on technology was not found in previous studies, which focused more on the use of computers

and referred to "new and emerging media" as the "media mix" (Morgan, 2008, p. 7). Differing from the current study, Morgan (2008) found that the only software to which industry professionals came to consensus was Word® and PowerPoint®. Understanding current technology and envisioning how it can be used to efficiently share information is a key skill for graduates to possess. Technology will continue to change, providing new tools for professional communicators to quickly transfer information to targeted audiences.

This study provides information that may be valuable to institutions wanting to evaluate their current agricultural communication program. However, even as this research has affirmed some previous research, it has revealed additional questions that may be the topics of future investigations. Areas for further research include investigating how agricultural communication faculty enter their careers and if there is a "typical" or "preferred" track that prepares them for these academic positions. Additional studies should be conducted to determine if the competencies espoused by faculty align with the competencies stated by industry. It would also be interesting to determine how students rate these competencies and how student perspectives relate to those of faculty. Finally, it seems that the criteria established by Terry, Lockaby, and Bailey-Evans (1995) is in need of updating so that current agricultural competencies can be placed into categories that more closely represent the current state of the communication landscape.

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Readability of media information for Hurricane Ike Disaster Case Management Services

Category: Research paper

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Readability of media information for Hurricane Ike Disaster Case Management Services

Abstract

Disasters and crises are a common occurrence. During and after crises, the media plays a major role in the dissemination of information important for response and recovery from the crises. As such, the style, readability, and comprehension of these messages must be targeted to the primary population of interest. When action is required as a result of these messages, clear and concise information must be presented in order for the reader to know exactly how, when and where to react. In May 2009, a FEMA-funded disaster case management pilot program was launched and began providing services to people impacted by Hurricane Ike. Media releases to announce and recruit clients for disaster case management services as a result of damage or need from Hurricane Ike were analyzed for readability. The Flesch-Kincaid and Flesch Reading Ease formulas were used to evaluate the press releases and articles. In all cases, readability levels of media releases far exceeded the comprehension levels of the targeted population. Media releases for efforts such as this should be clear, concise, and written to account for the characteristics of the population.

Keywords: crisis communication, disaster communication, disaster recovery, FEMA, Flesch-Kincaid, Hurricane Ike, press release, readability

Introduction

Crises are unpredictable and not uncommon (Coombs, 2007). Incidents such as earthquakes in California, the Oklahoma City bombing, wildfires in Western states, flooding in the Midwest, and the 9/11 attacks are vivid reminders that Americans are not immune to crises. On September 13, 2008, a Category 2 hurricane—Hurricane Ike—made landfall over Galveston, Texas. Maximum sustained wind speeds were recorded at nearly 110 mph with higher gusts at times. Hurricane Ike was one of the largest hurricanes to hit the United States in recent years and became one of the costliest hurricanes in the Nation's history (FEMA, 2008). The upper Gulf Coast of Texas has a long history of hurricanes and tropical storms and is familiar with the devastation that follows. Recent history suggests that recovery efforts have become somewhat normal to the residents of the Gulf Coast.

Communities impacted by Hurricane Ike suffered immediate and long-term strains on families' financial stability, as well as health and human services, such as child care, public education, and senior support systems (FEMA, 2008). U.S. Department of Homeland Security's Federal Coordinating Officer stated, "We knew before Hurricane Ike even made landfall that it was going to be big, and that the recovery process was likely to be among the most complex the nation has ever experienced" (DeBlasio in FEMA, 2008, p. ii). The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) estimated that housing damages in the cities and counties impacted by Hurricane Ike would exceed $3.4 billion (FEMA, 2008).

Disaster case management can be defined as the partnership between an individual affected by a disaster and a case manager in the development of a disaster recovery plan. "Case management is a process that assists people in identifying their service needs, locating and

arranging services, and coordinating the services of multiple providers" (Government Accountability Office, 2009, p. 3). In May 2009, a FEMA-funded case management pilot program began servicing clients impacted by Hurricane Ike. The program contracted with three non-profit organizations to provide case management services to the impacted households in 34 Texas counties. Past disaster case management efforts had limited success with outreach to the target populations, possibly leaving individuals without much needed services (Government Accountability Office, 2009). Effective communications regarding the availability of services—targeted to the primary population of interest—is a vital component that must be addressed.

Crises may be unpredictable, but are not unexpected (Coombs, 2007). Crises have the potential to disturb stakeholders by creating outcomes that are negative or undesirable (Coombs, 2007). Stakeholders are "persons, groups, or organizations that must somehow be taken into account by leaders, managers, and front-line staff" when determining what the problem is and possible solutions to the problem (Bryson, 2004, p. 22). Effectively communicating solutions to stakeholders requires authors of press releases to know and understand their audience (Mencher, 2006) because "people often need to be convinced that there is something that can be done about a problem before they will participate" (Bryson, p. 25). When disaster strikes in the United States, FEMA responds to the crisis and assists in providing crisis management, but a recent Government Accountability Office report noted that FEMA has not included stakeholder input in recent Disaster Case Management projects (Government Accountabiliy Office, 2009).

Literature Review

"Creating awareness is probably the thing mass communications does the best" (McCall, 1983, p. 316). Public awareness is influenced by the way a story is portrayed and the way the media frames the issue (McCarthy, Brennan, De Boer, & Ritson, 2008). Therefore, effectively

communicating with the public through the media is a concern for agencies that deliver social services to families (McCall, 1983). A disconnect is not uncommon in large-scale operations (Krueger, Jennings, & Kendra, 2009), such as those related to hurricane recovery. Thus, it is important for organizations to beware of possible disconnect between how they intended for their message to be received and how the public actually receives it (Lundy, 2006). Correctly relaying organizational initiatives to the media for distribution to the public is therefore critical.

McCall (1983) noted several reasons for agencies that deliver social services to coordinate with the media. McCall's reasons pertaining to federally-funded case managers include (a) service providers must inform the public that their services are available; if a potential client does not know that a service is available and useful they may not seek out the service, (b) it is important that service providers are portrayed as making a positive contribution to the community that they serve; thereby gaining community support, and (c) if the first two points are reasonably achieved, the service providers' job will be easier.

Effective communication through mass media is advantageous in many ways. For public relations practitioners, mass media is a way to "insert information into the public agenda" (Walters, Walters, & Starr, 1994, p. 345). Typically press releases provide media outlets with information about issues, such as "consumer information, coming events, research, and other material of immediate concern" (Walters, Walters, & Starr, 1994, p. 347) that reporters do not have the time or resources to cover.

McCall (1983) noted several ways that communicating a message through mass media can be disadvantageous. First, "the mass media indiscriminately aim their words at everyone" (McCall, 1983, p. 315). Secondly, McCall noted that most individuals in the media's audience may not need the message, or that the message might be tailored for a specific portion of an

audience, yet the entire audience receives the message. The last disadvantage noted by McCall was that mass media messages may not be long enough or contain enough details to accurately convey the intended message. Hence, creating a specific message to reach only one audience with mass media is not only unlikely; it may require a message to be tailored to the point that editorial bias becomes part of the message (McCall, 1983). This is especially the case when researchers examine how and what information are included or excluded from a message by the media (McCarthy, et al., 2008).

A study of public opinion regarding the media coverage of the 9/11 terrorist attacks (Craft & Wanta, 2004) purported that discrepancies existed between the public agenda and the media agenda in the population examined. Craft and Wanta (2004) suggested that content of the media coverage of an event or issue may have contributed to the discrepancy. Craft and Wanta (2004) purported that media consumers may be less influenced by media coverage when the topic or issue directly affects them or has personal consequences, such as benefit or risk. Therefore, the idea that risk or benefit may sway consumers' opinions regarding a topic or issue becomes a concern when delivering disaster recovery messages to consumers via mass media.

