

Water Conservation and Climate Change: Using Cognitive Dissonance to Engage the Public

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Abstract

This study sought to explore the relationship between citizens' beliefs, attitudes and behaviors regarding water conservation and their knowledge and beliefs regarding climate change to guide the development of effective communication campaigns focused on water conservation. Using cognitive dissonance theory and Martinsson and Lundqvist's (2010) environmental attitudes and behavior quartet, this study focused on individuals who demonstrate high levels of climate change knowledge but do not engage in positive water conservation behaviors. These individuals were found to hold different perspectives on climate change from the general public. They believed climate change was real and caused by humans but are doing little to curb their personal water use and are not taking personal action to mitigate the effects of climate change. This study also explored the best sources to use in reaching these individuals.

Key words: Water use, climate change, cognitive dissonance

Introduction

Public opinion about climate change has varied in the United States (U.S.) from those who believe to those who deny it is occurring despite an overwhelming agreement in the scientific community (Donner & McDaniels, 2013). Scientists have confirmed that climate change is real, it is happening now, and humans are playing a large role (Liu, Vedlitz, Stoutenborough, & Robinson, 2015). Research has shown individual attitudes about climate change are influenced by many factors including personal values, political ideology, current events, media coverage, and risk perception (Donner & McDaniels, 2013). The discrepancy between public opinion and scientific evidence has generated concern given the public makes everyday choices about their use of natural resources including water, which is affected a great deal by climate change (Guy, Kashima, Walker, & O'Neill, 2014). While the planet warms, the hydrological cycle will intensify causing wet regions to get even wetter and dry regions drier (Famiglietti, 2016). The Intergovernmental Panel on Climate Change ([IPCC], 2013) is highly confident that the contrast between wet and dry regions and wet and dry seasons will increase over most of the world.

Areas affected by drought have become the most concerning. In the last decade, there has been an increased interest and attention towards water security, reflected in the numerous publications, research, and funding initiatives focused on the topic (Pahl-Wstol, Gupta, & Bhaduri, 2016; Bakker, 2012; Cook & Bakker, 2012; UNESCO-IHE, 2009; World Economic Forum, 2011). Experts predict that by 2050 one-third of all U.S. counties will face water scarcity (Spencer & Altman, 2010). The length and location of droughts have increased due to climate change, and this trend is projected to continue into the future (Burke, Brown, & Christidis,

2006). In addition, global demands on water continue to rise due to population increases, agricultural needs, and industrial demands (Kingsolver, 2010). Water supports human life, sustains the ecological balance, and supports economic activities around the world (Hurlimann, Dolnicar, & Meyer, 2009); therefore, it must be protected. People have the ability to witness the direct effect climate change has on water, and water issues associated with climate change are garnering a great deal of public attention.

Unfortunately, the scientific community has not fully and effectively communicated the science behind climate change and its link to water resources to the general public (Liu, Smith, & Safi, 2014). When scientists discuss climate change they often refer to a set of complex variables and topical areas, which may include ocean levels, temperature, annual rainfall, and atmospheric pressure (Werndl, 2015), that seem ambiguous to the general public and not something they are directly impacting with their behaviors. However, Martinsson and Lundqvist (2010) found that knowledge levels of climate change did impact their respondents' attitudes towards water conservation and guided individual water conservation behavior engagement.

Agricultural communicators have encouraged communities to implement water conservation solutions for the sake of saving water for the future (Gorham, Lamm, & Rumble, 2014; Lenton & Muller, 2009; Warner, Rumble, Martin, Lamm, & Cantrell, 2015). However, most water conservation practices occur at the individual level, and factors that lead to positive water conservation attitudes have proven to be difficult to measure (Lamm, Lamm & Carter, 2015; Leal, Rumble, & Lamm, 2015; Taylor & Lamm, 2016). Communication campaigns focused on future water supply levels with an emphasis on climate change may assist in the promotion of the water conservation behaviors necessary to ensure communities have the water they need in the future (Evans et al., 2015). Agricultural communicators may be able to increase

water conservation behavior engagement by focusing on communicating about climate change, a topic often overlooked or avoided in water discussions. Therefore, this study explores the connection (or disconnect) between public beliefs and attitudes about water conservation and individuals' knowledge and beliefs regarding climate change to guide the development of effective communication campaigns focused on water conservation.

Conceptual Framework

The theory of cognitive dissonance suggests individuals tend to feel uncomfortable when their behavior and beliefs contradict one another (Festinger, 1957). Cognitive dissonance (Festinger, 1957) guided the development of a conceptual framework for this study, which sought to understand the disconnect between individuals holding a high level of climate change knowledge and yet not engaging in positive water conservation practices. Martinsson and Lundqvist (2010) stated “the importance of consistency in the environmental field and the amount of dissonance produced by behaving inconsistently has been found to depend on the person’s moral standards for environmentally responsible behavior” (p. 522). Furthermore, Thøgersen (2004) found that individuals often self-report dissonant environmental behaviors because they fail to perceive the relevant similarity between the behaviors (example: buying organic and recycling). He advocates for communicating to citizens the environmental significance of daily behaviors.

When it comes to climate change people typically begin in a state of disinterest about the climate and exhibit little or no interest in changing their behavior (Markowitz & Doppelt, 2009). This tends to be caused by a lack of information and the idea that individual behaviors will do little to mitigate the global situation (Markowitz & Doppelt, 2009). Therefore, providing individuals with knowledge about climate change, and their personal role in climate change, may

enable them to make the decision most suitable to their beliefs and behaviors. Based on previous research, “environmental choices are not reflective of a general conservation stance, but are instead made on an activity-to-activity basis” (Picket, Kangun, & Gorge, 1993, p. 240).

Additionally, studies have shown cognitive dissonance-inducing messages can produce behavior that is environmentally friendly (Aitken, McMahon, Wearing, & Finlayson, 1994).

A conceptual framework was introduced by Martinsson and Lundqvist (2010) that identified individuals who practice green habits and whether or not those practices correlated with their attitudes toward the environment. Green habits are defined as behaviors that seek to limit an individuals’ ecological footprint (Dobson, 2007). Martinsson and Lundqvist (2010) created an environmental attitudes and behavior quartet. This quartet can be used to identify four possible combinations of attitudes and behaviors. Two of these groups show consistent attitudes and behaviors, while the remaining groups exhibit inconsistent patterns leading to cognitive dissonance. The conceptual framework was adapted to address climate change for this study and can be seen in Figure 1.

Conservation Behaviors	<p>Coverts</p> <p><i>Individuals holding low levels of climate change knowledge but exhibit positive conservation practices</i></p>	<p>Believers</p> <p><i>Individuals holding high levels of climate change knowledge and exhibit positive conservation practices</i></p>
	<p>Diehards</p> <p><i>Individuals holding low levels of climate change knowledge and do not exhibit positive conservation practices</i></p>	<p>Hypocrites</p> <p><i>Individuals holding high levels of climate change knowledge but do not exhibit positive conservation practices</i></p>

Climate Change Knowledge

Figure 1. Climate Change Quartet Conceptual Framework (adapted from Martinsson and Lundqvist, 2010)

Combinations of climate change knowledge and conservation behavior engagement within the conceptual framework lead to four theoretical categories of individuals in terms of environmental attitudes and conservation behaviors: Believers, Diehards, Hypocrites and Coverts (Martinsson & Lundqvist, 2010). Believers are identified as those who possess high levels of climate change knowledge and exhibit positive water conservation behaviors. Believers reflect consistency when it comes to their attitudes and behaviors (Martinsson & Lundqvist, 2010). In this case, Believers believe climate change is happening and influenced by humans. They are also practicing positive water conservation behaviors and actions. Diehards also exhibit consistency between knowledge and behaviors however, these individuals hold low levels of knowledge of climate change and do not exhibit positive water conservation behaviors (Martinsson & Lundqvist, 2010). Diehards typically act with a disregard towards climate change and water conservation behaviors.

On the other side of the model there are two categories with inconsistencies between beliefs and behaviors. One is the Hypocrites. Hypocrites express high levels of climate change knowledge but do not engage in positive water conservation behaviors. This group exhibits a high level of cognitive dissonance. Hypocrisy is not uncommon in the realm of conservation behavior. Acxiom (2009) found that while 93% of French Internet users were concerned about environmental issues, only 38% adopted conservation behaviors. This discrepancy can produce behavioral changes, especially when the relation between knowledge and behavioral actions is deemed hypocritical (Rubens, Gosling, Bonaiuto, Brisbois, & Moch, 2015; Dickerson, Thibodeau, Aronson, & Miller, 1992). Researchers have even purposefully induced hypocrisy in order to examine its ability to change intentions and behaviors (Priolo, Milhabet, Codou, Fointiat, Lebarbenchon, & Gabarrot, 2016; Aronson, Fried, & Stone, 1991).

The last group is the Coverts, who engage in water conservation behaviors but have low levels of climate change knowledge (Martinsson & Lundqvist, 2010). This group also exhibits a high level of cognitive dissonance in relation to their knowledge and behaviors and are most likely engaging in water conservation behaviors for reasons other than climate change.

Purpose and Objectives

The purpose of this study was to identify the characteristics and traits of Hypocrites, or respondents that display cognitive dissonance related to climate change and water conservation, in the general public to inform agricultural communication initiatives that could target this audience. The research was driven by the following objectives:

1. Identify Hypocrites based on individuals' level of climate change knowledge and level of engagement in water conservation behaviors;
2. Describe the demographic characteristics of Hypocrites.
3. Describe Hypocrites' perspectives on climate change.
4. Describe Hypocrites' level of engagement in water conservation behaviors.
5. Identify the sources Hypocrites use to get information about water issues.

Methods

The research presented here was part of a larger research project with four sections germane to the objectives of the study. The researchers used a Web-based survey that included several elements from already existing, reliable instruments including the Canadian water attitudes survey (Patterson, 2012), a survey used with Centers for Disease Control and Prevention health professionals in Shanxi, China (Wei et al., 2014), and the American Knowledge of Climate Change survey (Leiserowitz, Smith, & Marlon, 2010).

To measure levels of climate change knowledge, we used a scale consisting of 11 statements where respondents were asked to indicate whether each statement was true or false (Leiserowitz et al., 2010). For every correct answer the respondents were given a score of one and an incorrect answer was given a zero. The responses were summed to create an overall climate change knowledge score ranging from zero to 11 ($M = 7.20$ $SD = 2.48$). To identify perspectives on climate change, respondents were asked to select which of the three statements they personally believed: 1) climate change is happening now, caused mainly by human activities, 2) climate change is happening now, caused mainly by natural forces, and 3) climate change is NOT happening.

To measure water conservation behavior engagement, respondents were asked to respond to two sets of statements. The first set contained 11 statements pertaining to water conservation activities where respondents were asked to indicate how often they engaged in each behavior on a five-point Likert scale ranging from 1 = *Never*, 2 = *Almost never*, 3 = *Sometimes*, 4 = *Almost every time*, and 5 = *Every time*. Example statements included: “I shower for no more than five minutes each time I bathe,” “I let me sprinklers run when it has rained or is raining,” and “I allow used motor oil to run down a storm drain.” The second set contained six statements asking respondents to indicate whether or not they engaged in water conservation behaviors by answering “yes” or “no” to each statement. Example statements included “I have low-flow shower heads installed in my home,” “I have water-efficient toilets installed in my home,” and “I have low-water consuming plant materials in my yard.”

A total engagement score for water conservation behaviors was assigned to each respondent by adding up the number of positive behavior experiences they reported. For the first set of statements, those who answered “almost every time” or “every time” received one point.

Three of these statements were reverse coded to reflect a positive answer: “I turn off the water every time I brush my teeth,” “I avoid watering my lawn in the summer,” and “I shower for no more than five minutes each time I bathe.” From the second set, each “yes” response was give one point as well. The responses were summed to create an overall score ranging from zero to 16 ($M = 7.20$, $SD = 3.45$).

Finally, respondents were asked to identify where they received information about water issues in the U.S. Respondents were given a list of 13 possible information sources and allowed to check all that applied. Those sources included newspaper, social media, Internet, magazine, farming organizations, family/friends, attending events/activities, governmental websites, self-observation, television, radio, other, or none of the above. Prior to distribution, a panel of experts reviewed the survey instrument for internal validity. The panel included an Assistant Professor and Extension Specialist in Water Economics and Policy, the Director of the [Center], and an Assistant Professor for the [Center] specializing in survey methodology.

The population of interest was U.S. residents aged 18 or older. Non-probability opt-in sampling techniques were used. A third party public opinion research company, Qualtrics, distributed the survey by sending a link to 2,703 U.S. residents. Respondents had to meet certain criteria based on the sampling procedure to enter the survey and pass a series of quality checks to complete the survey to ensure cognitively responsive results. After criteria-based selection and quality assurance a 42% participation rate was obtained ($N = 1,137$). Demographic questions were included in the survey instrument to ensure the collected sample reflected the U.S. adult population and were geographically representative of the nation. In addition, the data were weighted using the 2010 U.S. Census for age, gender, and race/ethnicity to ensure the respondents were representative of the population of interest (Kalton & Flores-Cervantes, 2003).

This is a common procedure when using non-probability sampling to ensure accuracy and alleviate the impacts of selection, exclusion, and bias (Baker et al., 2013). The results were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 and Excel.

Results

Scores for the climate change knowledge questions were averaged to create an overall climate change knowledge index that could range from zero to 11. Based on the climate change index mean score of 7.20, a response of seven or higher indicated a high level of climate change knowledge (Table 1). Next, an overall water conservation index was created ranging from zero to 16. Based on the water conservation behavior index mean score of 7.2 a response of six or lower indicated the respondent exhibited negative conservation behaviors. Respondents with high levels of climate change knowledge and poor water conservation behaviors were labeled Hypocrites. The 262 respondents that fell into this category were used for further analysis.

Table 1
Climate Change Quartet

	Knowledge Quiz ^a <i>M (SD)</i>	Water Conservation Behaviors ^b <i>M (SD)</i>
Believers (<i>n</i> = 449)	8.88 (1.35)	9.77 (1.97)
Hypocrites (<i>n</i> = 262)	9.21 (1.38)	3.82 (1.71)
Coverts (<i>n</i> = 234)	4.31 (1.72)	9.36 (1.86)
Diehards (<i>n</i> = 191)	4.25 (1.65)	3.62 (1.94)

Note. ^aScale ranged from 0 = *no knowledge* to 16 = *complete knowledge*; ^bScale ranged from 0 = *no engagement* to 11 = *complete engagement*.

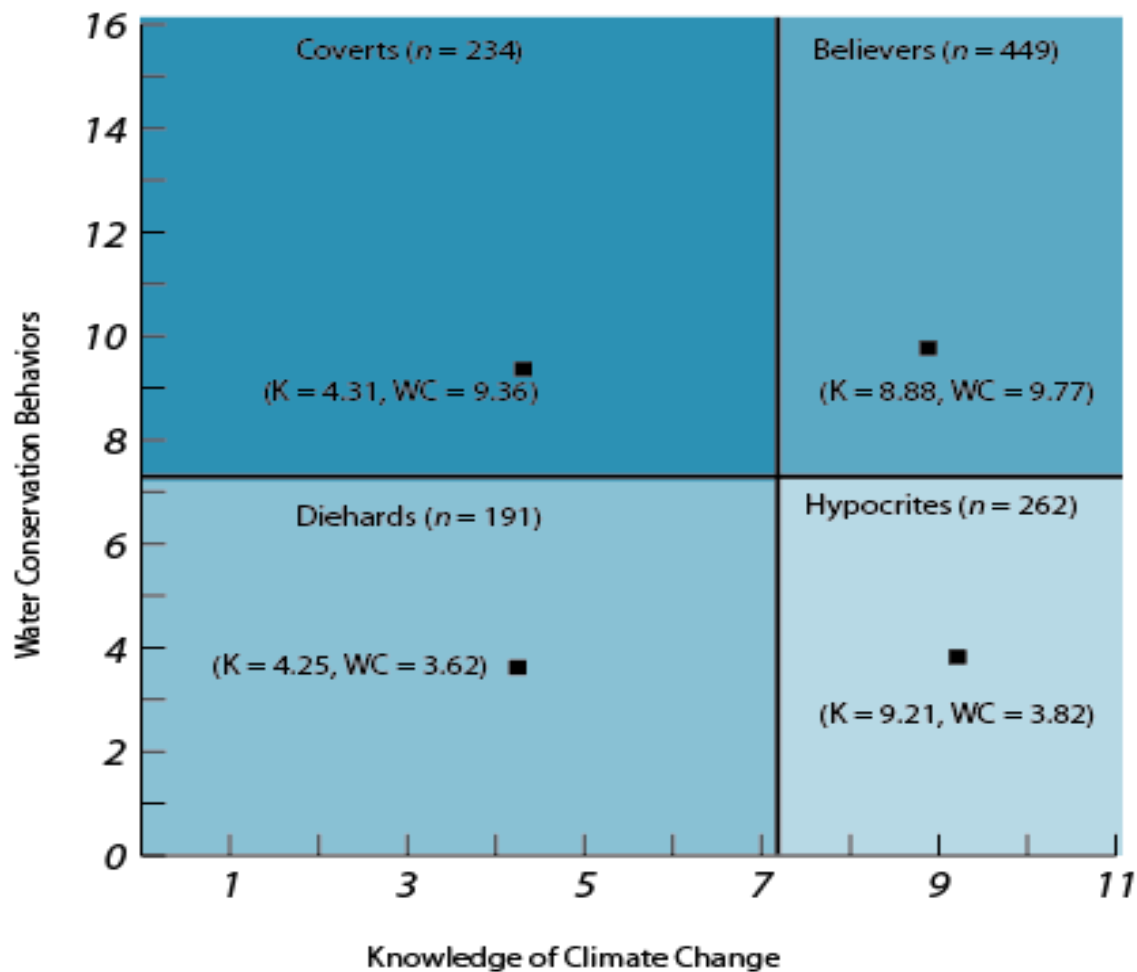


Figure 2. Environmental Citizen Quartet

Description of Hypocrites

The Hypocrites were more likely to be female (53.7%) than the overall respondents. In addition, Hypocrites were more educated than the general population with 45.1% having at least a 4-year college degree or a Graduate/Professional degree compared to 38.6% of the overall respondents. There were also more Hispanic (16.4%) Hypocrites than overall respondents. Hypocrites were more likely to report being liberal or very liberal (33.8%) compared to the overall respondents (28.3%) and were younger (Table 2).