Barnes and his associates' (Barnes et al., 2008) quantitative content analysis study on media agenda setting regarding Hurricane Katrina concluded that strong media agenda setting and bias can distort the media's ability to contribute to the recovery needs of the individuals affected in an emergency situation. Furthermore, Barnes and his associates iterated that the media must be consistent in the message that they convey to the public and ensure that the language that is used is appropriate for and sensitive to the consumers. This may be of particular importance in disaster case management given that "lower levels of literacy are found across the demographic spectrum but are more common in older adults; those with limited education, low

English skills, and low income; and those of ethnic or racial minority backgrounds" (Wilson, 2009, p. 34).

Both Walters, Walters, and Starr (1994) and Warren and Morton (1991) noted that readability is an important component of developing press releases that will be published. Not only were newspapers editing releases for editorial and stylistic preferences of the publication and audience, but also making the stories easier to read. "Public relations practitioners appear to write at a level that is more difficult to read than do journalists" (Warren & Morton, 1991, p. 118).

For a basis of comparison, it was recommended that health education materials be written at no higher than a fifth-grade reading level (Wilson, 2009). U.S. medical school readability standards for IRB statements is an eighth-grade reading level or below (Paasche-Orlow, Taylor, & Brancati, 2003). Although some individuals may read at a higher level, most prefer to read information written at the lower levels because it is easier to comprehend (Wilson, 2009).

Conceptual Framework

The Flesch-Kincaid and Flesch Reading Ease formulas served as the conceptual framework for this study. Low literacy could be a substantial barrier when communicating with the public through written documents (Baker, et al., 1996). To reach the largest audience it is important to be able to provide them access to information they can understand. To gain more readers, a simple-style of writing must be adopted. Simplification of messages will allow the audience to read it faster, be more likely to understand it, and retain the information longer (Flesch, 1974). A grade-level goal for messages to the public has been reported as low as fifth grade (Wilson, 2009) and commonly between 6th and 8th grade levels (Covello, 2007).

Approximately 75% of adults will be able to read a message at a sixth-grade level, and 90% at a third-grade level (Doak, Doak, & Root, 1996).

Readability formulas are mathematical equations developed to estimate the grade level required of a participant to read a particular message. Sentence length and vocabulary difficulty are the two most common factors assessed by these formulas (Doak, et al., 1996). One of the more popular readability formulas is the Flesch-Kincaid (Freimuth, 1979). Rudolf Flesch developed the Flesch Reading Ease formula in 1948. The formula "predicts human interest by counting the number of personal words (such as pronouns and names) and personal sentences (such as quotes, exclamations, and incomplete sentences)" (DuBay, 2004, p. 21). The formula for the Flesch Reading Ease score is

- FRE = 206.835 – (1.015 x ASL) – (84.6 x ASW)

where:

- ASL = average sentence length (the number of words divided by the number of sentences).
- ASW = average number of syllables per word (the number of syllables divided by the number of words).

In 1976, the U.S. Navy had the Reading Ease formula converted from a 100-point scale to an equivalent grade level scale renamed the Flesch-Kincaid formula (DuBay, 2004). As an example, a score of 6.0 means the selection can be read at a sixth-grade level. The formula for the Flesch-Kincaid Grade Level score is:

- F-KS = (.39 x ASL) + (11.8 x ASW) – 15.59

where:

- ASL = average sentence length (the number of words divided by the number of sentences)
- ASW = average number of syllables per word (the number of syllables divided by the number of words) (DuBay, 2004).

Interpretations of Flesch's Reading Ease Scores are listed in Table 1.

Table 1.
Flesch's Reading Ease Scores

Reading Ease Score	Style Description	Estimated Reading Grade	Type of Magazine	Estimated % of Adults
0-30	Very Difficult	College Graduate	College	4.5
30-40	Difficult	13th to 16th grade	Academic	33.0
50-60	Fairly Difficult	10th to 12th grade	Quality	54.0
60-70	Standard	8th to 9th grade	Digests	83.0
70-80	Fairly Easy	7th grade	Slick Fiction	88.0
80-90	Easy	6th grade	Pulp Fiction	91.0
90-100	Very Easy	5th grade	Comics	93.0

Note. Adapted from *The Principles of Readability* (DuBay, 2004).

Purpose and Research Objectives

A four-factor model of crisis management was proposed by Coombs (2007): prevention, preparation, response, and revision. This study focused on the recovery and revision aspects because public interest is often greatest with the factors associated with allowing them to return to some form of normalcy (Cain & Koch, 2003). Additionally, Government Accountability Office reports (Government Accountability Office, 2009) noted a necessity for FEMA to improve communication efforts related to disaster recovery. The research objectives for this study were as follows:

1. Examine readability statistics of press releases, publications, and general media as they potentially relate to available demographics of individuals enrolled in the DCM program;

2. Examine readability statistics of press releases, publications, and general media with the required FEMA statement; and
3. Examine readability statistics of press releases, publications, and general media without the required FEMA statement.

Disaster communication can be described as communication that occurs when "information regarding preparation for, response to, and recovery from natural disasters is exchanged, particularly between mass media and the general public" (Paul, 2001, p. 44). FEMA also stressed the importance of communication between all parties involved in the recovery efforts, by sharing information, ideas, knowledge, and resources with each other and those affected by the hurricane (FEMA, 2008). Researchers have suggested that audiences perceive disaster communications originating from the federal government and non-profit organizations as being trustworthy and not likely to be self-advocating (Paul, 2001).

FEMA often collaborates with multiple government and non-government agencies to facilitate successful recovery efforts and return residents of impacted areas to pre-hurricane status. Damage to homes, personal property, and businesses—in addition to the national economic hardships experienced across the country—have presented an especially challenging recovery process to families and individuals affected by Hurricane Ike. Recovery from disasters is often contingent upon effective communication (Paul, 2001), which has been evident in previous disaster recovery efforts, such as those after Hurricane Katrina. Case management agencies offering recovery assistance after Hurricane Katrina had limited success with coordinating outreach, which may have resulted in those most in need of case management not receiving services (Government Accountability Office, 2009). Thus, extra measures must be

taken to ensure that communications are effective in conveying the availability of services to all individuals impacted by the hurricane.

FEMA awarded a nearly $60 million grant to Texas Health and Human Services Commission (HHSC) to fund a Long-Term Disaster Recovery Case Management Pilot Program (DCM), to aid individuals and families in their recovery processes. The DCM was designed to provide long-term disaster case management services to more than 30,000 Texans impacted by Hurricane Ike. To provide case management services, HHSC contracted with three non-profit organizations to deliver case management services to affected individuals and families living in 34 counties in Texas' gulf coast region. "Case managers will help families obtain housing, furniture, and other needs necessary for their recovery by connecting them with existing local resources" (FEMA, 2009, p. n.a.). Texas AgriLife Extension Service was contracted by HHSC to act as an external evaluation team for the overall DCM Pilot Program.

The Organizations

Three unique nonprofit organizations were managed as one cohesive organization for the DCM project. However, each organization was considered to be autonomous in daily operations and in their interaction with the news media. Therefore, a brief description of each organization is provided for clarity.

The first organization (ORG 1) is an association of local governments organized for the purpose of resolving common area-wide problems through cooperation and coordination across numerous counties. ORG 1 has served their region for more than 50 years and has long standing relationships with many of the member organizations within their region.

The second organization (ORG 2) is a faith-based organization that has more than 100 years of experience at providing social services. ORG 2 is committed to providing long-term

grass-roots community level recovery efforts to southern states impacted by hurricanes. Their efforts include collaborating with local congregations, voluntary organizations, and local, state, and national agencies to contribute to and support the development of an efficient and effective long-term recovery effort.

The third organization (ORG 3) is a non-profit agency with more than a century of experience in providing individuals and families in urban low-income communities with the assistance. ORG 3's goals include helping people to lead productive, self-sufficient lives through work, education, and access to adequate health care.

The Population

Although demographic data were not directly collected by the researchers for the purposes of this study, demographic data were provided to the researchers by the organizations providing case management services. Thus, for clarity, demographic data of individuals served by the DCM project—as reported by each organization—are indicated in Table 2. A majority of individuals were more than 45 years of age, of an ethnicity other than White, female, and spoke English. Further, 52% of the population was classified as living below the poverty line. No data were available for education, but anecdotal evidence by the research team suggested that the majority of this population have a high school education or less.

Table 2**.**

Demographics of Individuals Being Served by the DCM Project

Category	*f*	%
Age		
Less than 18	209	1
18 to 25	670	4
26 to 35	2361	13
36 to 45	3234	18
46 to 55	4439	25
56 to 65	3550	20
66 to 75	2203	12
76 or greater	1255	7
Ethnicity		
African-American or Black	8611	45
American Indian or Alaska Native	47	0
Asian	1166	6
Hispanic or Latino	2709	14
Native Hawaiian or Pacific Islander	22	0
Other	3883	20
Tribal Affiliation	3	0
White	2819	15
Gender		
Male	5836	30
Female	13426	70
Income level*		
Below national poverty level	4423	52
Above national poverty level	4038	48
Preferred Language		
ASL	18	0
English	14618	88
French	3	0
Spanish	1188	7
Vietnamese	828	5
Other	33	0

Note. *Data were only available from two of the three organizations.

Procedures

Three sources were used to collect relevant data and served as the basis for analysis. Data were collected beginning in June 2009 and ended November 2009. The date range was considered appropriate, because each of the organizations were beginning to promote their recovery efforts during that period. “Many of the news stories and features that journalists write are based on press releases” (Mencher, 2006, p. 212). Therefore, press releases served as the primary documents for this analysis. The primary documents were obtained from the public relations officer of each organization, who provided the press releases distributed to media outlets in the upper Gulf Coast region of Texas (n = 33). Secondary documents (printed newspaper stories) were provided to the researchers by each organization’s public relations officer, who obtained the newspaper articles (n = 32) through correspondence with the major media outlets throughout the impacted counties identified by FEMA. Tertiary sources (electronic newspaper stories and news-based web sites) of data were collected by utilizing a Google Alert daily search with the keywords “Hurricane Ike disaster recovery,” “Hurricane Ike disaster case management,” “Hurricane Ike case-management,” “Hurricane Ike non-profit,” “Hurricane Ike FEMA,” and each of the organizations’ names, between June, 2009 and November, 2009. The Google Alert yielded approximately 16,800 articles, sites, etc.; of those, 100 articles were specifically related to the DCM pilot project.

Due to the scale of the recovery effort, local and regional news sources were considered appropriate. Duplicate texts were removed from the dataset before the initial data analysis began. Identical versions of a media outlet’s online and copy source articles were treated as a single article.

Data were analyzed using the Microsoft Word® 2007 and SPSS 17.0 for Windows platform computers. Flesch-Kincaid Grade Level, Flesch Reading Ease, average characters per word, average words per sentence, and average sentence per paragraph were reported for each press release and publication. Documents written by organizations funded by the DCM project were mandated to include a FEMA statement:

> *This document was prepared under a grant from the U.S. Department of Homeland Security's Federal Emergency Management Agency. Points of view or opinion expressed in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Homeland Security.*

This statement was required by FEMA to be included in all press releases provided from the organizations to media outlets, but not always included in all other forms of media. Analyses were conducted with the mandated FEMA statement and without, to better understand the impact the addition of the statement had on the articles' readability.

Results

Publication type, circulation, Flesch-Kincaid Grade Level, and Flesch Reading Ease scores are reported for each press release and publication by organization in Table 3. Each secondary document was paired with its primary news release when identifiable. There were 41 newspaper stories and websites for which the primary press release could not be identified. These documents were categorized as "general media." Flesch-Kincaid grade levels of the press releases with the FEMA statement ranged from 10.3 or tenth-grade level to 18.5 or post-graduate grade level; without the FEMA statement the range was 7.9 or eighth-grade level to 19 or doctoral level.

Table 3.

Flesch-Kincaid Grade Level and Flesch's Reading Ease Scores

			F-KS		FRE	
Press Release	Publication Type	Circulation	w/ FEMA	w/o FEMA	w/ FEMA	w/o FEMA
ORG 1						
PR1			17.5	17.5	15.5	15.5
	newspaper	7621	17.5	17.6	14.8	14.6
PR2			17.2	17.2	16.5	16.6
	newspaper	n.a.	--	15.7	--	22.3
PR3			17.4	17.4	15.6	15.6
	newspaper	3691	--	9.8	--	39.3
	newspaper	3600	--	15.7	--	24.0
	newspaper	36499	--	14.1	--	35.5
PR4			16.2	16.0	19.6	20.1
	newspaper	3400	--	8.7	--	50.3
	newspaper	10134	16.2	16.0	19.6	20.1
	newspaper	10134	--	12.7	--	34.2
PR5			17.2	17.1	15.1	15.1
	newspaper	1700	--	17.1	--	15.1
	newspaper	1700	--	17.3	--	19.8
PR6			17.2	17.2	16.2	16.3
	newspaper	8000	16.9	16.9	17.3	17.5
PR7			16.8	16.7	17.8	18.2
ORG 2						
PR1			10.3	10.4	44.6	46.1
PR2			13.8	13.5	31.8	32.9
	newspaper	9363	--	14.2	--	31.9
PR3			14.2	13.9	30.6	32.5
	newspaper	526440	--	8.8	--	54.2
PR4			14.2	13.8	30.1	31.9
ORG 3						
PR1			17.9	17.9	11.4	11.1
PR2			14.7	14.8	23.5	23.1
	newspaper	20480	--	9.1	--	54.6
	newspaper	n.a.	--	7.9	--	59.7
PR3			17.9	17.9	11.4	11.1
PR4			--	15.6	--	26.4
PR5			17.4	17.7	15.7	15.3
PR6			17.6	18.2	13.0	9.5
PR7			--	16.2	--	21.4
PR8			--	17.0	--	13.7
PR9			17.0	17.0	18.3	18.7
PR10			18.0	19.0	12.0	7.2
PR11			17.0	17.3	14.0	11.1
PR12			17.4	17.6	15.9	15.9
	newspaper	39793	17.0	17.1	17.7	17.9

			F-KS		FRE	
Press Release	Publication Type	Circulation	w/ FEMA	w/o FEMA	w/ FEMA	w/o FEMA
	newspaper	39793	18.3	18.4	9.4	8.9
PR13			17.4	17.7	16.2	15.7
PR14			17.4	17.7	15.9	15.3
	newspaper	6940	17.5	17.8	16.2	15.3
PR15			18.5	19.8	10.2	4.4
PR16			--	15.0	--	26.5
PR17			--	14.8	--	29.6
PR18			17.2	17.3	16.6	16.5
	newspaper	27131	17.0	17.0	17.6	17.9
	newspaper	3200	--	13.8	--	40.1
PR19			17.1	17.2	16.8	16.8
PR20			17.4	17.7	15.7	15.0
PR21			17.5	17.6	11.3	10.2
PR22			17.0	17.1	12.7	11.7
	blog		--	17.2	--	18.4
	blog		17.5	17.6	12.5	12.0
	website		17.3	17.4	12.0	11.0
	website		17.2	17.2	12.1	11.1
	newspaper	27131	17.2	17.3	11.3	10.0
General media						
	newspaper	2000	--	13.6	--	33.3
	newspaper	2000	--	12.9	--	37.1
	newspaper	2000	--	14.5	--	26.8
	newspaper	33082	--	13.3	--	36.8
	website	n.a.	--	13.6	--	37.8
	website	n.a.	--	14.8	--	25.2
	website	n.a.	--	14.6	--	31.9
	website	n.a.	--	10.0	--	61.3
	website	n.a.	--	7.1	--	72.7
	website	n.a.	--	6.9	--	74.6
	website	n.a.	--	9.5	--	59.5
	website	n.a.	--	11.7	--	52.2
	website	n.a.	--	15.6	--	34.4
	website	n.a.	--	5.4	--	66.8
	newspaper	4100	--	10.2	--	56.9
	newspaper	4100	--	11.7	--	48.2
	newspaper	13200	--	14.6	--	26.2
	newspaper	13200	--	13.0	--	33.9
	website	n.a.	--	14.7	--	33.5
	website	n.a.	--	15.6	--	23.9
	newspaper	7316	--	12.0	--	47.0
	website	n.a.	--	8.4	--	59.6
	newspaper	8619	--	17.0	--	13.7
	newspaper	25000	--	12.0	--	47.4