Table 2
Demographics of Overall Respondents and Hypocrites

	Overall	Hypocrites
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	(N = 1,137) %	(n = 262) %
Sex		
Female	51.2	53.7
Male	48.8	46.3
Education		
Less than 12 th grade	1.9	1.0
High School/GED	21.9	16.2
Some college, no degree	24.9	24.6
2 year college degree	12.7	13.0
4-year college	25.1	29.6
Graduate/Professional degree	13.5	15.5
Race		
White	66.9	64.2
Black	11.6	9.7
Asian or Pacific Islander	5.0	7.6
Multiracial	5.0	3.4
Native American	0.7	0.0
Other	14.4	15.1
Hispanic Ethnicity	12.1	16.4
Political Beliefs		
Very Liberal	9.2	8.0
Liberal	19.1	25.8
Moderate	45.5	53.2
Conservative	18.6	11.0
Very Conservative	7.6	1.9
Political Affiliation		
Republican	27.3	22.4
Democrat	37.2	40.7
Independent	25.6	22.7
Non-Affiliated	9.5	14.1
Other	.4	.2
Age		
20-29	18.2	27.5
30-39	17.1	22.3
40-49	18.6	16.0
50-59	17.9	11.9
60-69	12.5	10.5
70-79	7.1	4.3
80+	8.7	7.5

Hypocrites' Perception of Climate Change

Compared to the overall population, Hypocrites were more likely to believe climate change is happening now and caused mainly by humans. Of the overall population surveyed,

61.9% believed that climate change was caused mainly by humans compared to 81.1% of Hypocrites who believed that humans were the cause. There was a much lower perception of Hypocrites believing that climate change was caused by natural forces (15.9%) or not happening at all (3.0%) compared to the overall public (Table 3).

Table 3
Perceptions of Climate Change

	Overall (<i>N</i> = 1,137) %	Hypocrites (<i>n</i> = 264) %
Climate change is happening now, and caused mainly by humans	61.9	81.1
Climate change is happening now, caused mainly by natural forces	29.9	15.9
Climate change is not happening now	8.1	3.0

Hypocrite Engagement in Water Conservation Behaviors

Respondents were asked to identify their level of engagement in water conservation behavior efforts with a series of 16 statements. The first ten statements represented water conservation actions. The highest reported negative water conservation actions were showering for more than five minutes each time they bathe (51.5%), leaving the water running in the kitchen while washing dishes (45.1%), never turning off the water while brushing teeth (31.8%), and watering the lawn in the summer (29.0%) (Table 4).

Table 4
Hypocrites Engagement in Water Conservation Actions (n = 264)

	Never/ Almost Never %	Sometimes %	Almost Every Time/ Every Time %
I shower for no more than five minutes each time I bathe	51.5	22.8	25.7
I leave the water running in the kitchen when washing or rinsing dishes	25.7	29.1	45.1
I turn off the water while brushing my teeth	31.8	25.0	43.2
I avoid watering my lawn in the summer	29.0	50.6	20.9

I allow soapy water to run down a storm drain	36.5	37.8	25.7
I allow oil from cooking to run down the drain	26.6	28.4	14.0
I let my sprinklers run when rain is predicted in the forecast	69.2	19.5	11.3
I let my sprinklers run when it has rained or is raining	80.3	14.4	5.4
I allow used motor oil to run down a storm drain	89.1	6.1	4.8
I hose down my driveway	64.9	32.7	2.5

The second series of questions focused on water conservation behaviors. The highest reported behaviors included respondents were not doing include the following: using recycled wastewater/reclaimed water to irrigate lawns (97.5%), using rain barrels to collect water for use in garden or lawn (97.5%), donating money to a nonprofit to provide drinking water to another country (94.0%) and having low-water consuming plant materials in their yard (87.6%). These results are shown in Table 5.

Table 5
Hypocrites Engagement in Water Conservation Behaviors (n = 264)

	Yes %	No %
I use recycled wastewater/reclaimed water to irrigate my lawn/landscape	2.5	97.5
I use rain barrels to collect water for use in my garden/lawn	2.5	97.5
I have donated money at least once in the past five years to a nonprofit that works to provide access to drinking water in another country.	6.0	94.0
I have low-water consuming plant materials in my yard	12.4	87.6
I have low-flow shower heads installed in my home	29.0	71.0
I have water-efficient toilets installed in my home.	39.5	60.0

Sources Hypocrites Use to Get Information about Water Issues

Respondents were asked where they retrieved their information about water. The results from the Hypocrites are displayed in Table 6. Hypocrites were most likely to obtain their information about water issues from the Internet, television, or social media.

Table 6
Sources Hypocrites use to get Information about Water Issues (n = 264)

	%
Internet	65.8

Television	60.0
Social Media	42.4
Newspaper	38.6
Family and Friends	25.9
Self-Observation	23.0
Radio	19.0
Governmental Website	9.9
Magazine	8.7
Farming Organization	1.6
Attending Events/Activities	2.0

Conclusion

This study sought to identify the Hypocrites who believed climate change was real and influenced by humans but were not practicing water conservation behaviors so potential cognitive dissonance could be addressed with targeted agricultural communication campaigns. Demographically, the findings revealed Hypocrites were younger, liberal females who are highly educated. These results are comparable with similar studies that focused on environmental conservation in general, which revealed that focusing on climate change specifically does not alter the target Hypocrite audience and that all environmental educational initiatives can be targeted towards this audience (Liu et al., 2014; McCright & Dunlap, 2011; Milfont, Milojeve, Greaves, & Sibley, 2015).

In addition, Hypocrites' perspectives on climate change differed from the general public. They believe climate change is real and caused by humans but are doing little to curb their personal water use and are not taking personal action to mitigate the effects of climate change. For example, Hypocrites are likely to allow cooking oil to run down the drain, a serious water quality issue, and allow the faucet to run while brushing their teeth. Both of these behaviors are simple to alter. In addition, a large percentage are also watering their lawn after it rains or if rain is predicted, are not reducing their showering time, and are leaving the faucet running while doing dishes. Because these behaviors are those where the largest impact can be made,

agricultural communication materials should focus on trying to alter these targeted behaviors. Based on cognitive dissonance theory (Festinger, 1957), hypocrites should want to adjust their behavior to more closely align with their beliefs so targeted communication efforts to the younger, liberal, more highly educated population should have the largest effect.

The finding also show a majority of Hypocrites are getting their information about water issues from the Internet and television. Agricultural communicators should consider using targeted social media campaigns during times of water restriction. Attention is already paid to water issues and the media buzz can be leveraged to encourage specific behavior engagement. Social media outlets, such as Facebook, can target campaigns to specific users. Agricultural communicators should consider utilizing these avenues to send specific messages about minimizing shower time, shutting off the faucet when brushing teeth, and minimizing water use when washing dishes. They may want to consider partnering with organizations whose websites or social media outlets are visited by a younger, liberal clientele in an effort to reach Hypocrites specifically. Hypocrites can become Believers if steps are taken to encourage them to correct inconsistencies between their beliefs and actions (Martinsson & Lundqvist, 2010).

Water issues related to climate change are becoming a priority for many states. Future research could be conducted to further understand why the public does not believe in or understand climate change and how to leverage climate change knowledge to alter behavior. An in-depth analysis of Hypocrites specifically may provide additional, powerful data on how to access and initiate change within this audience. A qualitative approach including utilizing focus groups or in person interviews with Hypocrites in different regions of the U.S. to further understand if there are regional differences and how Hypocrites want to be communicated with about climate change and water conservation behavior engagement is suggested. Communication

materials, including the social media messages recommended earlier, could also be tested using experimental designs with Hypocrites to identify which would be best to utilize broadly to encourage behavior change.

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Crowdsourcing change: An analysis of Twitter discourse on food waste and reduction strategies

Research paper

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Abstract

Food waste has emerged as a major issue in the United States as the nation collectively sends more than 133 billion pounds of food to its landfills every year. In September 2015, the USDA and EPA announced an initiative to cut U.S. food waste in half by 2030. Between 2015 and 2016, nearly 100,000 posts about food waste have been published on Twitter, a microblogging platform that has been a hub of “slacktivism” since its inception in 2006. Using a conceptual framework of social cognitive theory, online activism, and crowdsourcing, we analyzed food waste conversation participants’ demographics, online communities, and proposed solutions. Data analysis was conducted with listening software Sysomos MAP and a qualitative content analysis of conversation content. The analysis revealed that more than 2,000 U.S. users engaged in the conversation, forming four discrete conversation communities led by influencers from government, news media, and environmental organizations. Proposed solutions to the food waste crisis included domestic or household behavior change, food-waste diversion and donation, recycling and upcycling, consumer education, and governmental action and policy. We recommend using Twitter to mine, test, and deploy solutions for combating food waste; engage with influential users; and disseminate materials for further research into the behavioral implications of online activism related to food waste.

Keywords: Social media; food waste; online activism; crowdsourcing; influence

Crowdsourcing Change: An Analysis of Twitter Discourse on Food Waste and Reduction Strategies

Introduction/Purpose

“Food waste is like the band Rascal Flatts: It can fill a surprising number of football stadiums even though many people consider it complete garbage.”

So quipped the eponymous host of *Last Week Tonight with John Oliver*, HBO’s late-night news program, in a 17-minute-long segment aired on July 19, 2015 (Saad, 2015, para. 5). Oliver’s seriocomic takedown of the United States’ food waste crisis was viewed live by 1.04 million people (Bibel, 2015) and went viral online, having been played more than 6.8 million times on YouTube (LastWeekTonight, 2015) by September 2016.

The show brought to public attention the vast amount of waste generated by the production, manufacturing, and consumption of foodstuffs in the United States. Americans collectively throw away some 133 billion pounds of food, or one-third of the nation’s food supply (Moodie, 2015; USDA, 2015), leading to hundreds of billions of dollars’ worth lost to landfills and costing U.S. consumer households approximately \$936 per year (Buzby & Hyman, 2012). In response to these damning statistics, federal agencies vowed to tackle the issue head on. On September 16, 2015, the United States Department of Agriculture (USDA) and Environmental Protection Agency (EPA) announced an initiative to reduce U.S. food waste by 50 percent over a 30-year period (USDA, 2015).

John Oliver’s segment seems to have been a catalyst for online discussion about the U.S. food waste problem. The hashtag #foodwaste began trending on Twitter within hours of the show’s airing (Sanderson, 2015), indicating a sharp uptick in conversation on the social-media platform. Twitter, a microblogging tool, has been identified as a means of influencing users’ perceptions of and subsequent behaviors toward topics ranging from health and wellness to

social justice (Kende et al., 2016; Moscato, 2016; Centola, 2013; Korda & Itani, 2013) since its launch in 2006 (“Twitter milestones,” n.d.). Because of social media’s power to influence—as well as their ubiquity—they are increasingly being harnessed to advance the human condition. In the realm of health promotion, researchers have leveraged Twitter and other social media platforms to encourage habits that improve individual and collective wellbeing. In a meta-analysis of health-promotion research, Korda and Itani (2013) identified social-media and Web interventions applied to weight loss, cessation of tobacco-product use, and increasing physical activity. Evidence suggests that these platforms empower and engage patients by building online “communities” (Korda & Itani, 2013; DeBar et al., 2009).

Twitter has also been studied as a potential *predictor* of real-world collective behavior: Abbasi et al. (2012) note that researchers have found strong correlations between Twitter sentiment and stock market trends (Bollen, Mao, & Zeng, 2011) and Twitter discussion and films’ box-office earnings (Asur & Huberman, 2010). Calling social media a form of “collective wisdom” (p. 492), Asur and Huberman (2010) analyzed “tweet-rates,” or the number of tweets referring to a film posted per hour, in relation to opening-week earnings. Their study reported a positive and predictive relationship ($r=0.90$; $R^2=0.80$) between tweet-rate and movies’ box-office receipts.

Social media are important agents for change in an increasingly computer-mediated communications environment. Undertaking this research, we sought a deeper understanding of how perceptions and behavior change regarding food waste were promoted via Twitter. The purpose of this study, therefore, was to describe the social-media conversation surrounding the U.S. food waste crisis in the wake of the USDA’s announcement of its food waste reduction initiative. We outlined the following research objectives to guide the study:

RO1: To describe the demographic and psychographic characteristics of Twitter users engaged in food waste-related discussions;

RO2: To identify communities of Twitter users engaged in food waste related discussions and influential members of those communities; and

RO3: To describe specific solutions to the food waste crisis produced or shared by those users.

To address these objectives, we constructed a conceptual framework that includes social cognitive theory, online activism, and crowdsourcing.

Social Cognitive Theory and Collective Agency

Albert Bandura's social cognitive theory posits that individuals' attitudes, beliefs, and behaviors are influenced, but not caused by, "personal factors in the form of cognitive, affective, and biological events, behavioral patterns, and environmental events" (Bandura, 2001a, p. 266)—that is, people possess the agency necessary to make decisions within the context of their sociocultural milieu. According to Bandura (2001b), "To be an agent is to intentionally make things happen by one's actions. Agency embodies the endowments, belief systems, self-regulatory capabilities and distributed structures and functions through which personal influence exercised" (p. 2). Exposure to social media can influence individuals' perceived personal agency:

The revolutionary advances in electronic technologies have transformed the nature, reach, and loci of human influence. These new social realities provide vast opportunities for people to bring their influence to bear on their personal development and to shape their social future. (Bandura, 2001b, p. 17)

As individuals become empowered to make decisions, so too can *groups* of individuals (Bandura, 2001a; 2001b; 1997). Collective agency, "people's shared belief in their collective

power to produce desired results,” is the product of “the interactive, coordinated, and synergistic dynamics of their transactions” (Bandura, 2001a, p. 13). Collective agency relies on environmental factors, including the agency of the group’s individual members:

The more efficacious groups judge themselves to be, the higher their collective aspirations, the greater their motivational investment in their undertakings, the stronger their staying power in the face of impediments, the more robust their resilience to adversity, and the higher their performance accomplishments. (Bandura, 2001b, p. 270)

Citizen Participation and Social Media

Social media have in some ways democratized mass media, increasing both the personal and the collective agency of individual media users. Ordinary citizens can now participate in the broad dissemination of information within society, a task formerly reserved by news outlets and broadcast networks. This empowerment of individuals has led to the advent of online activism, or the use of social media and other Web platforms to promote social change via “fundraising, community building, lobbying and organizing” (Lee & Hsieh, 2013, p. 818). Sometimes dubbed “slacktivism” or “hashtag activism” by critics (Fatkin & Lansdown, 2015; Moscato, 2016), this form of citizen participation is able to “leverage audience interest to amplify messaging. Retweeting, for example, allows a movement’s members not present at an event or rally to still participate in the distribution of information and thus the shaping of public opinion (Moscato, 2016, p. 5; Penney & Dadas, 2014). Online activism is low-cost, low-risk, and low-effort, allowing more individuals to participate (Lee & Hsieh, 2013).

Despite some concerns that online activism reduces real-world collective action, the use of social media to encourage change may in fact encourage prosocial behavior. Lee and Hsieh (2013) found that “slacktivism” actually increased the likelihood of individuals engaging in

charitable activities: After signing an online petition, study participants were more likely to donate to a charity than their peers who were not asked to sign the petition. Online activism, therefore, may act as a priming activity that promotes prosocial behaviors outside the confines of a social-media platform. Likewise, Fatkin and Lansdown's (2015) findings suggest that social media coverage of natural disasters can spur prosocial collective action, including charitable donations to aid organizations and actual involvement in rescue and recovery efforts.

Crowdsourcing

In 2006, *Wired Magazine* writer Jeff Howe used the term "crowdsourcing" to describe labor—in this case, photography—previously completed by trained professionals that had been overtaken by the work of technologically savvy amateurs. Crowdsourcing is a "web-based business model that harnesses the creative solutions of a distributed network of individuals" (Brabham, 2008, p. 76). Unlike outsourcing, which takes advantage of lower costs by exporting labor, crowdsourcing takes advantage of the "hobbyists, parttimers, and dabblers [who] suddenly have a market for their efforts, as smart companies in industries as disparate as pharmaceuticals and television discover ways to tap the latent talent of the crowd" (Howe, 2006, p. 2).

Crowdsourcing takes a variety of forms, including crowd funding, crowd labor, crowd research, and creative crowdsourcing (Parvanta, Roth, & Keller, 2013). Creative crowdsourcing, which Parvanta et al. (2013) link to endeavors like Pillsbury's famous bake-off, may be used by private or public entities to brainstorm new products, services, or ideas from large audiences. The formula is relatively simple: "A problem, or creative brief, is posted online, and Internet users are challenged to respond with their best work" (Parvanta et al., 2013, p. 165). Brabham (2008) describes the creative process as "collective intelligence," noting that the Internet is an

ideal vehicle for “aggregating millions of disparate, independent ideas in the way markets and intelligent voting systems do” (p. 80).

Using this conceptual framework, this study will outline the convergence of collective agency, online activism, and creative crowdsourcing in the context of Twitter-mediated food waste discussion and solution generation.

Methods

The research team undertook this study to describe the Twitter conversation surrounding food waste in the United States following the USDA’s announcement of its food waste reduction initiative in September 2015. The study consisted of a qualitative content analysis of food waste-related Twitter content, as well as an analysis of participant demographics, communities, and influencers.

Data Collection

Researchers undertook data collection using the subscription service Sysomos Media Analysis Platform (MAP), a “listening” tool that allows users to identify, analyze, and archive social media, news media, blog, and video content related to keywords, hashtags, and individual pages or users. Agricultural communications scholars have previously used Sysomos MAP and other similar platforms to investigate conversations regarding water quality, foodborne illness, and extreme weather events (Seeloff & Specht, 2016; Wickstrom & Specht, 2016; Wagler & Cannon, 2015). The Sysomos MAP search function uses Boolean queries to identify content containing the search terms and also allows the user to refine results based on demographic information (geographic location, user gender) or specific timelines. For this study, the query

“food waste” was used, with results narrowed to content posted in the United States between October 1, 2015 and September 1, 2016.

The Sysomos service has access to the Twitter Firehose, or a 365-day archive of all public Twitter content. Users can download Twitter content in the form of comma-separated variable (.csv) spreadsheets; this data can be drawn in order of posting or randomly sampled by Sysomos MAP. The “food waste” search resulted in 90,391 tweets, a random sample of 3,000 of which were downloaded in .csv format and opened in Microsoft Excel 2011 for Mac for further filtering. A preliminary review of the data found 1,967 tweets that were not relevant to the search at hand, that had been deleted, or that teased but did not directly suggest a solution; these tweets were eliminated from the data set. The final spreadsheet was then saved in Microsoft Excel format and uploaded into MAXQDA12, a content-analysis tool.

Data Analysis

Content analysis. Once opened in MAXQDA12, the resulting data set was content-analyzed for proposed solutions or mechanisms for alleviating the U.S. food waste crisis. Content analysis is a common tool for social media studies, being “beneficial in capturing patterns and themes in large amounts of data” (Fatkin & Lansdown, 2015, p. 582). We conducted a systematic thematic analysis, or a search for important emergent themes related to a particular phenomenon (Fereday & Muir-Cochrane, 2006; Daly, Kellehear, & Gliksman, 1997), with the phenomenon in question being food waste and, more specifically, solutions to the U.S. food waste crisis. Using an inductive coding process in which emergent patterns in the data drive the development of themes (Boyatzis, 1998), the researchers developed a series of codes based on the collected tweets. One researcher was responsible for the coding process and developed initial

themes; a secondary coding process was completed in which the original codes were clarified, collapsed, and grouped as subcodes under broader thematic categories.

Sysomos MAP demographic and community analysis. In addition to its aggregation capabilities, Sysomos MAP provides researchers with demographic information for public Twitter users engaged in conversations of interest. This broad demographic data includes gender, distribution by country, and distribution by state (for U.S. users) and province (for Canadian users). The platform also visualizes relationships among conversation participants—conversation communities—and identifies influential members of those communities using a proprietary algorithm based on followership, number of interactions, and tweet volume. Sysomos MAP’s authority scores range from 1 (little or no authority) to 10 (very high authority). Each community’s members are given influence scores based on their interactivity with other members of the conversation. These scores range from 0% (no influence) to 100% (most influential). Demographic data, communities, and influencers were recorded for the 2,892 profiles that produced the original 90,391 tweets generated in the #foodwaste discussion.

Findings

The Sysomos MAP “food waste” search generated 90,391 Twitter mentions of the search term that were posted during the selected timeline. *Figure 1* illustrates the term’s popularity, with unusually high “bursts” of activity denoted by the red circles at the top of each peak.

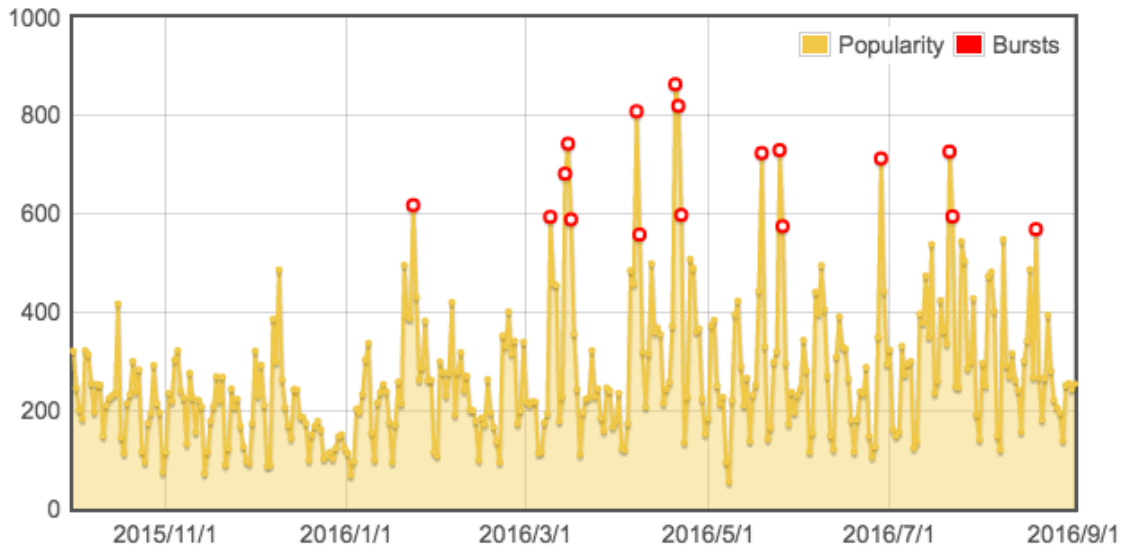


Figure 1. Popularity of the search term “food waste” on Twitter between October 1, 2015 and September 1, 2016. The x-axis represents the number of tweets posted per day.

Analysis of the cluster of bursts between April and May 2016 reveals that Twitter users tied their food waste discussion to Earth Day—April 22—while news outlets like *The Guardian* released articles about environmental impacts that mentioned food waste (Somerville, 2016).

RO1: Demographic and Psychographic Characteristics of Twitter Users Engaged in Food waste-Related Discussions

Sysomos MAP tools were used to collect and report demographic and psychographic characteristics of conversation participants. As noted above, 2,892 Twitter users contributed to the food waste conversation, of which 1,329 provided gender information. Among these users, female participants (52%) slightly outnumbered male participants (48%). All 2,679 users who provided geographic locations were located in the United States, per the geographic filter, with California (18.63%), New York (10.94%), and Washington, D.C. (6.49%) best represented (*Figure 2*).

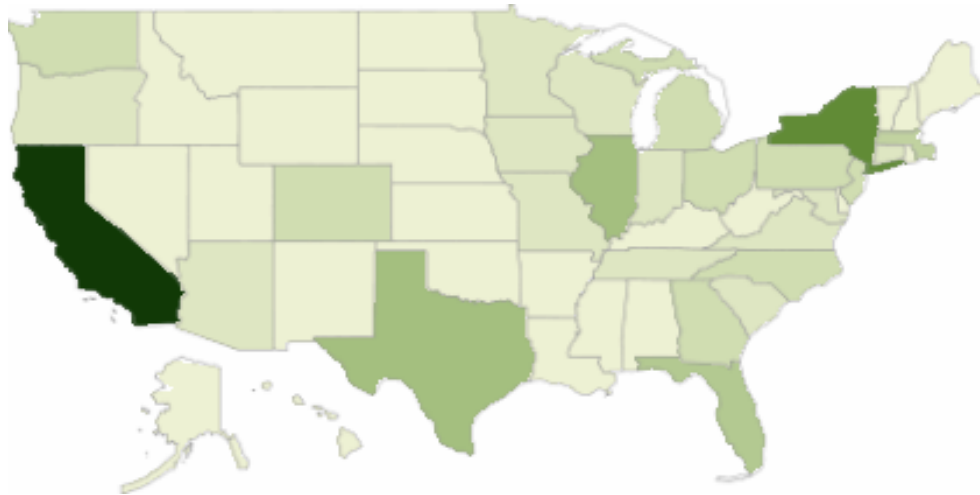


Figure 2. A map of the United States displaying food waste conversation participation among users who publicly share location information. States with higher participation are shaded darker than their counterparts.

Psychographic data, or information related to users’ beliefs, attitudes, and lifestyle choices, were gleaned from Sysomos MAP analysis of Twitter biographies (or “bios”) of top influencers’ followers. Bios are user-generated information related to individuals’ interests, hobbies, and professional and personal lives. We compared user bios of followers of the following influencer accounts, which scored over 90% using Sysomos’s proprietary influencer algorithm: Food Tank founder Danielle Nierenberg (@DaniNierenberg), online news outlet Grist (@grist), *Smithsonian Magazine* (@SmithsonianMag), *Sierra Magazine* (@Sierra_Magazine), Fast Company’s Co.Exist campaign (@FastCoExist), nonprofit organization Food Tank (@Food_Tank), food news site Civil Eats (@CivilEats), and the United Nations Foundation (@unfoundation).

Comparison of word clouds generated from influencers’ follower bios revealed that these individuals share interests in food, sustainability, and healthy living. Most of them work in creative fields, such as writing, music, design, and photography, or in business, marketing, or technology-related careers. They enjoy instructive pursuits like travel, reading, and cooking and

place value on family time. They respect science and believe in and are concerned about climate change and other environmental issues. These individuals are also likely to engage in community leadership activities—many describing themselves as “passionate”—making them ideal conduits for change in their urban and suburban surroundings.

RO2: Food waste-Focused Twitter Communities and Their Influential Members

Sysomos MAP uses network analysis to generate communities of users that interact with each other within the parameters of the search terms and filters. The “food waste” search generated seven user communities (*Figure 3*); for brevity, the four largest communities will be described below.

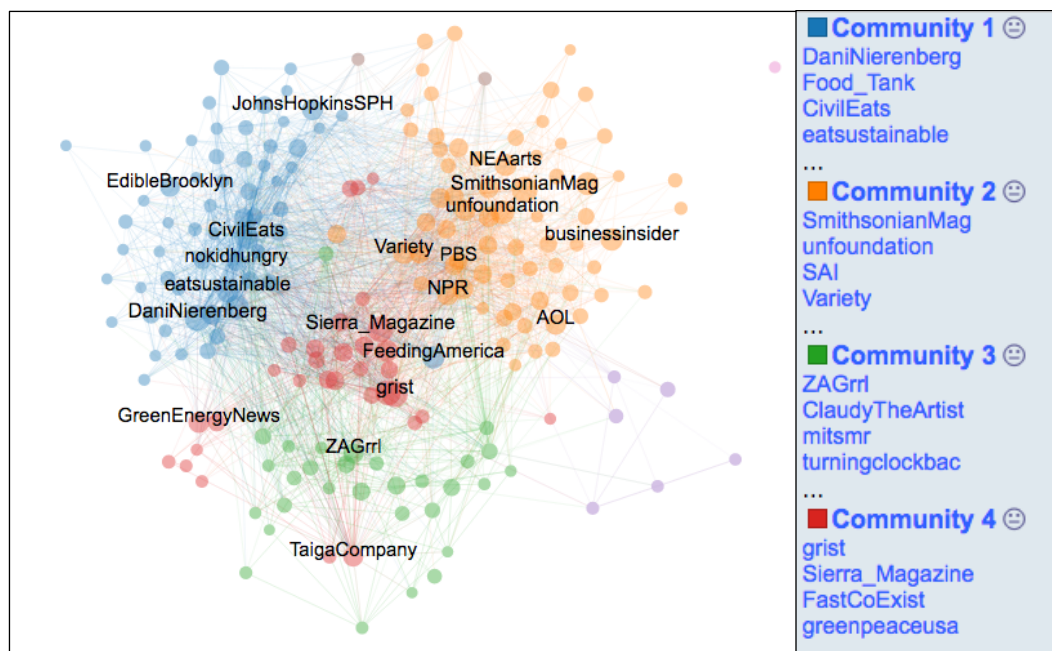


Figure 3. The six communities identified by Sysomos MAP (left) with color codes, sentiment, and key influencers (right). Communities 5 (purple), 6 (brown), and 7 (pink) lacked sufficient user data to warrant further description.

Community 1. Community 1 possesses an average influence score of 66% and comprises such influencers as Food Tank, Food Tank founder Danielle Nierenberg, anti-hunger charity Feeding America, Johns Hopkins Bloomberg School of Public Health, and USDA. The

focus of Community 1 seems to be institutional changes that may impact food waste reduction, such as consumer education, governmental initiatives, and community programs.

Community 2. Community 2 consists of a number of news organizations, including print publications (*Smithsonian Magazine*, *Variety*, *Business Insider*, *Time Magazine*, and *The Economist*); broadcast outlets and programs (NPR, PBS, YouTube, Yahoo!, and *The Today Show*); and popular public figures, including meteorologist Al Roker and First Lady Michelle Obama. Community 2's average influence score is slightly higher than Community 1's at 71%.

Community 3. Community 3 contains a number of lower-influence users representing private individuals rather than organizations, government agencies, or media outlets. The average influence score is 64%.

Community 4. Environmental impacts of food waste constitute the central issue of Community 4. This community includes a variety of environment-related organizations, including *Sierra Magazine* and Sierra Club, Greenpeace USA, the Environmental Protection Agency, and Grist, with an average influence score of 71%. These users can be found at the center of the community network, indicating that Community 4 is a hub for information shared by other communities.