Press Release	Publication Type	Circulation	F-KS		FRE	
			w/ FEMA	w/o FEMA	w/ FEMA	w/o FEMA
	newspaper	25000	--	14.0	--	39.9
	newspaper	25000	--	9.3	--	60.2
	newspaper	25000	--	10.3	--	58.0
	website	n.a.	--	7.9	--	60.8
	website	n.a.	--	14.9	--	21.3
	newspaper	3600	16.6	16.5	20.2	20.7
	website	n.a.	16.2	16.2	25.0	25.9
	website	n.a.	--	11.5	--	42.0
	website	n.a.	--	10.3	--	58.0
	website	n.a.	--	13.2	--	40.1
	newspaper	1890	--	13.9	--	38.3
	newspaper	1890	--	14.5	--	34.7
	newspaper	7621	16.8	16.8	17.8	18.1
	newspaper	4000	--	16.5	--	17.8
	newspaper	4000	--	16.8	--	17.9
	website	n.a.	--	15.7	--	30.5
	website	n.a.	15.6	15.3	24.1	25.3

Note: F-KS = Flesch-Kincaid (Grade Level) Score; FRE = Flesch Reading Ease; w FEMA = with the FEMA statement; w/o FEMA = without the FEMA statement. Circulation indicates the daily circulation or the highest circulation reported by the Audit Bureau of Circulations. If circulations were not reported, the researchers contacted the publication via e-mail to obtain circulation information.

Publication type, average characters per word, average words per sentence and average sentence per paragraph are reported for each press release and publication in Table 4. The recommended average sentence length (AWS) for a standard (seventh- to eighth-grade) reading level was 17, the range for all data sources was 13.4 to 30.3 with the FEMA statement and 8.3 to 31.9 without the FEMA statement.

Table 4.
Flesch-Kincaid Grade Level and Flesch's Reading Ease Scores

Press Release	Publication Type	ACW		AWS		ASP	
		w FEMA	w/o FEMA	w FEMA	w/o FEMA	w FEMA	w/o FEMA
ORG 1							
PR1		5.4	5.4	26.0	26.1	3.0	3.2
	newspaper	5.5	5.5	25.7	25.8	3.0	3.2
PR2		5.4	5.5	25.4	25.4	3.0	3.2
	newspaper	--	5.4	--	22.4	--	3.0

Press Release	Publication Type	ACW		AWS		ASP	
		w FEMA	w/o FEMA	w FEMA	w/o FEMA	w FEMA	w/o FEMA
PR3		5.5	5.5	25.7	25.8	3.0	3.2
	newspaper	--	5.5	--	8.3	--	2.0
	newspaper	--	5.4	--	23.6	--	1.8
	newspaper	--	5.2	--	23.4	--	1.2
PR4		5.4	5.4	22.8	22.6	3.4	3.7
	newspaper	--	4.9	--	10.1	--	1.1
	newspaper	5.4	5.4	22.8	22.6	3.4	3.7
	newspaper	--	5.3	--	17.3	--	1.4
PR5		5.5	5.5	24.4	24.3	3.0	3.2
	newspaper	--	5.5	--	24.3	--	3.2
	newspaper	--	5.4	--	27.5	--	3.0
PR6		5.5	5.5	25.2	25.3	3.0	3.2
	newspaper	5.4	5.5	24.7	24.6	3.0	3.2
PR7		5.4	5.5	24.3	24.2	3.2	3.5
ORG 2							
PR1		5.3	5.2	13.4	14.5	2.0	2.1
PR2		5.3	5.3	20.0	19.5	2.3	2.3
	newspaper	--	5.2	--	22.0	--	2.5
PR3		5.3	5.3	21.2	20.8	2.5	2.5
	newspaper	--	4.8	--	12.6	--	1.0
PR4		5.3	5.3	20.8	20.3	2.5	2.5
ORG 3							
PR1		5.6	5.7	25.8	26.5	1.6	1.5
PR2		5.7	5.8	27.1	29.6	2.1	2.0
	newspaper	--	5.4	--	24.2	--	1.5
	newspaper	--	5.7	--	25.4	--	1.7
PR3		5.6	5.6	25.3	25.8	1.7	1.7
PR4		5.6	5.8	27.3	29.8	2.1	2.0
PR5		5.7	5.8	27.6	30.5	2.1	2.0
PR6		5.6	5.7	25.8	26.5	1.6	1.5
PR7		5.6	5.6	25.3	25.8	1.7	1.7
PR8		5.8	5.8	29.8	30.2	2.0	2.0
PR9		5.6	5.7	26.1	26.9	1.6	1.5
PR10		5.6	5.7	25.8	26.5	1.6	1.5
PR11		5.6	5.7	26.2	27.0	1.6	1.5
PR12		5.7	5.8	26.9	29.2	2.1	2.0
	newspaper	--	5.2	--	22.1	--	1.6
	newspaper	--	5.1	--	23.1	--	3.5
PR13		5.6	5.7	25.3	25.8	1.7	1.7
PR14		5.6	5.6	25.0	25.4	1.7	1.7
	newspaper	--	5.0	--	24.9	--	1.4
PR15		5.6	5.7	25.2	25.6	1.7	1.7
PR16		5.6	5.7	25.8	26.5	1.6	1.5

Press Release	Publication Type	ACW		AWS		ASP	
		w FEMA	w/o FEMA	w FEMA	w/o FEMA	w FEMA	w/o FEMA
PR17		5.7	5.8	23.6	23.4	1.5	1.5
PR18		5.7	5.8	22.5	22.1	1.5	1.5
	newspaper	--	5.5	--	26.2	--	1.0
	newspaper	5.7	5.8	24.4	24.4	1.5	1.5
PR19		5.7	5.8	23.2	23.0	1.5	1.5
PR20		5.7	5.8	22.7	22.3	1.5	1.5
PR21		5.8	5.9	22.5	22.1	1.5	1.5
PR22		5.7	5.7	25.2	25.3	1.8	1.8
	blog	5.6	5.7	30.3	31.9	1.6	1.6
	blog	--	4.9	--	14.0	--	2.0
	website	--	5.0	--	12.2	--	1.0
	website	5.7	5.7	25.2	25.3	1.8	1.8
	newspaper	--	5.4	--	26.0	--	1.0
General Media							
	newspaper	--	5.1	--	28.7	--	2.3
	newspaper	--	4.3	--	20.6	--	3.0
	newspaper	--	5.7	--	26.4	--	2.8
	newspaper	--	5.5	--	20.6	--	1.2
	website	--	5.1	--	22.5	--	1.2
	website	--	5.2	--	22.8	--	1.8
	website	--	5.5	--	20.7	--	2.0
	website	--	4.8	--	21.8	--	4.5
	website	--	5.3	--	23.6	--	3.3
	website	--	4.4	--	21.5	--	3.2
	website	--	4.4	--	18.3	--	3.3
	website	--	4.6	--	24.7	--	3.0
	website	--	5.6	--	24.6	--	1.7
	website	--	4.9	--	13.0	--	1.2
	newspaper	--	4.6	--	19.7	--	1.5
	newspaper	--	4.9	--	21.2	--	1.5
	newspaper	--	5.5	--	20.3	--	1.4
	newspaper	--	5.1	--	25.9	--	1.3
	website	--	5.6	--	24.3	--	3.0
	website	--	5.0	--	21.4	--	1.4
	newspaper	--	5.0	--	21.6	--	1.9
	website	--	5.0	--	25.5	--	1.7
	newspaper	--	5.5	--	28.3	--	2.2
	newspaper	--	4.7	--	18.0	--	1.7
	newspaper	--	5.7	--	29.9	--	1.8
	newspaper	--	4.8	--	6.2	--	1.2
	newspaper	5.5	5.6	24.9	24.9	2.2	2.2
	website	--	5.7	--	25.4	--	1.7
	website	--	5.0	--	16.9	--	1.6

Press Release	Publication Type	ACW		AWS		ASP	
		w FEMA	w/o FEMA	w FEMA	w/o FEMA	w FEMA	w/o FEMA
	newspaper	--	4.8	--	21.8	--	4.5
	website	--	5.3	--	22.5	--	4.0
	website	--	5.5	--	20.6	--	1.2
	website	--	4.7	--	14.0	--	1.1
	website	--	4.9	--	24.5	--	1.5
	newspaper	5.6	5.6	24.4	24.4	2.3	2.3
	newspaper	--	4.9	--	6.4	--	1.2
	newspaper	5.3	5.2	26.2	26.4	3.0	3.1
	newspaper	--	4.2	--	16.2	--	3.0
	newspaper	--	4.1	--	17.0	--	3.0
	website	--	4.9	--	20.1	--	1.6
	website	--	5.0	--	19.7	--	1.9

Note: ACW = Average Characters per Word; AWS = Average Words per Sentence; ASP = Average Sentences per Paragraph; w FEMA = with the FEMA statement; w/o FEMA = without the FEMA statement.