RO3: User-Provided Solutions to the Food Waste Crisis

Of the 3,000 tweets downloaded for use in the content analysis, 1,033 were found to be relevant to Research Objective 3. In these tweets, users suggested or discussed solutions to the U.S. food waste crisis. Thematic analysis of the Twitter data revealed the following themes (examples of tweets from which may be found in Table 1):

1. Domestic or household behavior change;
2. Food-waste diversion and donation;

3. Recycling and upcycling;
4. Consumer education; and
5. Governmental action and policy.

Table 1

Food Waste-Related Themes And Subthemes Produced By A Content Analysis Of Topic-Related Twitter Conversations

Theme and Subthemes	Tweet Examples
Domestic or household behavior change	
<i>Meal planning</i>	#2016HomeResolutions: Have you ever considered a weekly meal calendar? It can save you money time and eliminate food waste!
<i>Waste mitigation</i>	SHARE this with friends to promote reducing food waste by using #leftovers! https://t.co/bo0FBEV1xB https://t.co/FiWS0ashzM
<i>Smart technology</i>	RT @ScienceChannel This smart fridge helps reduce food waste. See more cool tech stories tonight at 8p! https://t.co/xnSWO5wbuW
Food waste diversion and donation	
<i>Large-scale food donation</i>	UK grocery giant @Tesco is donating all unsold food to help curb food waste. #everylittlebithelps https://t.co/mx4skaGJp7
<i>Food waste markets</i>	Walmart's UK grocery chain is selling ugly veggies to reduce food waste. It's time we follow https://t.co/uQQrKOPymP via @HPLifestyle

Recycling and upcycling

<i>Value-added products</i>	RT @ProjectDrawdown Can food waste become fashion? https://t.co/HOkpHTF2sb
<i>Converting food waste into energy</i>	How Colorado Is Turning Food Waste Into Electricity: https://t.co/oQSvnmbgFJ #Innovation #EmpowerNext https://t.co/YiXJC7Fdow
<i>Food waste for agricultural purposes</i>	RT @AllScienceGlobe Feeding food waste to pigs could save vast swathes of threatened forest and savannah - https://t.co/zbnnlSLtUZ

Consumer education

<i>Public information campaigns</i>	Ugly fruit?? "A Campaign to Reduce Food Waste: The #InnerBeauty of Fruits and Vegetables"- https://t.co/qWpYUmBUmU #FoodForThought
<i>Mobile technology</i>	RT @UglyFruitAndVeg This app fights food waste by letting u buy restaurant leftovers. @derekmarkham @TreeHugger https://t.co/PLZgdxWXXw https://t.co/92anAzjyYh
<i>Home economics training</i>	Could a Home Ec Revival Help Slash Food Waste? https://t.co/72G2khnfro via @TakePart

Governmental action and policy

<i>Legislating food waste reduction</i>	RT @michaelpollan: French law forbids food waste by supermarkets World news The Guardian https://t.co/QhaLmbJhcj
<i>Food date labeling</i>	RT @SavorTooth This @99piorg on milk expiration dates is a shining moment in the campaign against food waste https://t.co/p2mN89dA8v

Domestic or household behavior change. According to Twitter users engaged in the “food waste” conversation, food waste reduction begins at home. *Meal planning*, including

weekly meal calendars, using grocery lists, controlling portions, and utilizing meal-delivery services, was a popular suggestion for households trying to curb food waste. *Waste mitigation* techniques, including kitchen garbage disposals, reuse of leftover food, and use of small-scale compost bins, were discussed at length, as was the use of *smart technology*, such as refrigerators with cameras that monitor food quality.

Food waste diversion and donation. Food waste diversion, or redirection of food waste from farms, production facilities, and kitchens away from landfills, was a key theme among conversation participants. *Large-scale food donations* from grocery stores, restaurants, and cafeterias to food pantries and homeless shelters generated positive feedback from users: British grocery chain Tesco and American coffee company Starbucks were lauded for their policies of donating leftover food products. Many users also cheered a Danish grocer's decision to open *food waste markets* to encourage the purchase of previously unsold produce, a tactic echoed by American superstore Wal-Mart with its special section of “ugly” and discounted fruits and vegetables.

Recycling and upcycling. Many users identified examples of *value-added products* made from food waste that may serve as alternatives to landfills. These products included art, such as food-based portraits of clients' pets; upscale meals created by top chefs to demonstrate the value of superfluous food; and clothing produced from food waste. *Conversion of food waste into energy* through methods like digesters and the creation of biofuels was another alternative outlet: Users identified several states and metropolitan areas experimenting with such technology, including Colorado's use of a methane digester to turn food waste into electricity. Leveraging *food waste for agricultural purposes* was recommended by a number of participants,

some of whom noted that insects, worms, and microorganisms could be used to spur composting and that food waste could potentially be used to supplement livestock feed.

Consumer education. Based on the Twitter conversation content, food waste is a growing perceptual issue among consumers, and many identified specific *public information campaigns* targeted at households. For instance, toy company Hasbro created an “ugly” Mr. Potato Head figure to normalize blemished produce; a photography contest allowed artists to depict food waste and share their images online. *Mobile technology*, such as smartphone apps, could bring food waste monitoring and measurement tools direct to consumers, and several participants specifically mentioned FoodKeeper, an app that monitors groceries’ freshness based on purchase dates. A number of participants advocated for the return of *home economics training* to K-12 education in the United States.

Government action and policy. The United States lags behind in *legislating food waste reduction*, a fact brought to bear by conversation participants who praised laws cutting down waste from restaurants and grocery stores in Italy, France, Spain, and Denmark. Many participants identified Congresswoman Chellie Pingree’s Food Recovery Act as a potential statutory solution to food waste. Likewise, *food date labeling* was a major area of discussion: Imprecise expiration dates result in large amounts of food being thrown out, and participants pushed for more research and, potentially, bureaucratic action on improving the efficacy of food labels.

Discussion

The purpose of this study was to investigate the Twitter conversation surrounding food waste in the United States; specifically, to describe participants, to define communities of users,

and to catalog potential solutions based on participants' informal creative crowdsourcing. While we cannot, of course, claim causation between Twitter users' participation in this discussion and their practicing food waste reduction techniques, based on the work of Bandura and other social cognition researchers, we may infer that their information-sharing represents the potential for exertion of thought into action. As Fatkin and Lansdown (2015) note, online activism does not require strong organizational structure or interpersonal relationships; rather, social change may be affected by individuals who feel empowered by networking online with likeminded individuals.

Through this study, we now know a bit more about the individuals and communities engaged in online food waste problem-solving. They tend to be located in states and regions known for environmental awareness and policy (Wingfield & Marcus, 2007), and they tend to be white-collar professionals in creative or technological fields with an interest in health and sustainability. They build social-media networks by following influencers in news media, government, and science and technology, and their willingness to disseminate information regarding topics of importance—their collective agency—indicates that they may be ripe for turning their online words into actions. Online social support has been shown to influence Web 2.0 users' perceived real-world self-efficacy (DeAndrea et al., 2012); thus, becoming part of likeminded networks for change could encourage food waste discussants to deploy solutions and tools in their everyday lives.

The food waste Twitter chatter itself reveals a wealth of information about how participants feel they—and American society—can best address the food waste crisis. With solutions ranging from startup technologies to reviving home economics training in schools, the conversation represents a sort of unorganized but passionate crowdsourcing of ideas or collective

intelligence (Brabham, 2008). The concepts addressed most often—among them household behavior change, food diversion and donation, reusing or upcycling food waste, consumer education, and government intervention—provide an excellent starting point for nonprofits, government agencies, universities, and other groups to plan and mobilize collective action among individuals who already feel strongly about their own agency to contribute. As researchers continue to analyze the issue, these can serve as a stepping off point to further look for solutions and how to engage consumers interested in solving food waste problems.

Recommendations for Organizations

Based on our findings, we recommend that organizations leverage Twitter as both a space to mine solutions, volunteers, and other resources and as an area in which to test ideas among motivated and receptive audience members. Social-mediated crowd wisdom is essentially low-risk market research that allows engaged entities to test new technologies or concepts without incurring the high costs of production or dissemination. The Twitter communities identified in this study represent potential test markets: groups of users with similar interests and backgrounds that are linked thru shared connections to specific influencers in a variety of fields.

Organizations should not only utilize the influencers' followerships and communities, but should also engage with the influencers themselves. The Twitter accounts shown in Figure 4 represent loci of online conversation; information circulated by those users has the ability to reach and sway whole communities and to stimulate both collective agency toward real-world involvement and creative crowdsourcing of solutions.

Recommendations for Future Research

Using Twitter as a scientific research tool is a relatively new concept, and care must be taken to avoid extrapolating real-world outcomes based only on social media-generated data. To

that end, food waste researchers should survey members of the identified communities to see what solutions they actually do or plan to implement; potential correlations could then be calculated between social media use and real-world food waste reduction agency. In a similar vein, these Twitter users could help identify barriers to implementation of new technologies or techniques aimed at eliminating discarded food. The communities identified could also potentially serve as a testing ground for online snowball sampling techniques, wherein influencers could identify key individuals for study, disseminate surveys among their community members, and encourage participation to improve response rates.

Because we focused our data collection on Twitter conversations, potential material generated by users of other social media remains unstudied. Future research should investigate how food waste is discussed (and by whom) on Facebook, Instagram, and other emerging social media platforms. Researchers should explore the benefits of studying such tools around moments in time that spark such intense discussion like that of Mr. Oliver's segment did. By watching social media trends at times of movement like political speeches or organizational announcements we can also begin to better understand how the online populace will continue these discussions and influence movement.

The movement of this issue was not new when Mr. Oliver engaged his audience, but it did serve as part of the catalyst in the uproar that led to the announcements seen by federal agencies. As researchers and communicators we should strive to better understand how such online influence can impact our political leaders in pushing forward on important agriculture and food related issues.

As society and media continue to engage in complicated issues, like food waste, it behooves us to capture the power of crowdsourcing and social media engagement to not only

keep pulse on situations, but to also explore the range of proposed solutions and ideas being offered. As seen in this study, the communities are well connected to many influencers and by pulling together such knowledge from a variety of communities, undiscovered ideas and thoughts could be garnered and lead to further change and growth. We have done a good job of researching and using traditional media to move the needle on many important issues. It is now time that we better grasp online communication and networks to do the same.

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Engagement and Extension: An examination of internal branding in [state] Extension
Research Paper

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Abstract

The purpose of this study was to understand how an internal audience communicated the brand of K-State Research and Extension. By understanding how it is currently communicated, K-State Research and Extension can move toward unified and harmonious communication with and among stakeholders and to external audiences. This will increase organizational awareness and recognition. Focus groups were conducted with Extension agents in five Kansas locations, varying in geographic location and population densities. There were six or more participants present at each focus group. The findings from this study indicate that the land-grant mission is not widely understood by the public, training in marketing is essential, and the term “educator” is more inclusive and understood than “agent.”

Keywords: Extension, engagement, marketing, land-grant, agent

Engagement and Extension: An examination of internal branding in K-State Research and Extension

Introduction

A study done in 2015 by Anderson and Rumble evaluated the public perception and awareness of K-State Research and Extension in the state of Kansas. This study showed that only 11% of the respondents were moderately familiar with K-State Research and Extension, the shortened name for Kansas State University Agriculture Experiment Station and Cooperative Extension Service. Thirty-five percent were aware of a local office in their community (Anderson & Rumble, 2015). While other state studies are not available, national data indicates Kansas is not unique (Warner, Christenson, Dillman, & Salant, 1996; Clarkson-Frisbie, Bartman, Gregov, Gregory, & Hoelscher Day, 2008). Extension is known as the “best kept secret” by many (DeBord, 2007, para 1).

This lack of awareness among the residents of Kansas motivated communicators and administrators to examine the overall branding and marketing of K-State Research and Extension. The examination of this brand began with focus groups to study how internal audiences were currently communicating the brand of K-State Research and Extension. By understanding how the brand is communicated, communicators could work with stakeholders to produce unified and harmonious communication with external audiences. This congruous communication could increase organizational awareness and recognition. Previous research has shown that K-State Research and Extension employees believe in the Extension brand (Ray, Baker, & Settle, 2015). Employees of an organization are what determines the success in delivering the brand and identifying the organization (Hatch & Schultz, 2002). Organizational identity is defined as a

common perception of the organization's principles and attributes (Hatch & Schultz, 1997). This study sought to combine the identity the employees have of K-State Research and Extension and principles of organizational identity to propel the mission of K-State Research and Extension. The results of this study should help to inform the possible rebranding and marketing of K-State Research and Extension.

Purpose and Objectives

The purpose of this study was to examine how internal audiences were communicating the brand of K-State Research and Extension. The study was guided by the following research questions:

1. How do local Extension agents communicate the brand of K-State Research and Extension?
2. How do Extension agents value the term research and perceive that the term research is valued by the public?
3. How is the land-grant mission communicated by Extension agents?
4. What are agents' perceptions regarding organizational awareness among local audiences?

Methods

In order to fully understand the struggles, challenges, identity, and motivations of the internal audiences an in-depth understanding was necessary. Qualitative research methods can yield that in-depth understanding and rich data. Focus groups were used to collect data from K-State Research and Extension personnel. The question route for the focus group was developed by the researchers and reviewed by a panel of experts. The protocol was developed based off of the protocol suggested by Krueger (1998). Questions focused on how those involved brand

themselves on a day-to-day basis and how they perceive their audiences receive the brand and their information.

Participants for this study were selected by contacting Extension area directors. They were asked to nominate participants they thought would offer relevant opinions to this study. Once those participants were nominated, they were recruited via email. Participants for the Extension agent focus groups were also recruited based on their proximity to the five focus group locations. This overall sampling technique is known as purposive sampling. This method ensures that participants have a clear understanding and knowledge of the subject matter.

Every focus group was conducted by the same moderator and assistant moderator. The moderator facilitated the focus group, and the assistant moderator took field notes. Each focus group was audio recorded. Audio recordings were transcribed by a professional transcription service. The researcher then re-listened to recordings to check transcription for accuracy. Transcripts were imported into Nvivo 10 to be analyzed. Glaser's (1965) constant comparative was used to guide the analysis. While coding, the researcher compared each transcript with previous transcripts that had been coded. These comparisons were based upon memory and notes. Codes were then sorted into themes. A theme was considered to be an overarching idea that were expressed by more than half the total participants. Themes were then reviewed and confirmed with the assistant moderator, who was present at every focus group to increase credibility (Krueger, 1998).

Results

There were five major themes associated with responses of participants regarding the branding and awareness of K-State Research and Extension: *the land-grant mission is misunderstood by multiple audiences, the value of the term “research” was not high or homogeneous, training in marketing is essential, the perceived awareness of Extension was uneven and incorrect, and the term “educator” is more inclusive and accurate than the term “agent.”*

The land-grant mission is misunderstood by multiple audiences.

This theme dealt with the perception of public understanding of the land-grant mission and the different audiences with whom agents communicate the mission (Table 1). In general, the participants felt that no audience really understood that mission, sometimes even internally. This also relates to the role of Extension in the university – as an essential part of the university mission. The connection to and distinction between the university and Extension is not clear. In addition, the local units reported competing interests from the county commissioners or district board and the state level Extension.

Table 1. Land-grant mission misunderstood

Topic	Comments	Quote
Why is Kansas State University in my county and how does K-State Research and Extension relate?	•Is there a difference between Kansas State University and K-State Research and Extension?	...sometimes with 4-H, they have a connection with 4-H but they may not realize that there's a connection with Kansas State.
General lack of knowledge of land-grant mission	•Internal and external audiences alike do not understand the purpose of the land-grant	Internal audiences don't always understand the importance and value of the land-grant mission
A clear distinction/connection between the university and Extension is not understood	•Internally it is not fully understood where the distinctions and connections are; therefore it is not surprising that they public does not understand either.	There's pressure from Extension, to K-State Research and Extension, to be tied to them but yet there's this bigger tie to the university, but yet they're separated... To me, they're interchangeable, it's all the same thing.
Competing interests with county or Kansas State University	•Where are agents supposed to identify first?	We say Union County K-State Research and Extension. It was brought up by a commissioner a long time ago that the vast majority of our funding comes from Bubble County...we got that changed really quick.

Extension agents felt that the land-grant mission was not understood by the public. The agents also had a hard time distinguishing the Extension service as different from the University. Many of those agents also questioned the necessity in making that distinction, “as long as they know it [research and information] comes from K-State, does it really matter?” This statement, or similar statements, were brought up in each focus group. Participants then quickly followed by a statement regarding budget and how each entity of the university was funded differently; And therefore needed to be identified as separate entities.

The value of the term “research” was not high or homogeneous.

The term “research” was not seen as important to local clientele groups, according to participants, and clientele did not seem interested in research as a product, with the exception of agronomic research. The agents felt that research is an important differentiating quality of the education that they provide and feel that their clientele understand that the information they provide is research based because it is tied to the university. Moreover, the inclusion of the term “research” within the name of the organization may not be necessary.

Table 2. Value of the term “research”

Topic	Comment	Quote
Agents feel research-based information adds value to the organization and is communicated because of link to university.	•Agents pride themselves on providing research-based, unbiased information	I think it adds a level of professionalism too with our title and our roles...it [the name] is a mouthful
The local level audience does not value research	•The research is not always understood or appreciated at the local level •Those who appreciate research already understand that research comes from the university	Considering there’s relatively few Extension specialists left in the system, the most of them identify themselves as a researcher first and foremost and the Extension specialist as an afterthought in most program fields. It probably maybe valid with the state level but when you talked about local people, which you’re talking to, it (research) doesn't (matter).
Among audiences, research is valued by those interested in agronomy, but is not important or discussed among other groups	•Agronomy is the most represented and appreciated when it comes to the importance of research among local clientele	The guys really want to know what milo varieties have resistance, etc. So we do promote, in agronomy I promote research, but otherwise...it’s Extension not research.

Training in marketing is essential.

Local unit participants felt that they were not trained well in marketing and need continuous training. Training was also identified as needed for office professionals who produce materials and market the organization at the local level. A lack of training and understanding of marketing guidelines was cited as the cause of the tentative marketing efforts by local agents, i.e. agents didn’t want to be reprimanded for using a logo incorrectly or another marketing mistake.

Table 3. Need for training in marketing

Topic	Comments	Quote
Marketing is an important topic that needs attention	•Agents thought a training at annual conference would be helpful	A one day marketing update...teach us what you know...with some useful items...so we can go home and apply it
Office professionals need training too	•Agents are not the only people working to market the organization	I think training is critical for office professionals and staff because we all create our own stuff...our office professionals also create for us
People want to do marketing correctly	•There have not been appropriate training or understanding of marketing in the past	We really want to do it right, just teach us how and have clear guidelines.

The perceived awareness of Extension was uneven and incorrect.

Participants were asked how aware they believed their audiences/clients were of K-State Research and Extension. Some local unit participants felt their clientele were very knowledgeable while others felt awareness was poor. Statewide data collected by the University of Florida (Anderson & Rumble, 2015), demonstrated that awareness and name recognition among Kansans was low.

Table 4. Inconsistent understanding of the level of awareness regarding Extension

Topic	Comments	Quote
Low-level of Awareness	•Realistic view of awareness/recognition	We just had the stripe rust thing go through in our area. One of the guys that I went out to look at his fields, we spent about three hours looking his fields and he told me, "I've been a farmer for 40

		years and I've never used Extension once.”
Those who are aware of Extension know it well and use it often	•Repeat customers or those with a family history of using Extension come back time and time again	If you look at the whole county and the people that are out there that could be using us, there are some people that are very faithful, high level of awareness. But overall I'd say we're medium to weak.

“Educator” is more inclusive and accurate than the term “agent.”

Local unit participants often refer to themselves as “educators” as opposed to “agents” because they feel it is more descriptive of the work they do. Agent also has connotations of sales or regulation, which could seem counterproductive. One agent commented that she already introduced herself as an educator rather than agent because it more closely reflected what she did in her role.

Table 5. “Educator” is more appropriate than “agent”

Topic	Comments	Quote
Educator more accurately describes their role	•The work is in the area of education	I like to say that I’m a county Extension educator instead of agent, because I think that’s more descriptive of what I do, I educate. I don’t think an agent really says much about what I do.
Educator is more relatable to new audiences or clientele	•Agent is vague	It’s a great way to explain who we are to a lot of people who don’t otherwise know that.
Educator is more current and relevant	•Agent is dated	I do think that’s one change we can make bring ourselves into the current.

These themes were present in each focus group, regardless of location. Participants, both rural and urban, stated that urban interests and needs were different than rural interests and needs.

However, struggles were universal and there was nothing distinctly different between rural and urban agents.

Discussion and Conclusions

The focus groups provided a clearer picture of some of marketing challenges and helped researchers understand the willingness of local units to implement techniques, tools, and new directions. While urban units felt their needs were different than rural units, researchers found no differences related to that characteristic or to geography.

The words “research and” in the shortened name of K-State Research and Extension are often dropped when referring to the organization. Local units indicated that clients recognized that the

information provided was research-based because of the university tie, but were not interested in the research, except in the subject area of agronomy. The concept of “land-grant university” was perceived as poorly understood. While this is likely true, it is unclear what these groups want others to understand about the land-grant mission.

When marketing materials are available and new directions are established, a concerted, strategic, and intentional training initiative should be deployed and focused on all employees at the local level first, including office professionals as well as agents. State level training also should be conducted. Online learning tools and archives should be used to effectively delivery training.

When applying this research to other universities, it should be noted that names matter. How and what Extension refers to themselves matters. When administrators train new agents they tell them they are educators, but then give them a dated title of agent, creating dissonance. While some institutions have made this change, not every institute has followed suit. The term “agent” no longer refers to the original change agent, but in today’s society is more related to insurance or a spy organization. Working titles in the system can be changed and this should be given serious consideration. While agent might have been appropriate at some point in the past as “change agents” or “information agents,” the aspiration of the organization is both learning and behavior change. Thus, the title of educator may be more appropriate at this time. Moreover, the term “Extension” may not resonate with people in the intended manner.

Additionally, the local units are the greatest opportunity for marketing. Agents talked about word of mouth as the strongest source of marketing for their services. It is important to enable local

offices to have great marketing materials. Great marketing materials are more important at the local level than anything that is done statewide.

In 1999 the Kellogg Commission called for Land-Grant Universities to become engaged institutions. It defined engaged institutions as “institutions that have redesigned their teaching, research, and extension and service function to become even more sympathetically and productively involved with their communities,” (Kellogg, 1999). Rather than the traditional model of thrusting information at audiences, the Kellogg Commission, this study, and other recent studies (King, 2016), call for Extension to engage with communities and establish common community goals and partnerships. This shift needs to be intentional and clear. Changing the title of Extension agent to educator could be a good first step in this endeavor. Agents who are engaged with their communities are more sought out as opinion leaders (King, 2016). By engaging more with communities and truly inquiring about their needs rather than thrusting information according to its own agenda, Extension will thrive rather than survive.

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Fracking frames: A framing analysis and comparative study of hydraulic fracturing coverage in American newspapers

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Abstract

Science generally lends itself to controversy as technical decisions often become politically influenced. Hydraulic fracturing is currently a controversial topic in the media and is worthy of further exploration to understand the types of frames being used to communicate the issue. Before this study, no research examining the coverage of hydraulic fracturing in the news media could be found, and an understanding of how the issue was communicated could assist in understanding the influence on public participation and opinion. To analyze frames associated with the issue of hydraulic fracturing, quantitative content analysis was used to evaluate dominant frames found in regions practicing fracking within the United States from 2010 to 2013. Content analysis was conducted on 203 news and feature stories. With the number of news and feature articles increasing each year examined in this study, it seems reasonable to assume that fracking is a topic following the path similar to other science issues, such as nuclear energy. It appears that the issue raises a variety of questions for various stakeholders, and a likely result is that more media attention will be paid to the issue of hydraulic fracturing. While the articles were framed in a variety of ways, the indication of community involvement may suggest the role community members are taking against or in favor of the issue. This study demonstrates that fracking is both a science and political issue, and will likely continue to be woven into public policy agendas, which will impact communities.

Keywords: Fracking, Newspapers, Framing, Content Analysis, Hydraulic Fracturing, Public Agenda

Background

Hydraulic fracturing (fracking), commonly referred to as fracking, is a procedure used in the majority of natural gas wells in the United States where water, sand, and a mixture of chemicals are pumped thousands of feet underground through a well to break up rock, also known as shale, to release and collect natural gas. The fracking process is implemented to allow oil or natural gas to move more freely from porous rock to production wells, which are designed to bring oil and natural gas to the surface (United States Environmental Protection Agency, 2012).

Fracking works when pressure strength from the fluids pumped into the geologic formation exceeds the strength of the rock. When this occurs, fractures are created and the natural gasses rise toward the surface along with the flowback, or recovered fracturing fluids (U.S. EPA, 2012). After the natural gas has been extracted, the water and chemical mix recovered from the process is stored in open pits before being transferred to a water treatment plant. After extraction, natural gas is moved via pipes to market (Granberg, 2013). With the advances made in the fracking industry, due in large part to the use of hydraulic fracturing and also technology allowing for the discovery of shale basins, more states are now practicing fracking. While fracking is not a new method in the oil and gas industry, the use of drilling horizontally through shale is a new application (Aller, Zwierschke, Weatherington-Rice, Houston, Dougherty, Shaner, and Johnson, 2013).

Some areas of the United States have practiced fracking longer than others, but in many areas there is concern and controversy associated with fracking practices. The Pew Research Center (Kohut, Doherty, Dimock, and Keeter, 2012) has found that the awareness of fracking leads to more favorable opinions as gas prices rise. However, fracking remains an issue which citizens hold both positive and negative opinions, perhaps due in part to its complex nature and

unknown consequences.

The controversial nature of fracking has brought forth strong arguments both in favor and against the practice, and stakes for the industry are high. In California alone, the Monterey Shale basin is estimated to have amounts of oil equivalent to five years of U. S. petroleum imports and could create as many as 500,000 jobs in the next two years (Buford, 2013).

The practice of fracking has led some communities to experience an economic boom. In one oil and gas-drilling town, Schultz (2011) reported few signs of recession and claimed some businesses had grown by 100 percent due to the influx of people migrating to the community to work in the oil and gas drilling industry. Conflicting viewpoints focus on issues such as environmental risks versus economic value associated with fracking.

While the economic benefits may be great for landowners, there are also unintended consequences that many landowners may be unaware of. Drilling activities can affect many aspects of life on a landowner's property including the quality of well water, water quality in springs or ponds, drilling pad construction close to a home or livestock, interruption of sleep due to activities taking place at the drilling site, and the selling of leases to different companies throughout time (Aller et al., 2013).

Nature published arguments both for and against fracking practices in 2010. In the article, one author argues that fracking is met with fear levels with unfounded evidence, and that fracking will increase employment opportunities, stimulate the economy, positively influence national security, and potentially reduce greenhouse gasses (Howarth, Ingraffea, and Engelder, 2010). On the other hand, a different author argues that fracking has resulted in environmental damage, drinking water contamination, and holds the potential to have a worse greenhouse gas footprint than other fossil fuels such as coal (Howarth et al., 2010).

Significance

Science like fracking is generally prone to controversy, as technical decisions often become politically charged. Fracking is currently a controversial topic in the media and worthy of further exploration on the types of frames being used to communicate the issue. If fracking follows the paths of similar science and technology issues, it is reasonable to argue there may be further conflict and frame development before the issue is resolved. Further, MacLeod (1995) argues that when government invests in new technology, especially when issues of property, health, and environment may be at risk, full disclosure of information and a clearly argued case is required.

As frames have the potential to influence public opinion and knowledge, as well as public acceptance and policy development, this study may lend further insight to the state of the issue and help to predict what lies ahead. It can be argued that public opinion, knowledge, and acceptance will lead to policy development. Therefore, this study will provide information on how the issue of hydraulic fracturing might play out over time.

Furthermore, this study will aid in the American Association for Agricultural Education's (AAAE) National Research Agenda by furthering its priority area number one, public and policy maker understanding of agriculture and natural resources (Doerfert, 2011).

Objectives

Given the expansion and growth of hydraulic fracturing and opportunities presented with shale basins, universities are undertaking new research initiatives to learn more about areas such as human health impact, groundwater impact, and air and soil quality (Filipic, 2013). However at this time no research has been conducted to examine the coverage of fracking in the news media, and its importance in understanding how the issue is communicated as news coverage may influ-

ence public participation and opinion. The objectives of this study are to:

- 1) Identify dominant news frames in mainstream newspapers that cover hydraulic fracturing.
- 2) Determine what sources the news media most commonly rely upon for hydraulic fracturing information.
- 3) Compare and contrast hydraulic fracturing frames used in media discourse by different regions of the United States.

Framing Theory

To understand the coverage of fracking, the researchers used framing theory to guide the analysis. Many scholars have contributed works that lend insight to framing theory, analysis, and implications. Frames are tools for making complex issues easier to understand (Scheufele and Tewksbury, 2007). When issues are complicated and complex, frames are used to make sense of relevant events and suggest issues (Gamson and Modigliani, 1989). Frames also hold potential to suggest relevancy to issues and also what can be overlooked or noteworthy of attention (Nisbet and Hume, 2006). As will be discussed, some scholars have demonstrated that framing in media holds potential to impact public opinion, response, or involvement. The print media's utilization of frames will have significant impact on the future of the agriculture industry (Meyers and Abrams, 2010).

Chong and Druckman (2007) asserted that frames work by arranging everyday reality by: 1) making new beliefs (availability), 2) making certain beliefs accessible, and 3) making beliefs "strong" (applicability). Scheufele and Tewksbury (2007) argue, however, that framing is not based upon accessibility and assert that framing assumes that the way an issue is shared in the news influences the audience's understanding of the issue. Scheufele and Tewksbury (2007)

also claim that framing “describes how people use information and presentation features regarding issues as they form impressions,” (p.12).

Frames are often presented in packages and offer a variety of devices such as metaphors, exemplars, catchphrases, depictions, and visual images to encourage a way of thinking about an issue (Gamson & Modigliani, 1989). Pan & Kosicki (1993) add that framing “views news texts as consisting of organized symbolic devices that will interact with individual agents’ memory for meaning construction,” (p. 58). The variety of devices may be further used for collective action frame generation, which occurs by articulation and amplification (Benford and Snow, 2000).

Pan and Kosicki (1993) argue that a news frame may be interpreted as a “cognitive device used in information encoding, interpreting, and retrieving; it is communicable; and it is related to journalistic professional routines and conventions,” (p.57). Frames can be used to shape and influence readers’ policy preferences and opinions by highlighting certain aspects of a controversial topic (Tewksbury, Jones, Peske, Raymond, & Vig, 2000). Benford and Snow (2000) argue frames can be used to describe solutions and plans for solving problems. However, before preferences and opinions can be shaped, it is important to keep in mind that in order for frame evaluation to occur, motivation is essential (Chong & Druckman, 2007).

Pan and Kosicki (1993) argue that framing may be studied as a characteristic of news discourse, which begins when a newsworthy event occurs. Sources, journalists, and audience members participate by designing, constructing, transmitting, and acting upon the frame (Pan and Kosicki, 1993). Framing devices within news discourse can be classified into four categories that align with the field’s structural dimensions which include: 1) syntactical structure, which follows the inverted pyramid structure; 2) script structure, which is descriptive and narrative; 3)

thematic structure, which is used to test hypotheses; and 4) rhetorical structure, which is used to invoke images (Pan & Kosicki, 1993).

The news frame goes through a process beginning with its creation and ending with an impact or result. Framing begins with the identification of a complex issue by the news media and ends when media consumers experience an impact, take action or get involved with the complex issue first identified by the media. The news media, after identifying the complex issue, constructs the framing device, and then amplifies the frame. The media consumer, who must be motivated to receive the framing device, next evaluates the message presented in the frame, and the media consumer's beliefs or understanding of the issue may be affected. As a result, the media consumer may experience some impact as a result of the frame.

Methodology

To analyze frames associated with the issue of fracking, quantitative content analysis of newspapers was used to evaluate dominant frames found in the four regions practicing fracking within the United States from January 1, 2010 to October 31, 2013. Content analysis is "a research technique for making replicable and valid inferences from data to their context," (Krippendorff, 1980, p. 21). Variables were identified and assigned numbers in the content to demonstrate variation. Quantitative content analysis is a reliable technique as it is replicable and objective (Krippendorff, 1980). Content analysis is also a useful method for identifying and examining trends and patterns within documents (Stemler, 2001).

The target population for the study was news stories and feature stories pertaining to hydraulic fracturing appearing in eight of the largest American newspapers by daily circulation rate in April 2013. The eight of the largest newspapers by daily circulation rate identified were the *New York Times*, *USA Today*, *Los Angeles Times*, *New York Daily News*, *New York Post*, *Wash-*

ington Post, Chicago Sun Times, Denver Post, (Lulofs, 2013).

Newspaper content analysis was selected for a variety of reasons. Newspapers play an important role in the realm of mass media by serving as a means for sharing information and details on local events and issues with community members. It has been shown that other sources within the news media also have a tendency to favor issues covered by newspapers that promote economic growth (Andrews & Caren, 2010). In this regard, it appears that newspapers may set the stage and hold some power in determining selected news topics for other mass media platforms.

Articles were collected using the LexisNexis database for all newspapers included in the study except for the *Chicago Sun Times*, in which articles were selected from the NewsBank database. Articles were identified in the databases by searching for the terms “hydraulic fracturing” or “fracking”.

Duplicates and irrelevant articles were eliminated from the study. Content analysis was conducted on news stories and feature stories. Omitted from the study were opinion pieces, editorials, reviews, and other non-feature or non-news story types. These pieces were omitted because content in opinion pages tends to focus on issues of ethics, morality, conflict, and values (Nisbet and Huge, 2006). Non-news and non-feature stories may be more likely to feature bias and lack news information.