A summary of the data reported in Tables 3 and 4 can be found in Tables 5 and 6. The mean Flesch-Kincaid Grade Level and Flesch Reading Ease scores for each organization and general media can be found in Table 5. Table 6 reports the means for average characters per word, average words per sentence and average sentence per paragraph for each organization's media.

Table 5.
Mean Flesch-Kincaid Grade Level and Flesch's Reading Ease Scores by Organization

Press Releases	*M* F-KS		*M* FRE	
	w/FEMA	w/o FEMA	w/FEMA	w/o FEMA
ORG 1	17.0	15.6	16.8	22.8
ORG 2	13.1	12.4	34.3	38.3
ORG 3	17.1	16.6	14.4	18.3
General Media	16.3	12.8	21.8	40.2

Note. M F-KS = Mean Flesch-Kincaid (Grade Level) Score; *M* FRE = Flesch Reading Ease; w FEMA = with the FEMA statement; w/o FEMA = without the FEMA statement.

Table 6.
Mean Flesch-Kincaid Grade Level and Reading Ease Variable Observations by Organization

Press Releases	*M* ACW		*M* AWS		*M* ASP	
	w/ FEMA	w/o FEMA	w/ FEMA	w/o FEMA	w/ FEMA	w/o FEMA
ORG 1	5.4	5.4	24.7	22.4	3.1	2.8
ORG 2	5.3	5.2	18.9	18.3	2.3	2.2
ORG 3	5.7	5.6	25.6	25.2	1.7	1.7
General Media	5.5	5.1	25.2	21.3	2.5	2.2

Note. M ACW = Mean Average Characters per Word; *M* AWS = Mean Average Words per Sentence; *M* ASP = Average Sentences per Paragraph; w FEMA = with the FEMA statement; w/o FEMA = without the FEMA statement.

A summary of the readability data from the DCM project is provided in Table 7 by overall project scores, organization scores, and by general media coverage of the DCM project that could not be tied to a specific press release.

Table 7.
Summary of Readability Data from DCM Project

	DCM Project		ORG 1		ORG 2		ORG 3		General Media	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
F-KS										
w/FEMA	16.77	1.44	17.01	0.48	13.13	1.89	17.34	0.68	16.30	0.53
w/o FEMA	14.62	3.22	15.59	2.64	12.43	2.26	16.64	2.39	12.84	3.04
FRE										
w/FEMA	17.48	6.73	16.80	1.74	34.28	6.92	14.38	3.22	21.78	3.37
w/o FEMA	29.42	16.94	22.78	10.19	38.25	9.57	18.33	12.11	40.25	16.43
ACW										
w/FEMA	5.55	0.14	5.44	0.52	5.30	0.00	5.66	0.07	5.45	0.13
w/o FEMA	5.31	0.40	5.41	0.15	5.18	0.19	5.61	0.27	5.09	0.42
AWS										
w/FEMA	24.68	2.69	24.70	1.15	18.85	3.67	25.60	1.95	24.70	1.20
w/o FEMA	22.72	4.99	22.42	5.28	18.28	3.80	25.16	3.96	21.66	5.00
ASP										
w/FEMA	2.15	0.62	3.10	0.17	2.33	0.24	1.71	0.21	2.40	0.41
w/o FEMA	2.10	0.85	2.78	0.86	2.15	0.59	1.66	0.42	2.16	0.94

Note. M = mean; SD = standard deviation.

Overall for the project, the Flesch-Kinkaid readability level was 16.77 with the FEMA statement and 14.62 without the statement. Organization reading levels ranged from 13.13 to 17.34 with the FEMA statement and 12.43 to 16.64 without the FEMA statement. General media

readability levels were 16.30 with the FEMA statement and 12.84 without the FEMA statement. In all cases the readability levels were well above the suggested levels.

Flesch Reading Ease Scores followed a similar pattern to the data presented for the Flesch-Kinkaid readability levels. All scores were in the Flesch Reading Ease Score range of difficult to very difficult. Scores of media releases with the FEMA statement scored higher difficulty for reading ease than those where the FEMA statement was not included.

Conclusions, Recommendations, Implications

Readability is an important concern in organizational and journalistic communication. As previously stated, approximately 75% of adults will be able to read a message at a sixth-grade level, and 90% at a third-grade level (Doak et al., 1996). In addition to literacy issues, simplifying messages can improve individual's ability to understand and remember messages. The mental noise theory posits when people are in an upsetting situation they have difficulty ascertaining, comprehending, and remembering information; thus, mental noise can reduce an individual's capacity to comprehend information by 80% (Covello, 2007).

Overall, the results of this study were consistent with previous research; press releases tend to be written at readability levels exceeding recommended guidelines. In nearly all cases, media documents used in the Hurricane Ike DCM project were well above the suggested reading levels for general media releases and public use. Inclusion of the mandated FEMA statement appeared to have elevated the readability of the materials, for the project, individual organizations, and general media. It is likely that readability levels of those documents had an impact on recruitment of clients into the project, although that could not be confirmed.

Future research in readability and crisis communication should examine the academic background and career experience of those who prepare communication on behalf of the social service agencies. In addition, education level of the target population should be considered as a

variable. Additionally, it was noted that in most cases, the variation between the original press release Flesch-Kincaid grade levels and the printed or electronic versions of the release, were not numerically different. Previous research (Walters, Walters, & Starr, 1994) indicated that "newspapers want the whole story in an average of 200 words, less than one page…double-spaced, averaging less than six inches deep in a 2.5-inch-wide newspaper column" (p. 354). Is it possible that the context of such releases, the process of disaster relief, or federal support from FEMA, deterred newspapers from making significant changes to the release?

Press releases from organizations providing disaster case management services should strive to reduce reading comprehension levels of press releases to levels between a sixth- and eighth-grade readability level, to obtain a higher level of readership and understanding, as well as improving likelihood of distribution in the media (Walters, Walters, & Starr, 1994). Several steps can be taken to improve the readability and comprehension of messages during the development process: Simplify the message and words to develop messages for a target audience between the sixth- and eighth-grade readability levels. Develop a limited number of key messages, and keep them brief. This keeps information in messages short and focused. Order the information in releases by priority. Although the public's mistrust of service providers during recovery efforts related to Hurricane Katrina was well documented, establishing credibility would seem secondary to explaining which services are available. Moreover, if FEMA or any branch of government mandates explanatory statements, those statements should be placed last in press releases, so as not to directly impact the readability of the primary message in an adverse manner.

Ultimately, it is important and necessary for social services agencies to coordinate with mass media for timely distribution of information. The development of messages, especially

involving the need for action from the reader, must be clear and concise accounting for the characteristics of the target population.