A total of 1,599 articles were identified in the eight newspapers mentioned above by the Internet news databases, LexisNexis Academic and NewsBank. After removing non-news stories and non-feature stories from the population, a new population of 870 articles was established. According to Krejcie and Morgan (1970), a sample size of 265 is appropriate for a given population of 870. The sample was constructed to ensure appropriate representation for each newspaper

involved in the study by calculating the percentage each newspaper contributed to the given population. Articles were numbered and random.org was used to select articles from the population for the sample.

During data analysis, an additional 62 articles were removed from the sample as they were determined to be irrelevant. An article was thrown out for irrelevancy if it was not a news story or feature story, or if fracking was not a main focus of the article. A total of 203 articles were included in the study. Coding was based upon state or region featured, newspaper name, publish date, section of newspaper, type of article, word length, sources referenced, author, overall tone, dominant frames, and image accompanying the article (which was included in the search results).

Results

As noted previously, two newspapers were eliminated from the study leaving eight newspapers to examine. Articles were selected from the remaining newspapers and analyzed. The *New York Times* (38.4%) and *Denver Post* (21.2%) had the most articles examined (Table 1).

Frequency of Articles by Newspaper		
	Frequency	Percent
New York Times	78	38.4
Denver Post	43	21.2
Washington Post	27	13.3
New York Post	24	11.8
USA Today	11	5.4
New York Daily News	9	4.4
Los Angeles Times	9	4.4
Chicago Sun Times	2	1.0
Total	203	100.0

Table 1. Frequency of Articles by Publication

The number of articles pertaining to fracking increased with each year examined in this study. Eleven articles (5.4%) in this study were printed in 2010, 45 articles (22.2%) were printed in 2011, 70 articles (34.5%) were printed in 2012, and 77 (37.9%) articles were printed in 2013. Years 2010, 2011, and 2012 each contained 12 months, but due to time limitations associated with the study, 2013 contained 10 months .

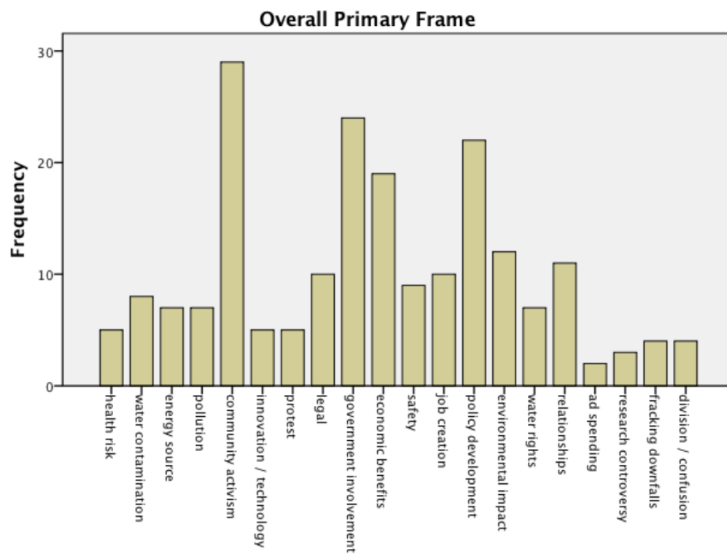
News features were identified more often than feature stories as the sample included 144 (70.9%) news stories and 59 (29.1%) feature stories. The mean of words per article was 796, the median was 612, and multiple modes existed, with 331 as the smallest value.

The shortest article in the study was 50 words and the longest article was 5,670 words. An image or images, which included charts, photos, graphs, drawings, maps, or diagrams, appeared in 83 (40.9%) of the articles examined. No image was included with 85 (41.9%) of the articles, and it was unknown if an image was included with 35 (17.2%) of the articles in the study.

Section A was the most common section that articles in the study were found (29.6%). Articles were identified in 14 different sections within the various papers examined in the study. Additionally, staff writers were the authors of 192 (94.6%) of the articles. Other authors were defined as the AP Newswire, Times Wire, and Reuters (5.4%).

Objective 1: Objective one sought to identify dominant news frames pertaining to hydraulic fracturing in the 10 largest American newspapers by daily circulation rate. Primary and 48 secondary frames were identified in the articles within this study. A total of 22 different frames were identified within the articles (Figure 1).

Of the 203 articles analyzed, community activism was featured as a primary or secondary frame in 49 of the articles (24.1%). Community activism framed articles included headlines such



as, “fracking gets its backers, attackers,” and “Blue Ridge becomes battle line over fracking.”

Figure 1. Frequency of Primary Frames

Government involvement was featured as a primary or secondary frame in 48 of the articles (23.6%). Articles with government involvement frame featured headlines such as, “Bloomberg backs ‘responsible’ extraction of gas and pays to help set up rules,” and “officials push for clarity on oil and gas leases.”

Policy development was featured as a primary or secondary frame in 26 of the articles (12.8%). Headlines found in articles framed with policy development included examples such as, “Obama seeks views of experts, executives on energy policies,” and “disclosing of fracking chemicals proposed.”

Community activism was the most frequently appearing primary frame as it occurred in 29 (14.3%) of the articles examined, followed by the government involvement frame, which occurred in 24 (11.8%) of the articles examined. It was most common for an article to contain no secondary frame, as 30 (14.8%) articles featured only a primary frame. Of the frames identified other than none, government involvement, and policy development occurred the most frequently

as a secondary frame as both appeared in 24 (11.8%) articles each.

Researchers also examined the articles in the study to determine the tone in which the article was written and presented. The majority of the articles were written with a neutral tone (157 articles, 77.3%), while 33 (16.3%) articles were framed negatively, and 13 (6.4%) articles were framed in a positive manner. Positive articles were most commonly framed by communicating economic benefits or job creation (30.8% for each of these two frames). Innovation or technology was the second most common frame for articles written in a positive tone. Examples of headlines in articles written in a positive tone included, “the coming oil boom,” and “states’ oil and gas fields employ nearly 30,000.”

Negative articles saw the most common frames as water contamination (15.2%), followed by pollution and safety (12.1% each). Headline examples of articles written in a negative tone included, “quake linked to waste water well,” and “as fracking increases, so do fears about water supply.”

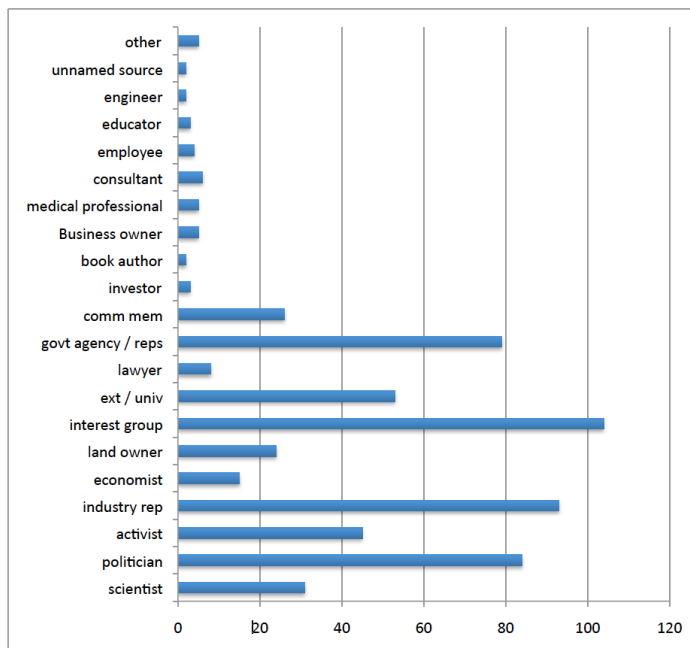
Neutral articles were most commonly framed in terms of community activism (17.8%), followed by government involvement (14.6%). Articles written neutrally featured articles with headlines such as, “residents discuss fracking,” and “cuts in state agency are troubling, environmentalists and gas drillers agree.”

Objective 2: Objective two was to determine what sources the news media most commonly relied upon for information on hydraulic fracturing. Twenty source types were identified, and five outlying sources were categorized as “other.” A total of 599 sources were referenced throughout the 203 articles with the average number of sources per article at 3.

The maximum number of sources in an article was 10 and the lowest number of sources referenced in an article was zero. The sources listed in the other category appeared only one time

and included a political blogger, *TIME* magazine, a cooperative, the National Weather Service, and AP Report.

Interest groups were cited commonly within the articles and appeared in 104 (51.2%) of the 203 articles. Industry representatives were the second most commonly cited sources and appeared in 93 articles (45.8%). Political leaders or elected officials were cited in 84 (41.3%) of the



articles included in the study (Figure 2).

Figure 2. Frequency of Sources Cited

Objective 3: Objective three of the study was to compare and contrast fracking frames used in media discourse by different regions of the United States. Colorado was the most commonly featured state in 45 of the articles (22.2%), the nation was featured in 48 of the articles (23.6%) and New York was the most prominently featured state with 49 articles (24.1%). States featured in the news and feature articles in the study were placed into one of four regional categories. Four regional categories were constructed based upon the regions identified by the United States Cen-

sus Bureau (2010).

New York and Pennsylvania were placed in the northeast region category. Fifty three articles were included in this category and 17 frames were identified as primary or secondary within the articles that were a part of the northeast region. Community activism was the most commonly occurring primary frame in the selection of articles featured in the northeast region with 14 (26.4%) of the articles within this category.

Government involvement and policy development were the second most commonly occurring primary frames with 6 (11.3%) articles for each frame. In regard to secondary frames for the northeast region, government involvement occurred the most frequently (18.9%) and no secondary frame was the second most common (17.0%) of the articles in this region. The western region included articles from California, Colorado, Idaho, and Utah. There were 53 articles that were classified into this region. Community activism occurred the most frequently as a primary frame with 13 (24.5%) articles. Policy development was identified as the second most commonly occurring primary frame, as 11 (20.8%) articles were identified.

Community activism and policy development were also determined to be the most commonly identified primary and secondary frames in the western region with 10 (18.9%) articles falling into the community activism frame, and 9 (17.0%) articles identified as policy development.

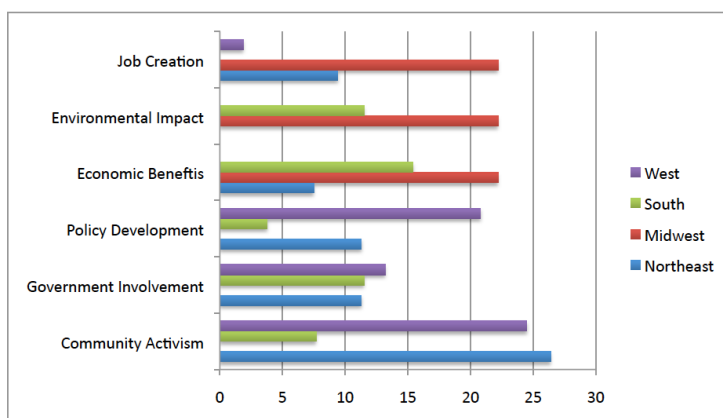
More states were categorized into the southern region than other regions in the study. Twenty-six articles were included in the southern region category. States included in the southern region were, Washington D. C., Louisiana, Maryland, West Virginia, Texas, North Carolina, Oklahoma, Arkansas, Tennessee, and Virginia. Eighteen frames were identified as primary or secondary in this regional category. Articles in the southern region were primarily framed in

terms of economic benefits as the frame occurred in four (15.4%) of the articles. Environmental impact and government involvement each occurred three times in this set of articles, making these frames the second most commonly identified primary frames.

Policy development was the most identified as the secondary frame in articles in the southern region with four articles (15.4%). Three frames tie for the second most commonly occurring secondary frame, which includes none identified, energy source, and environmental impact with three articles each (11.5%).

The final region examined in this study was the United States midwest. Articles within the study featured four midwestern states, yet this category had the fewest number of articles compared with other regions at nine total. Four states were identified as midwestern, which included Montana, Ohio, North Dakota, and Illinois. Nine different frames were identified in the articles placed in the midwest region.

Primary frames in this region were identified as economic benefits, job creation, and environmental, as each of these frames were observed in 2 (22.2%) articles each. Energy source, advertisement spending, and fracking downfall frames were each observed once (11.1%). No secondary frame was identified in the majority of the articles in this category (33.3%), but economic benefits and job creation frames were the second most common secondary frames with 2 (22.2%) articles each. The northeast region and western region both included articles primarily framed in terms of community activism. The southern and midwestern regions included articles primarily framed in terms of economic benefits and environmental impact. The regions revealed



no common secondary frames, as the secondary frames tended to vary. (Figure 3)

Figure 3. Primary Frame by Region

Articles that did not feature a certain state, or identified more than one state, were classified as national. The world classification was used when articles featured areas outside of the United States. Countries featured outside the United States included, England, Canada, Mexico, Brazil, and Russia. Articles with no indication of region or area featured were classified as unknown.

Forty-eight articles were classified as national, 12 were classified as world, and 2 were

classified as unknown. Two primary frames were identified in the national articles, which were government involvement and environmental impact (12.5% and 6 articles each). It was most common for the national articles to feature no secondary frame as 9 (18.8%) of the articles featured only a primary frame. Articles classified as world featured protest as the leading primary frame in 3 (25%) of the articles, and energy source as the leading secondary frame in 5 (41.5%) of the articles.

Conclusions

The study was limited to three years and 10 months. It is possible that different results could be yielded during a different time frame. The findings of this study are limited to the sample of articles from newspapers selected for this study. Therefore, the results cannot be generalized to newspapers beyond the sample.

The study found the number of articles used to communicate the issue of hydraulic fracturing increased each year examined in the study. Bauer (1995) suggested that science and technology issues build up to a peak of press coverage and then decline. The timeframe examined in this study appeared to reveal no signs of articles regarding the practice of hydraulic fracturing to be tapering off. In fact, the increase of articles in each passing year examined in this study may suggest the issue has not yet reached its point of maximum coverage.

It is possible that the significant increase in articles between 2010 and 2013 may be attributed to an increase in entertainment and documentary pieces that focused on the issue of hydraulic fracturing. The motion picture *Gasland* (Fox, 2010) was released in September, 2010, and *Promised Land* (Van Sant, 2012) was released in 2012 which both emphasized hydraulic fracturing as negative. Bringing the issue to the public's attention via entertainment pieces may have attributed to the increased news coverage. The finding that 144 (70.9%) of the articles were news stories and only 59 (29.1%) were feature stories is consistent with other research indicating the

media's preference of news stories over features when subject matters were time sensitive (King et al., 2006).

Conclusions related to Objective 1. A total of 22 different frames were identified in the articles included in this study by researchers. Community activism was a primary or secondary frame in 24.1% of the articles, closely followed by government involvement at 23.6%. Policy development was the next most common frame occurring in 12.8% of articles as a primary or secondary frame.

The prominent frames mentioned above suggest that hydraulic fracturing is a science issue with many political implications. As the most commonly featured frame, community activism suggests that a variety of people are taking a stand on the issue of hydraulic fracturing. The frequent use of community activism as a frame likely corresponds with citizen distress regarding the threat of values identified by Nelkin (1995), which include intrusion on individual right, potential for social control, threat to democratic values, affected interests and resistance, possibility of biohazards, morality, and tampering with nature.

Additionally, the recognition of community activism as the most commonly featured frame is consistent with findings by other scholars who suggested promotional events receive a high rate of media coverage (Oliver & Myers, 1999). The way the public reacts to the issue of hydraulic fracturing may assist in predicting the future of the issue, as public acceptance is essential to the success of any emerging technology (Druckman & Bolsen, 2011). The lack of a secondary frame in most of the articles may be due to the complicated nature of the issue. Because hydraulic fracturing is a multidimensional issue with many implications, it is possible that journalists choose to cover issues associated with the practice one at a time. Additionally, because

most of the articles in the sample were news stories, the articles tended to be shorter and the need for brevity and focus may have been in play.

The majority (77.3%) of articles were in a neutral tone, but more articles were framed negatively than positively. Most articles were classified as neutral because for the most part, articles presented both sides of the issue or cited sources representing various views the majority of the time. This finding is consistent with other research that has concluded that the news media has a tendency to report controversial and conflicting issues (Andsager (2000), Lindsey (2011), King, et al., (2006).

At the same time, the result that more articles were framed in a negative manner rather than positive can be explained by Davis (1995) who found that emphasizing potential negative consequences was more likely to influence citizens' perceptions. Additionally, it is likely that articles printed before the time period examined in this study may have been framed more positively, as science and technology issues are framed in ways that demonstrate market development or economic potential until opponents redefine the issue in negative ways (Nisbet & Huges, 2006).

The data revealed that negatively written articles were most likely to feature water contamination or pollution frames. This may be due in part to the environmental impact because of the industry, and the possible fear held by citizens concerning the endangerment of the environment and natural resources.

The findings regarding the general tone of the articles in this study also lend support to Cacciatore et al. (2012) who argued issues of science tend to become increasingly negative and driven by conflict over time. The variety of frames and sources presented provided varying viewpoints on the issue of hydraulic fracturing, but may not have always communicated factual

information on the issue. This study supports the notion that newspapers can be used as sources of information, but citizens should not consider every sentence in a news or feature story to be objective and factual information (Hagins, 2001).

Conclusions related to Objective 2. Interest groups were the most commonly cited sources as they appeared in 51.2% of the articles. The fact that interest groups were cited in over half of the articles analyzed in this study suggests that interest groups may be easily accessible for reporters. The frequency of interest groups cited also suggests the strength of the relationship between interest group leaders and the media. It is not surprising that the use of interest groups as sources corresponds with community activism as the most common frame observed in the study. Industry reps were cited as sources in 45.8% of articles included in the study. The heavy reliance on industry representatives as sources is consistent with Andrews and Caren's (2010) finding that the news media favors professional groups that utilize advocacy tactics. Given the classification of hydraulic fracturing as industry and its common association with the oil and gas industry, the use of industry representatives as sources seems appropriate.

The reliance on political leaders or elected officials as sources suggests the political aspects of hydraulic fracturing. Much like the commonality between interest groups and community activism, the use of political leaders as sources is not surprising as government involvement and policy development were commonly observed as frames. The use of elected officials and political leaders lends support to Leiss' (2001) assertion that government elites ultimately control political debate. Such an argument seems to apply to the idea of hydraulic fracturing as a political issue.

Lastly, while not in the top rankings of cited sources, it is important to note the significance of university or scientist citations within the sample. University professors or researchers

were cited over fifty times, and scientists were cited about 30 times within the sample. While Extension itself was mentioned only one time within the sample, it is interesting to note the reliance of the media on university affiliated persons overall. Past framing analysis studies have noted the lack of use of university and extension professionals (Meyers & Rhoades, 2006). Therefore, this study suggests that reporters may be relying upon university researchers and scientists more often.

Conclusions related to Objective 3. The northeastern and western regions of the United States appeared to be similar in the way stories were primarily framed, as the articles included in the study in both regions featured community activism as the primary frame. The articles from the study that were featured in the southern and midwestern regions of the United States were both primarily framed in terms of economic benefits and environmental impact.

It is possible that the midwest and south have not yet experienced as much opposition as the northeast and west, as many articles are framed in terms of economic impact until opponents redefine the issue negatively (Nisbet & Hume, 2006). The midwest, especially, has not practiced fracking for more than a few years. However, the presence of the environmental impact frame as primary suggests that the shift to more negative stories may be forthcoming. It is not surprising that there were no common secondary frames revealed when regional articles were compared, given the variety and amount of frames identified within the study.

Recommendations

Public acceptance is essential to the success of any new or emerging technology (Druckman and Bolsen, 2011). Therefore, the fracking industry needs to be willing and open to discussions with the various stakeholders involved in the issue, and demonstrate empathy for those who express concern about the issue. The data revealed that many stakeholders have varying

opinions on the issue. Now is a time for meaningful conversations between groups. Lack of attention to public concern may only amplify opposition and increase resistance to new technology. The industry should strive to be transparent in its practices as much as possible and research should be done to monitor opinions and perceptions regarding industry practices. The political implications of fracking cannot be ignored.

Environmental and other policies that may develop in regard to the practice of fracking will have effects on varying groups of people, from industry representatives to community members. It is likely that the general public will have a say in determining future policy for this issue, and because the public generally lacks total scientific understanding (Leiss, 2001), it is important for education efforts on the issue to take place. Therefore, it is recommended that community members, political leaders, and others are given access to unbiased educational information to assist in their decision making process as it pertains to the issue of hydraulic fracturing.

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Consumer Perceptions and Attitudes of Genetically Modified Foods: The Influence of Demographics through the Lens of Social Judgement Theory

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Abstract

Social judgement theory was utilized to determine if groups of individuals showed different attitudes of and perceptions toward genetically modified (GM) foods. The primary objective was to determine if any demographic groups had a wide latitude of acceptance toward GM products. Data from this study were collected from a survey of 500 Florida residents. Results showed that many demographic groups had wide latitudes of acceptance. These groups included individuals of all political affiliations, individuals aged 20-29 and 50-79, individuals with a 2 or 4-year college degree, most religious affiliations including Christians and those with no religion, and males. These groups had overall neutral opinions toward GM foods and technologies and could potentially be valuable message recipients. A few demographic groups which would not be good recipients for messages on GM foods and technologies were also identified. These included females; individuals aged 30-49 or 80+, Jewish individuals, individuals with high (graduate or professional degree) or low (high school diploma or some college) education, and individuals who have no political affiliation. Individuals in these groups would not be good recipients of messages pertaining to GM foods because they already have strong opinions about the subject.

Keywords: Genetically modified foods, genetic modification technology, social judgement theory, consumer perceptions, consumer attitudes

Introduction

The purpose of this study was to determine consumer perception and attitudes toward genetically modified foods. Genetically modified (GM) foods are those which have undergone some kind of biotechnological changes during their development. Some prominent examples of biotechnology used to modify foods are recombinant DNA technology, polymerase chain reaction, biochips, antisense technology, ribozomes, riboswitching, RNA silencing, and protein engineering (Newell-McGloughin, 2008). Regardless of the type of modification used, the end products of these procedures are all considered genetically modified.

Genetically modified foods first became widely available in the food supply in the 1990s; the most common GM foods are corn and soybeans (Newell-McGloughin, 2008). In fact, 89% of corn and 94% of soybeans are GM (USDA AERS, 2015). Other crops including cotton, canola, sugar beets, squash, and papaya are also commonly GM (Newell-McGloughin, 2008).

There are a number of reasons why foods are genetically modified. Corn is genetically modified so it is herbicide-tolerant (HT) as well as insect-resistant (Bt) (USDA AERS 2015). The purpose of making a crop HT is to allow its survival of treatment with weed-killing herbicide. For insect resistant crops, Bt stands for *Bacillus thuringiensis*. A gene from this soil bacterium is inserted into a crop, resulting in a plant which is toxic to certain insects. In the case of corn, the Bt plant is generally toxic to the corn earworm, corn rootworm, and corn borer (USDA AERS, 2015).

Despite numerous scientific reviews (Shelton, Zhao, & Roush, 2002; Nicolai, Manzo, Veronesi, & Rosellini, 2014; Tufarelli, Selvaggi, Dario, & Laudadio, 2015; National Academies of Science, Engineering, and Medicine, 2016) determining GM foods are as safe as conventionally grown foods, consumers are still wary. Much research has been performed

worldwide on consumer perception of GM foods (Costa-Font, Gil, & Traill, 2008; Prati, Pietranoni, & Zani, 2012; Frewer et al., 2013; Bawa & Anilakumar, 2013). Consumers have overall negative attribute associations with GM foods, despite their reported safety. Klerck and Sweeney (2007) found consumers are more driven by perceived risks than they are by the estimates of technical risks provided by scientists. It is additionally possible that many consumers have a positive association regarding the benefits of GM foods but are still concerned with health, environmental, and food safety risks (Hossain, Onyango, Schilling, Hallman, & Adelaja, 2003).

Previous studies have attempted to determine if there are demographic differences in the acceptance of GM foods. Studies (Siegrist, Cvetkovich, & Roth, 2000; Costa-Font & Mossialos, 2005; Hwang, Roe, & Teisl, 2005) have shown that there are differences in a number of demographic factors including gender, age, and socioeconomic status. Different groups within these demographic categories show differences in attitudes toward and acceptance of GM foods.

Several studies have shown that females are more likely to have strong anti-GM sentiments compared to males (Costa-Font & Mossialos, 2005; Frewer, Miles, & March 2002; Hallman, Hebden, Aquino, Cuite, & Lang; 2003, Hwang, Roe, & Teisl, 2005). It has been hypothesized that one reason why females are more adverse to GM foods and technologies compared to males is because the purchaser of food in a household is often more aware of food related risks, and in most cases this individual is female (Dosman, Adamowiz, & Hrudley, 2001).

Costa-Font and Mossialos (2005) showed that younger and older individuals were more adverse to GM technologies; the authors suggested this was because younger individuals had on average less education than middle aged individuals and that older individuals had less access to certain kinds of media. Additionally, Hallman et al. (2003) reported that Americans over 64 had

less approval for GM foods than younger respondents. However, this group also had less opinions overall with 27% stating that they did not know if they approved of plant based GM foods. Hwang et al. (2005) found that younger (<30 years) and older (>65 years) participants had more moderate views on GM technologies.

Several studies (Frewer et al., 2002; Hwang et al., 2005) demonstrated that compared to individuals with the highest education level, individuals with lower education rated GM technologies significantly more negatively. Hallman et al. (2003) found that individuals with a high school education were the least likely to accept GM foods while individuals with post-graduate degrees were the most likely to accept it.

At least one study has investigated the acceptance of GM foods and technologies from the aspect of religiosity (Hossain et al., 2003). This group measured how religious the participants are (i.e., how often they attend church) rather than profiling what religion individuals are.

In this manuscript, social judgement theory was used to investigate different consumer demographic groups' perceptions and attitudes toward GM foods. In this way, a demographic group's latitude of acceptance towards GM food can be assessed. Groups with a wide latitude of acceptance toward GM foods may be good recipients for messages pertaining to GM foods and technologies.

Theoretical Framework: Social Judgement Theory

Social judgement theory explores how strong attitudes can affect the way individuals evaluate a topic (Sherif & Sherif, 1967). This theory holds that individuals do not evaluate messages on argument presentation alone but evaluate messages based on the attitudes they already hold on the topic. Thus, how an individual perceives the position of an argument is relative to their own opinions about the issue. There are three core concepts in social judgement

theory. These concepts are: a) Latitudes of acceptance, rejection, and non-commitment, b) Assimilation and contrast, and c) Ego involvement (Sherif & Sherif, 1967).

Attitudes about a message can be positive (acceptance), negative (rejection), or weak/unopinionated (non-commitment). The latitude of acceptance encompasses all of the positions on an issue which a person finds acceptable. Contrarily, the latitude of rejection includes the positions a person finds objectionable. In the middle is the latitude of non-commitment. The latitude of non-commitment includes the positions a person is unsure of or have not yet made up their mind about (Sherif & Sherif, 1967). These latitudes are important because an individual who already has strong opinions on a subject will have a wide latitude of rejection; research has shown they will reject nearly all positions incongruent with their own (Sherif, Sherif, & Nebergall, 1965). Thus, if an individual already has a strong opinion it can be very difficult to change their mind.

Assimilation and contrast are misconceptions individuals have which cause them to perceive experiences from their own personal point of reference. The contrast effect occurs when individuals focus on the differences between their expectations and reality. In contrast, individuals may assimilate others opinions or attitudes as being similar to their own, even when this is not true (Perloff, 2010). Individuals judge messages from a subjective rather than objective point of view. Thus, individuals tend to overestimate the parity of a speaker's attitude with their own attitude via assimilation. Similarly, if individuals encounter an attitude with a message dissident to their own beliefs, they will overestimate the dissimilarity between their own attitude and that of the communicator (Granberg, 1993).

Ego-involvement occurs when individuals believe that an issue is related to their core values or concept of self. Individuals who are highly ego-involved have wider latitudes of rejection compared to their latitudes of non-commitment and acceptance (Sherif, Sherif, & Nebegall 1965). Ego-involved individuals will also only assimilate ambiguous messages when the arguments are aligned with their previously formed attitudes (Lord, Ross, & Lepper, 1979). Individuals who are highly ego-involved are very difficult to persuade.

Based on social judgement theory, individuals who are ego-involved or those who already have strong opinions on a subject will be less likely to assimilate messages against their preconceived attitudes. The individuals who are most likely to be persuaded are individuals who are not ego-involved and who have weak or no opinions on a subject. These individuals have a wide latitude of non-commitment and could thus be persuaded by certain messages. This study will focus on identifying individuals who have a wide latitude of non-commitment in respect to GM foods and technologies.

Purpose and Objectives

The purpose of this study was to identify groups of individuals who have a wide latitude of non-commitment regarding GM foods and technologies. These individuals will be identified by analyzing demographic data. The demographic categories are: Gender, age, education, political affiliation, and religion.

Because individuals who are ego-involved or have strong initial opinions about a subject are less likely to be persuaded, it is important to identify individuals with a wide latitude of non-commitment. Individuals with a wide latitude of non-commitment are good prospective recipients for persuasive messages pertaining to GM foods and technologies. The specific objectives of this study are to identify which groups (if any) have a wide latitude of non-

commitment regarding GM foods and technologies for the following demographic variables: Gender, age, education, political affiliation, and religion.

Methods and Analysis

The data utilized in this report were gathered using an online survey distributed by Qualtrics. The survey was distributed to 1154 Florida residents who were selected through non-probability sampling using an opt-in survey panel. Non-probability sampling is commonly used in social science research (Baker et al., 2013). However, non-probability samples are limited by selection, exclusion, and non-participation biases. Before analysis, the data were weighted to be representative of Florida demographic data, according to the 2010 U.S. census. These weighting procedures reduce the limitations associated with non-probability samples (Baker et al., 2013; Kalton & Flores-Cervantes, 2003). The final number of respondents was 500. Individuals were terminated from the survey if they did not consent to take the survey, they were under 18 years of age, or if they were not residents of Florida. This 20 minute survey asked for opinions on several topics, but this paper focuses on two: perceptions of GM food and attitudes toward GM food.

Social judgement theory was applied to determine if there are any demographic groups whose general attitude toward GM food and technologies could be considered to have a wide latitude of non-commitment. A five point Likert scale was used to rate items in this study. For this study, a value of 1 denoted “Strongly agree,” 2 was “Agree,” 3 was “Neither Agree nor Disagree,” 4 was “Disagree,” and 5 was “Strongly disagree.” Most items were presented to respondents such that the most positive answer was 1 and the most negative answer was 5. Some items were presented such that the most negative answer was 1 and the most positive answer was 5; these items were reverse coded for consistency. In this study, a response of 3 indicates

“neither agree nor disagree” for each item. Thus, demographic groups whose average response for at least 21 out of the 23 items (91%) in this study were between 2.51 and 3.49 are considered to have a wide latitude of non-commitment. These items rated between 2.51 and 3.49 will be called “relatively neutral” throughout the rest of this paper. Some demographic groups are composed of a small number of individuals, so only groups where $n \geq 25$ will be considered in the discussion.

Statistics package for the social sciences (SPSS version 22) was used to analyze data using a one-way analysis of variance (ANOVA). Differences between demographic variables was determined by using Tukey’s Honest Significant Difference (HSD) test.

Results

Overall, some statements showed significant differences between groups for all demographic variables. Groups with a wide latitude of non-commitment for each demographic category will be discussed below; group categorization determining the latitude of non-commitment can be found in Table 1.

Table 1

<i>Categorization of demographic groups’ latitudes of commitment</i>		
<u>Demographic Group</u>	<u># of items w/ avg. response 2.51-3.49</u>	<u>Wide latitude of Non-Commitment?</u>
Men (Gender)	22	Yes
Women (Gender)	15	No
20-29 (Age)	23	Yes
30-39 (Age)	19	No
40-49 (Age)	20	No
50-59 (Age)	21	Yes
60-69 (Age)	22	Yes
70-79 (Age)	21	Yes
80+ (Age)	10	No
HS Graduate (Education)	19	No
Some College (Education)	8	No
2-year degree (Education)	22	Yes

4-year degree (Education)	22	Yes
Grad/Prof School (Education)	15	No
Republicans (Political Affiliation)	22	Yes
Democrats (Political Affiliation)	22	Yes
Independents (Political Affiliation)	22	Yes
Unaffiliated (Political Affiliation)	8	No
Catholic (Religion)	21	Yes
Jewish (Religion)	11	No
Other (Religion)	22	Yes
No Religion (Religion)	22	Yes
Protestant (Religion)	22	Yes

Gender

The latitude of non-commitment results for gender are displayed in Table 1. Male respondents had a wide latitude of non-commitment with male respondents rating 22 of the 23 items as being relatively neutral (between 2.51 and 3.49). Women had much stronger opinions on GM foods and technologies, with only 15 of the 23 items rated as relatively neutral.