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Advertising Agrarian Unreality: College Students' Preferences for Agricultural Commodity Advertising Content

Research Paper

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Abstract

Critics of agricultural commodity groups claim that the advertising strategies used by those groups promote unrealistic perceptions of modern agricultural practices. The researchers sought to investigate young consumers' preferences for realistic versus unrealistic agricultural video content. Using an online survey questionnaire, the researchers compared undergraduate students' affective responses to content from the "Happy Cows" advertising campaign to those elicited from viewing educational video content pertaining to modern dairy husbandry practices. Subjects reported similar levels of *liking* for both video sets, while the informational videos scored higher for *realism* and perceived *quality of animal care*. Students with less familiarity with agriculture reported greater liking for the educational content. The researchers recommend a movement away from purely entertaining advertising content for agricultural products in favor of more realistic, fact-based promotions.

Key words: Uses and gratifications; visual imagery; schema congruity; advertising; television; dairy; commodity groups

Introduction

In 2000, the California Milk Advisory Board (CMAB) introduced American television viewers to a herd of talkative Holstein cows—and the pitch "Great cheese comes from happy cows. Happy cows come from California"—via an advertising campaign aimed at raising awareness of the state's large dairy industry (Glenn, 2004; Sherman, 2002). The award-winning campaign was a success, and by 2002 California was moving closer to Wisconsin in cheese production. The "Happy Cows" expanded into the online realm in 2008 with an *American Idol*-style contest that allowed consumers to choose the newest "spokes-cow" for the brand ("Consumers," 2008).

Entertaining television commercials are vital to the success of commodity sales, but CMAB was roundly criticized for presenting an unrealistic portrayal of modern dairy husbandry to the public ("Happy Cows," 2009; Meyer, 2009). The commercial's hyper-realized settings—lush green pastures and rustic barnyards—draw upon traditional views of farming and may encourage audiences to associate animal "happiness" with restraint-free "lifestyles," though the majority of dairy cattle in the United States are raised in some type of confinement system (Goodwin & Rhoades, 2010; Rollin, 2009).

Television advertisers do not "claim to picture reality as it is but reality as it should be" (Richins, 1991, p. 71; Schudson, 1984). Nonetheless, many scholars believe that the images presented in advertising content impact the way audiences perceive the world around them (Botta, 1999; Lodish, Abraham, Livelsberger, Lubetkin, Richardson, & Stevens, 1995; Moschis & Moore, 1982). Understanding the mechanisms that construct consumers' reality and the fulfillment they derive from watching commercial advertisements should offer some insight into the effects of advertising images on consumer perceptions. The theoretical framework for this

study, therefore, is built upon visual imagery, cognitive schema, congruity theory, and uses and gratifications (U&G) theory.

Visual Imagery in Television Advertising: Stereotypes and Animal Unreality

Television advertising represents a distorted "mirror" of society that promotes the idealization of reality—an idealization incongruent with the world experienced by audiences (Gulas & McKeague, 2000; Hirschman & Thompson, 1997; Richins, 1991). This "constructed unreality" is rife with stereotypes that advertisers use to communicate to target audiences: Women are placed in domestic settings, such as kitchens or bathrooms, to promote housekeeping products while men drive automobiles and peddle gasoline (Kim & Lowry, 2005; O'Donnell & O'Donnell, 1978; Weimann, 2000). Researchers have demonstrated that heavy television viewership tends to correlate positively with acceptance of conventional perceptions of masculinity and femininity and agreement with traditional family values among subjects of all ages (Kim & Lowry, 2005; Kimball, 1986; Ross, Anderson, & Wisocki, 1982; Volgy & Schwartz, 1980).

Non-human characters are not excluded from this taxonomy of stereotypes. Animals have long held great material, emotional, and symbolic value for humans, and the strong bond between man and beast is often exploited (Phillips, 1996; Spears, Mowen, & Chakraborty, 1996). Animals symbolize mankind's qualities, and they provide an "inexhaustible repository which novelists, poets, artists, dramatists, film makers, and even advertisers draw on…when they wish to evoke an immediate yet profound response" (Spears et al., 1996, p. 188; Rowland, 1973). There are more than 69 million pet owners in the United States, the majority of whom view companion animals as possessing altruistic, nurturing qualities (Lancendorfer, Atkin, & Reece, 2008).

Non-human characters are used in advertisements as "social symbols" to increase brand awareness, and for good reason: Consumers are more familiar with and have more positive attitudes toward brands that utilize animal-based advertising than brands endorsed by celebrities (Aggarwal & McGill, 2007; Lancendorfer et al., 2008; Phillips, 1996; Spears et al., 1996). Animals serve two primary symbolic functions: representing valued and desired qualities, such as loyalty and strength, or demonstrating the human-animal connection and enjoying human attention (Beirão, Lencastre, & Dionísio, 2007; Lerner & Kaloff, 1989). Advertisers often portray animals as loved ones, as tools, as nuisances, or as part of nature (Lancendorfer et al., 2008).

Humanization, or the attribution of human abilities like cognitive thought, speech, and discrete emotions to animals, is another tool used by advertisers to appeal to consumers (Aggarwal & McGill, 2007; Lerner & Kaloff, 1989; Spears et al., 1996). Examples of humanized animal mascots include Borden's famous Elsie, a Jersey cow with a daisy necklace, wide smile, and nuclear family that has become a "symbol of wholesome country living and freshness" (Spears et al., 1996, p. 88). In a similar manner, the California Milk Advisory Board's (CMAB) "Happy Cows," a herd of witty talking Holsteins, represent a connection between superior products and traditional production practices (Sherman, 2002).

Schema Congruity and the Agrarian Myth

According to researchers at the W.K. Kellogg Foundation, Americans perceive rural America as "serene and beautiful, populated by animals and livestock, and landscape covered by trees and family farms" (Kellogg, 2002, p. 1). A content analysis of television programs and large-market newspapers revealed that frames in news coverage of rural issues "linked 'rural'

with an agricultural or farmstead lifestyle" and an abstract, symbol-laden "idealized past" (Kellogg, 2004, p. 25).

Such symbolism is inherent in agriculture-related entertainment media, as well. Reality television shows like *The Simple Life* and *Farmer Wants a Wife* reinforce stereotypes about agriculture and professionals in the food and fiber industry, yet were popular among audiences when they aired in 2003 and 2008, respectively (Ruth, Lundy, & Park, 2005, p. 28; Rogers, 2003). The producers of *The Simple Life* staged scenes to represent a desired "look" for rural Arkansas: A dairy replaced its plastic jugs with old-fashioned glass bottles, and the show's stars, Paris Hilton and Nicole Richie, were shown filling them with unpasteurized milk (Paulsen, 2003). These "reality-based" portrayals of agriculture as outdated and simple could reinforce inaccurate perceptions about the industry ("Farmers fret," 2005; Lee, Bichard, Irey, Walt, & Carlson, 2009; Ruth et al., 2005).

While agricultural stereotypes are used as a comic backdrop for reality programming, modern industry practices are often negatively portrayed in entertainment media ("TV shows," 2009). In 2009, two highly rated television dramas—Fox Network's *Bones* and CBS's *CSI: Miami*—aired episodes centered on large-scale production agriculture ("Bones," 2009; "CSI: Miami," 2009). The *Bones* episode "The Tough Man in the Tender Chicken" offered narrative criticism of confinement housing, de-beaking, animal slaughter, waste pollution, and farm worker health. *CSI: Miami*'s "Bad Seed" followed an illness outbreak caused by runoff contamination and the consumption of genetically modified corn. Both shows lead their timeslots with a combined audience of more than 20 million viewers (Gorman, 2009; Seidman, 2009).

Such portrayals of agriculture may be dangerous because they violate society's long-held beliefs about the industry and its practices (Fraser, 2001; Wachenheim & Rathge, 2000).

Modern operations, relying on science and advanced technology, hardly resemble the pastoral images consumers associate with agriculture and rural life (Fraser, 2001; Holloway, 2004; Kellogg, 2004). These schema, or cognitive memory structures, "actively process and store information and generate expectations about future events and actions" and are used by belief systems to process, store, and organize information and produce perceptions of social reality (Allen, Dawson, & Brown, 1989, p. 83; Smith, Houston, & Childers, 1985).

Images and ideas that correspond to consumers' schema or beliefs are said to be "congruent" (Feiereisen, Broderick, & Douglas, 2009). Advertising portrayals that are consistent with a viewer's schema tend to elicit more positive responses than incongruent portrayals. Advertisers, therefore, capitalize on consumers' tendency to humanize products and brands by introducing spokes-characters that tap into schemas related to the products, characters, or commercial context (Aggarwal & McGill, 2007; Feiereisen et al., 2009; Orth & Holancova, 2004).

Uses & Gratifications of Television Advertising

Researchers have long sought to understand how and why audiences use media (Cantril, 1942; Herzog, 1944; Ruggiero, 2000). Uses and gratifications (U&G) theory was developed to "study the gratifications that attract and hold audiences to the kinds of media and the types of content that satisfy their social and psychological needs" and their possible influence on audience's perceptions of that content (Ruggiero, 2000, p. 3; Cantril, 1942; Cooper & Tang, 2009). Theorists who study U&G believe that audiences are aware of their needs, evaluate potential media channels and content, and choose media that they believe will fulfill those needs (Katz, Blumler & Gurevitch, 1974; Nabi, Stitt, Halford, & Finnerty, 2006; Rubin, 2002).

Motivation typologies are a product of uses and gratifications research. Early television scholars identified surveillance, entertainment, personal identity, escape, and companionship as the needs fulfilled by TV consumption, while contemporary researchers have added diversion, social utility, and attitude and belief reinforcement (Kang & Atkin, 1999; Ruggiero, 2000; Weimann, Brosius, & Wober, 1992; Zaichkowsky, 1994). O'Donohue (1994) developed a typology specific to television commercials based on young people's "attitudes, interpretations and uses of advertising," (p. 57), which included marketing uses information, enjoyment, scanning the environment, and self-affirmation.

Other researchers suggest that attitudes toward advertisements correlate positively with perceived levels of entertainment and are negatively associated with irritation (Ducoffe, 1996; Lee & Morris, 2010; Wang, Zhang, Choi, & D'Eredita, 2002). Consuming advertising content for educational or informational purposes has been identified as a gratification sought by consumers with high need for cognition, such as college students (Hallahan, 2008; Kwak, Andras, & Zinkhan, 2009; O'Donohue, 1994; Wang et al., 2002).

Purpose of the Study

Idealization in advertising has plagued industry ethicists for decades (Childs & Cater, 1954; Drumwright & Murphy, 2009; Gulas & McKeague, 2000). In an era when less than two percent of the population produces food and fiber for consumers with limited knowledge of and experience in the industry (Frick, Birkenholz, Gardner, & Machtmes, 1995; USDA, 2009), it is vital that commodity groups and other organizations understand the need for realism in product advertising. By propagating the "agrarian myth," the industry has opened itself to criticism from animal-rights and consumer advocates, who argue that such advertising qualifies as deceptive

and untrue, thus undermining agriculture's integrity in the eyes of the buying public ("Happy Cows," 2009; Meyer, 2009; Sherman, 2002). In order to protect agriculture's reputation and role in society, these groups should assess the content of their marketing and advertising material and find a happy medium between entertainment and education (Meyer, 2009).

The purpose of this study is to identify preferences for agricultural video content among a specific demographic: college students enrolled in General Education Curriculum (GEC) courses at a large Midwestern public university. The objectives of the study were:

1. To collect demographic information about the target population, including gender, age, academic major, and hometown;
2. To describe the affective response elicited by exposure to commercial advertising content—namely, the "Happy Cows" campaign—regarding perceived quality of dairy husbandry, likability, and realism; and
3. To compare participants' affective responses to the television campaign to those generated by images associated with modern dairy husbandry practices.

Methods

Subjects

The researchers sought a target demographic familiar with the "Happy Cows" campaign. Because undergraduate students between the ages of 18-30 watch an average of 2.5 hours of television per day and utilize television as a source of education and entertainment, they offered an ideal level of familiarity for the purposes of the study (Loechner, 2009; Student Affairs Administrators in Higher Education [NASPA], 2008). Participants self-selected into the study and were recruited from a population of students enrolled in three introductory GEC courses:

Introductory Biology, Introductory Chemistry, and Contemporary Issues in American Agriculture, a GEC writing course.

The goal of subject sampling was to develop a pool of varied ethnic and socioeconomic backgrounds. The campus from which the sample was collected reported a 14.4% minority student enrollment in 2009, and 19% of the 2008 freshman class were first-generation college students ("Ohio State," 2008; Kloeppel & Feder, 2009; "Statistical summary," 2009). Additionally, drawing a student sample from GEC courses allowed for a wide variety of academic majors, as those courses constitute the core curriculum required of all university students.

Instrument

The instrument selected for this study was an online questionnaire developed through survey engine SurveyMonkey.com. The researchers utilized the questionnaire to gather demographic information, including age, gender, description of hometown (urban, suburban, rural), and academic area of interest. Subjects described their television consumption in hours watched per day. Participants also described their uses and gratifications for television viewership by responding to 8 items regarding the "surveillance" and "entertainment" gratifications on a 5-point Likert-type scale (Table 2), with 1 indicating strong disagreement and 5 indicating strong agreement (Kang et al., 1999).

The questionnaire was also used to assess specific uses and gratifications related to television advertising consumption. Four of O'Donohue's (1993) advertising uses were selected as foci for the study: marketing uses information, surveillance, enjoyment, and self-affirmation.

During the survey, participants were asked to view five video clips linked to the questionnaire from video-sharing website YouTube. The first set of clips consisted of two videos

from the “Happy Cows” campaign (“Alarm Clock” and “April”) that presented images related to dairy housing. Subjects were then shown a clip featuring housing in the context of a tour of a large modern dairy farm. The third video shown was “Jenn,” a “Happy Cows” commercial depicting natural calf-rearing, which was followed by a second farm-tour video explaining how calves are raised on a large-scale dairy. For each video, subjects were asked to explain their initial reactions to the clips. Subjects then responded to statements on a 7-point semantic differential scale to rate the commercials as closer to one or the other of two bipolar adjectives. Participants judged the commercials on three dimensions:

1. Realism, or the congruence between what is presented in the video and the subject’s preconceptions of agricultural reality;
2. Likability, or the subject’s affective response to the commercials’ content; and
3. Quality of perceived animal treatment, or the nature of how animals are fed, housed, and cared for.

Data Analysis

To test validity, the questionnaire was pilot-tested in a GEC writing course with 47 students. Over one week, the questionnaire was emailed to students three times, resulting in 20 viable responses or a response rate of 44.68%. Cronbach’s alpha (α) was calculated as a statistical measure of reliability. Items measuring *surveillance* (α = .707) and *entertainment* (α = .975) as impetus for television consumption fared well on the reliability test. Scales measuring uses for viewing television advertising included *marketing uses* (α = .893), *surveillance* (α = .726), *enjoyment* (α = .69), and *self-affirmation* (α = .89). The three scales for video *likability*, *realism,* and *perceived quality of animal care* were also given a Cronbach alpha score. The Cronbach alpha for the *liking* scale was determined to be α = .846. The *realism* scale scored α =

.459 overall; the removal of one item raised this score to $\alpha = .549$. The scale for perceived *quality of animal care* received a Cronbach alpha score of $\alpha = .912$.

The general survey was conducted in two sessions: One round of surveys was sent to an introductory biology class of 604 undergraduate students during the last two weeks of the spring academic session. The second round of surveys was sent to an introductory chemistry class with an enrollment of 107 students during the first two weeks of the summer session. These efforts resulted in 56 valid responses. The responses to the pilot test were incorporated to the general survey for a total of 78 responses and a response rate of 9.72%.

Results

Of the 78 respondents, 57 reported their gender. Males constituted 45.6% of the sample ($n = 26$), and 54.4% of respondents ($n = 31$) were females. Respondent ages ranged from 18 to 41 years, with a mean age of 21.4 years and a mode of 20 years ($n = 16$). The majority of respondents (91.2%; $n = 52$) were under 24. Participants' hometowns were largely suburban (61.4%, $n = 35$), with rural-farming (19.3%, $n = 11$), rural-non-farming (10.5%, $n = 6$), and urban (8.8%, $n = 5$) trailing behind. The majority (82.2%, $n = 60$) of respondents who indicated their television viewing habits reported watching between 1-4 hours of programming per day.

Though the sample size was small, it was representative of the general population of undergraduate students at the university: The gender breakdown (45.6% male to 54.4% female students) skewed only slightly from the university population (51.9% male to 48.1% female students) ("Statistical summary," 2009). The sample also represented 13 colleges and the university's exploration program; most prevalent among those were social and behavioral sciences, which include psychology, sociology, communication, political science, and the

business college. Responses to class rank were fairly evenly distributed among the four categories: Of the 56 subjects who indicated their rank, 11 were freshmen (Rank 1), 18 were sophomores (Rank 2), 13 were juniors (Rank 3), and 14 were seniors (Rank 4).

Subjects were asked to respond to four Likert-type items to gauge their use of television for *surveillance* and *entertainment*, the two primary uses. The mean scores for those items were collapsed into composite means for each use. Respondents were slightly more likely to watch television for *entertainment* ($M = 3.84$) than *surveillance* ($M = 2.77$). To assess subjects' uses of television advertising, similar methods were used for *marketing uses* (six items) and *surveillance, entertainment*, and *self-affirmation* (three items each). Based on those scales, respondents use advertising for *entertainment* ($M = 3.13$) more than *marketing uses* ($M = 2.52$), *surveillance* ($M = 2.49$), and *self-affirmation* ($M = 2.33$).

Affective Responses Elicited by Exposure to the "Happy Cows" Campaign

The "Happy Cows" videos received an average *liking* score of 3.12, an average *realism* score of 3.49, and an average *quality of care* score of 3.61. Interestingly, a moderate positive correlation between was found between hometown types (with higher scores indicated less rural hometowns) and liking for the farm-tour videos ($r = .404$, $P = .004$). Viewers' initial reactions to the video echo the sentiment displayed in the statistics. Responding to the "Happy Cows" videos, subjects commented on the videos' entertainment value and eschewed the realism of their content. One participant wrote, "They were pretty cute commercials. If I were watching this on tv [sic] I'd probably remember those because of their humor. I was more focused on the humor and the animals though and nearly forgot it was [a] commercial for cheese or milk products." Another said that the commercials "are creative and I [sic] love the personification of the cows."

One respondent commented, “These clips are funny and amusing however they depict a false vision of the dairy industry. Many cows are not raised in old wooden barns today and I believe that the public should know this and why animals are raised this way.” More negative reactions included statements like “I am a vegetarian and loathe the commercial exploitation of animals” and “Cows cannot actually talk, so it is not a factual advertisement.” After watching the first farm-tour video, one respondent stated that “its [sic] harder to think that [the third commercial] is funny after knowing the truth about the cows.”

Affective Responses Elicited by Exposure to Farm Tour Videos

The farm tour videos scored 3.40 for *liking*, 4.51 for *realism*, and 3.87 for *quality of care*. A paired-samples *t* test for each variable indicated that while the difference between the video sets’ *liking* scores was not statistically significant ($t(47) = -1.76$, $P = 0.085$), the farm tour videos’ mean scores for *realism* and *quality of care* were significantly higher ($t(47) = -8.66$, $P = 0.001$and $t(43) = -2.99$, $P = .005$) than those for the television commercials. In their open-ended responses, subjects praised the videos’ “accurate and honest” depiction of dairying. Others called the videos “informative” and “realistic.” One respondent commented, “I would buy products from this company…Room for cows to lay down and the cows looked healthy. I liked this clip way better.” Similar comments included “it was good to see that animals were being treat[ed] humanely and were healthy” and “it is clear that they really do take care of these cows and treat them really well.”

Other respondents, however, noted that the free-stall housing and calf hutches seemed “crowded” and “unnatural” and doubted the humane treatment portrayed, especially the “smaaaaallll [sic] cages.” One stated, “I may have liked to see the cows outside the barn grazing.” Another wrote, “It was depressing to see them all being fed that dusty grain and being

so pressed together." One referred to the videos as "fake," and another said, "I now know how calves are cared for. I also kind of feel bad for them."

Discussion

Television and Advertising Uses and Gratifications

The results of this study strengthen the notion that young people consume television content and television advertising for entertainment purposes. Entertainment received the highest mean scores for both television viewership (M = 3.84) and advertising uses (M = 3.13). However, young people still watch televised programming for educational or informational purposes. The results of this survey reveal that media content aimed at informing audiences—versus selling a product—was as entertaining to participants as the advertisements featuring humanized dairy cattle (($t(47) = -1.76$, $P = 0.085$). Those participants from less rural backgrounds actually found greater enjoyment watching the informative farm-tour videos than those subjects with more regional familiarity with agriculture and dairy farming.

Responses to the "Happy Cows" and Farm-Tour Videos

Subjects analyzed both the television commercials and videos of the dairy farm tour on a 7-point adjective scale for *liking*, *realism*, and *quality of animal care*. The "Happy Cows" videos received moderate mean scores for all three qualities, ranging from 3.12 for *liking*, 3.49 for *realism*, and 3.61 for *quality of care*. The videos footage of a large modern dairy farm received mean scores of 3.40 for *liking*, 4.51 for *realism* (the highest score across all variables), and 3.87 for *quality of care*. The tour videos' scores for *realism* and *quality of care* were statistically higher than those for the "Happy Cows" videos.

The open-ended responses from participants compound the results of the survey items. Subjects indicated that the videos they deemed "more realistic"—the farm-tour videos—represented a more accurate portrayal of dairy husbandry than the commercials. Survey-takers were able to differentiate between modern and antiquated dairy husbandry practices, and they even preferred the modern methods of housing and calf care to the "freer" and "more natural" methods presented in the commercials. However, images of modern husbandry practices remained incongruent with several respondents' beliefs about humane animal treatment, indicating that today's methods continue to be at odds with traditional images of animal production.

Implications for Dairy Commodity Marketers and Advertisers

The results of this study support movement away from unrealistic, purely entertaining commercial content in favor of more informational, reality-based television advertisements. The college students surveyed indicated that they enjoyed watching videos featuring real footage of dairy farming as much as they enjoyed the humorous commercials featuring talking cattle. In fact, those students less familiar with agriculture reported greater liking for the more educational content. The researchers believe that educating the public about current trends in animal husbandry while marketing products is a more responsible way to promote both the commodity and its producers.

Socially responsible marketing practices are now being utilized by dairy marketing organizations, including the creators of the "Happy Cows" campaign. In 2010, CMAB debuted a new series of television advertisements based on the Real California Dairy Families documentary series. According to Vice President of Advertising Michael Freeman, the commercials "[dispel] the myth that California farms are run by cold, uncaring 'corporations'" and allow farmers to

debunk myths surrounding the dairy industry (Giambroni, 2009, para. 4). Similarly, the American Dairy Association Mid-East (ADA) organized a regional campaign in 2009 to promote Ohio dairy farmers and provide resources to consumers. ADA's advertisements feature interviews with producers and information on cow care practices, including hoof trimming and dehorning ("Campaign gives," 2010). To reduce respondent uncertainty about the purpose of the each video set in subsequent studies, investigators could screen commodity advertisements that contain more realistic content. CMAB's and ADA's new television spots would be ideal as they represent the same entity with vastly different visual and emotional appeals.

Though limited in scope to undergraduate students, the results of this study shed light on the advertising-content preferences of an important group of future consumers. In 2009, more than 70 percent of American high school graduates were enrolled in colleges and universities, the latest high point in an upward trend among young people ages 16-24 (Bureau of Labor Statistics [BLS], 2010a). These students also comprise an important part of the nation's consumer market: More than half of undergraduates contributed to the labor force in 2009, and college graduates experience better employment opportunities, higher earnings, and more discretionary spending than non-graduates (BLS, 2010b; Roberts & Jones, 2001). Appealing to an educated consumer demographic could be beneficial to organizations seeking to improve both their bottom line and the public image of their commodities.

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