The results of ANOVA and Tukey's HSD test for gender for all 23 perception and attitude questions can be seen in Table 2. At $\alpha \leq 0.05$, 21 of the 23 items were significant for gender. The two items which were not significant were "*Research on GM food should be supported by the federal government*" and "*Research on GM food is essential for improving the quality of human lives.*" For each of the 21 items which showed significant differences, female responses showed more negative perceptions and attitudes toward GM foods than did males responses.

Age

The latitude of non-commitment results for age are displayed in Table 1. There were not many respondents in the 18-19 age group ($n = 17$) so this group was not considered in the analysis. Results showed that the 20-29, 50-59, 60-69, and 70-79 age groups had wide latitudes of non-commitment. The 30-39, 40-49, and 80+ age groups had stronger opinions. In particular, the 80+ age group displayed a relatively neutral mean for only 10 of the 23 items.

Demographics broken down by age can be seen in Table 3. All but 5 of the 23 statements had significant differences based on age. The 5 statements which were not significant were “*New technology used in GM food allows people to live better lives,*” “*Overall, GM food does more good than harm,*” “*I believe GM food is a possible solution for world hunger,*” “*I believe GM food provides a solution to pest and disease problems,*” and “*I believe GM food carries little risk to the person consuming them.*”

One consistent trend in the age data was individuals aged 70-79 ($n = 47$) had consistently positive perceptions and attitudes toward GM foods and technologies. Individuals aged 80+ ($n = 31$) had much more unpredictable views of GM foods. For example, this group rated some items very positively such as “*Research on GM food is essential for improving the quality of human lives*” and “*Research on GM food should be supported by the federal government*” while other items were rated quite negatively including “*I believe GM food is good/bad*” and “*I believe GM food is wholesome/not wholesome.*”

Table 2

Participant Perception and Attitudes by Gender

<u>Statement</u>	Male ($n=241$)	Female ($n=259$)	<u>Sig.</u>
	<u>Mean</u>	<u>Mean</u>	
Developments in GM food help make society better	3.07	2.61	0.000
Scientists developing GM food contribute to the well-being of society	3.14	2.72	0.000
Research on GM food should be supported by the federal government	3.29	3.21	0.467
Research on GM food is essential for improving the quality of human lives	3.18	3.07	0.322
New technology used in GM food allows people to live longer	2.97	2.60	0.000
New technology used in GM food allows people to live better lives	3.01	2.66	0.000
Overall, GM food does more good than harm	3.06	2.77	0.003

I believe GM food is good/bad	2.97	3.59	0.000
I believe GM food is healthy/unhealthy (reversed)	2.95	3.27	0.000
I believe GM food is safe/dangerous (reversed)	3.01	3.54	0.000
I believe GM food is beneficial/not beneficial	2.94	3.51	0.000
I believe GM food is wholesome/not wholesome	3.10	3.59	0.000
I believe GM food is unnecessary/necessary	3.00	3.56	0.000
I believe GM food is positive/negative	2.96	3.64	0.000
I believe GM food is important/unimportant	3.14	2.69	0.000
I believe GM food is essential/not essential	3.16	3.55	0.000
I believe that development of GM food tampers with nature	3.39	3.85	0.000
I believe GM food is a possible solution to world hunger	3.41	3.08	0.001
I believe GM food provides solutions to pest and disease problems	3.33	2.97	0.000
I believe that the growing of GM food threatens the environment	2.96	3.15	0.050
I believe GM food carries little risk to the person consuming them	3.10	2.56	0.000
I believe GM fruits and vegetables can be modified to contain higher levels of certain nutrients	3.56	3.19	0.000
I believe that GM foods are safe to consume	3.21	2.76	0.000

Table 3

Participant Perceptions and Attitudes by Age

<u>Statement</u>	<u>18-19</u> <u>(n=17)</u>	<u>20-29</u> <u>(n=81)</u>	<u>30-39</u> <u>(n=77)</u>	<u>40-49</u> <u>(n=89)</u>	<u>50-59</u> <u>(n=86)</u>	<u>60-69</u> <u>(n=71)</u>	<u>70-79</u> <u>(n=47)</u>	<u>80+</u> <u>(n=31)</u>	<u>Sig.</u>
Developments in GM food help make society better	2.34a	2.97ab	2.68a	2.97ab	2.69a	2.77ab	3.32b	2.50a	0.003
Scientists developing GM food contribute to the well-being of society	2.22a	2.97ab	2.73ab	3.11b	2.77ab	2.90ab	3.29b	3.00ab	0.010
Research on GM food should be supported by the federal government	2.79a	3.31ab	3.08a	3.47ab	2.96a	3.24ab	3.20a	4.00b	0.001
Research on GM food is essential for improving the quality of human lives	3.12ab	3.14a	3.04a	3.03a	2.93a	3.08a	3.23ab	4.00b	0.003

New technology used in GM food allows people to live longer	2.38ab	2.88ab	2.67ab	2.84ab	2.60a	2.62a	3.25b	3.00ab	0.008
New technology used in GM food allows people to live better lives	2.23	2.88	2.74	2.89	2.73	2.75	3.15	3.00	0.084
Overall, GM food does more good than harm	2.90	2.93	2.75	2.87	2.92	2.91	3.15	3.00	0.768
I believe GM food is good/bad	3.22abc	3.25abc	3.49bc	3.12ab	3.33abc	3.33abc	2.77a	4.00c	0.003
I believe GM food is healthy/unhealthy (reversed)	3.31abc	3.49bc	3.42bc	3.06ab	3.31bc	3.29bc	2.46a	4.00c	0.000
I believe GM food is safe/dangerous (reversed)	3.31ab	3.45ab	3.45b	3.07a	3.17a	3.30ab	2.79a	4.00b	0.002
I believe GM food is beneficial/not beneficial	3.38abc	3.23abc	3.50bc	3.03ab	3.34bc	3.13ab	2.62a	4.00c	0.000
I believe GM food is wholesome/not wholesome	3.52ab	3.42ab	3.51ab	3.24ab	3.37ab	3.22ab	2.84a	4.00b	0.004
I believe GM food is unnecessary/necessary	3.96bc	3.43abc	3.30abc	3.06ab	3.35abc	3.21abc	2.76a	4.00c	0.001
I believe GM food is positive/negative	2.69bc	2.80bc	2.46b	2.91bc	2.62b	2.72bc	3.35c	1.5a	0.000
I believe GM food is important/unimportant (reversed)	3.16ab	3.38b	3.13ab	3.04ab	3.07ab	2.94ab	2.57a	3.50b	0.016
I believe GM food is essential/not essential	2.31abc	2.58ab	2.52ab	2.92bc	2.49ab	2.58ab	3.29c	2.00a	0.000
I believe that development of GM food tampers with nature	4.25b	3.36a	3.60ab	3.62ab	3.75ab	3.74ab	3.30a	4.00ab	0.004
I believe GM food is a possible solution to world hunger	3.05	3.13	3.17	3.52	3.07	3.30	3.46	3.00	0.076
I believe GM food provides solutions to pest and disease problems	2.90	3.06	3.02	3.25	3.12	3.17	3.48	3.00	0.283
I believe that the growing of GM food threatens the environment	2.94ab	3.23b	3.10ab	3.19ab	2.95ab	3.16ab	2.61a	3.00b	0.063
I believe GM food carries little risk to the person consuming them	2.14a	2.86ab	2.68ab	3.05b	2.73ab	2.87ab	3.11b	2.50ab	0.014
I believe GM fruits and vegetables can be modified to contain higher levels of certain nutrients	3.26abc	3.27ab	3.03a	3.56bc	3.21ab	3.38abc	3.59bc	4.00c	0.000

I believe that GM foods are safe to consume	2.69ab	2.97ab	2.76a	3.29b	2.74a	2.96ab	3.34ab	3.00ab	0.006
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Note: Lowercase letters a, b, and c are used to denote significant differences between demographic groups for each item. Groups who share the same letter for each item are not significantly different from one another.

Education

The latitude of non-commitment results for education are displayed in Table 1. There were not enough individuals with less than a high school education ($n = 14$) to be considered in this study. Individuals with 2 and 4-year college degrees had the widest latitude of non-commitment. Individuals with a high school degree, some college, or a graduate or professional degree had stronger opinions and more narrow latitudes of non-commitment. In particular, individuals with some college had a relatively neutral mean for only 8 of the 23 items tested.

Demographic data based on education can be found in Table 4. Only significant items are displayed. Of the 23 items, 14 showed significant differences based on education. The overall trend was that individuals who listed their education as “High School Graduate” ($n = 112$), “Some College” ($n = 132$), or “Two-Year Degree” ($n = 66$) had the most unfavorable views of GM foods and technologies. Individuals who identified their education as “Four-Year Degree” ($n = 129$) or “Graduate or Professional Degree” ($n = 47$) had the most favorable views of GM foods.

Table 4

Participant Perceptions and Attitudes by Education

<u>Statement</u>	<u>Less than HS (n=14)</u>	<u>HS Grad (n=112)</u>	<u>Some College (n=132)</u>	<u>2-year degree (n=66)</u>	<u>4-year degree (n=129)</u>	<u>Graduate/ Professional (n=47)</u>	<u>Sig.</u>
Developments in GM food help make society better	2.85ab	2.59a	2.68a	2.81ab	3.10b	3.13ab	0.002
Scientists developing GM food contribute to the well-being of society	3.08abc	2.62a	2.69a	2.87b	3.20bc	3.56c	0.000
Research on GM food should be supported by the federal government	3.34ab	3.20ab	2.94a	3.31ab	3.45b	3.52b	0.008
New technology used in GM food allows people to live longer	2.86abc	2.58a	2.60a	2.68bc	3.01bc	3.27c	0.000
New technology used in GM food allows people to live better lives	2.92abc	2.60a	2.67a	2.66ab	3.06bc	3.38c	0.000
Overall, GM food does more good than harm	3.30ab	2.71a	2.66a	2.91ab	3.12b	3.44b	0.000
I believe GM food is necessary/unnecessary (reversed)	3.23ab	3.52b	3.35ab	3.50ab	3.10ab	2.82b	0.012
I believe GM food is important/unimportant (reversed)	2.91abc	3.31c	3.21bc	3.32bc	2.85ab	2.43a	0.000
I believe GM food is a possible solution to world hunger	3.13ab	2.99a	3.16a	3.16a	3.39ab	3.82b	0.000
I believe GM food provides solutions to pest and disease problems	2.96ab	2.96a	3.11ab	3.08ab	3.27ab	3.52b	0.039
I believe that the growing of GM food threatens the environment	3.19ab	3.05b	3.07b	3.22b	3.18b	2.46a	0.002
I believe GM food carries little risk to the person consuming them	2.92ab	2.81ab	2.59a	2.62ab	3.05b	3.10ab	0.006
I believe GM fruits and vegetables can be modified to contain higher levels of certain nutrients	2.96ab	3.42ab	3.19a	3.16a	3.48ab	3.82b	0.001

I believe that GM foods are safe to consume	2.91ab	2.89a	2.87a	2.69a	3.12ab	3.57b	0.001
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Note: Lowercase letters a, b, and c are used to denote significant differences between demographic groups for each item. Groups who share the same letter for each item are not significantly different from one another.

Political Affiliation

The latitudes of non-commitment results for political affiliation are displayed in Table 1. Republicans, Democrats, and Independents all had a wide latitude of non-commitment. The group composed of individuals with no political affiliation had a narrow latitude of non-commitment, with only 8 of the 23 items having relatively neutral means.

Political affiliation data is presented in Table 5. Political affiliation was significant for all variables except “*Research on GM food should be supported by the federal government*” and “*I believe GM food is a possible solution to world hunger.*” Politically non-affiliated ($n = 66$) individuals have the worst perception of GM technologies but overall good perceptions of GM foods. For example, negative responses for the items “*Scientists developing GM food contribute to the well-being of society,*” “*Research on GM food is essential for improving the quality of human lives,*” and “*New technology used in GM food allows people to live better lives*” show that politically non-affiliated individuals do not necessarily see a benefit from GM foods to society. However positive responses for “*I believe GM food is good/bad,*” “*I believe GM food is beneficial/nonbeneficial,*” and “*I believe GM food is essential/not essential*” show that these same individuals may believe that GM food is a necessary and good thing. Furthermore, this group had a negative rating for “*I believe GM food is necessary/unnecessary,*” indicating that they did not believe GM food was necessary which is incongruous with other results. Overall, Republicans rated GM foods positively. For example, slightly positive ratings for “*Overall,*

GM food does more good than harm,” “I believe GM food is wholesome/not wholesome,” and “I believe GM foods are safe to consume” indicated acceptance of GM foods and technologies.

Table 5

Participant Perceptions and Attitudes by Political Affiliation

<u>Statement</u>	Republican (<i>n</i>=136)	Democrat (<i>n</i>=195)	Independent (<i>n</i>=103)	Non- affiliated (<i>n</i>=66)	<u>Sig.</u>
Developments in GM food help make society better	2.98b	2.87b	2.82ab	2.42a	0.006
Scientists developing GM food contribute to the well-being of society	3.17b	2.94b	2.90b	2.38a	0.000
Research on GM food should be supported by the federal government	3.15ab	3.43b	3.06a	3.20a	0.051
Research on GM food is essential for improving the quality of human lives	3.18ab	3.33b	2.89a	2.75a	0.001
New technology used in GM food allows people to live longer	2.96b	2.81ab	2.68ab	2.45a	0.008
New technology used in GM food allows people to live better lives	3.10c	2.83bc	2.72ab	2.42a	0.000
Overall, GM food does more good than harm	3.18b	2.86a	2.87ab	2.59a	0.003
I believe GM food is good/bad	2.87b	2.81b	2.61ab	2.24a	0.004
I believe GM food is healthy/unhealthy (reversed)	3.09a	3.25ab	3.29ab	3.67b	0.022
I believe GM food is safe/dangerous (reversed)	3.06a	3.31ab	3.33ab	3.57b	0.057
I believe GM food is beneficial/not beneficial	2.88b	2.85b	2.71ab	2.37a	0.037
I believe GM food is wholesome/not wholesome	2.71ab	2.80b	2.51ab	2.27a	0.011
I believe GM food is necessary/unnecessary (reversed)	3.07a	3.20a	3.38ab	3.89b	0.000
I believe GM food is positive/negative	2.74ab	2.81b	2.65ab	2.29a	0.032
I believe GM food is important/unimportant (reversed)	3.20b	2.84ab	2.88ab	2.57a	0.005
I believe GM food is essential/not essential	2.67ab	2.75b	2.63ab	2.26a	0.046
I believe that development of GM food tampers with nature	3.55a	3.50a	3.67a	4.10b	0.001
I believe GM food is a possible solution to world hunger	3.29	3.30	3.21	3.00	0.242
I believe GM food provides solutions to pest and disease problems	3.31b	3.22b	2.99ab	2.83a	0.006

I believe that the growing of GM food threatens the environment	2.63a	3.23b	3.12b	3.36b	0.000
I believe GM food carries little risk to the person consuming them	2.96b	2.96b	2.67ab	2.37a	0.001
I believe GM fruits and vegetables can be modified to contain higher levels of certain nutrients	3.49b	3.45b	3.24ab	3.06a	0.013
I believe that GM foods are safe to consume	3.12b	3.08b	2.87ab	2.56a	0.003

Note: Lowercase letters a, b, and c are used to denote significant differences between demographic groups for each item. Groups who share the same letter for each item are not significantly different from one another.

Religion

The latitude of non-commitment results for religion are displayed in Table 1. Individuals who considered themselves to be an “other non-protestant religion” were not included due to the low number of individuals in this group ($n = 21$). Catholics, Protestants, individuals with no religion, and individuals who claimed “other” all had wide latitudes of non-commitment. Only Jewish individuals had a narrow latitude of non-commitment, with only 11 of the 23 items having relatively neutral means.

There were significant difference seen for religion for four items, which are shown in Table 6. These items are “*Research on GM food should be supported by the federal government,*” “*Research on GM food is essential for improving the quality of human lives,*” “*I believe GM food is positive/negative,*” and “*I believe GM fruits and vegetables can be modified to contain higher levels of certain nutrients.*” For these items, individuals who identify as Jewish have the most favorable view of GM foods. For the first 3 of the 4 listed variables, Catholics have overall less favorable views of GM foods.

Table 6

Participant Perceptions and Attitudes by Religion

<u>Statement</u>	Catholic (<i>n</i>=143)	Jewish (<i>n</i>=46)	Other (<i>n</i>=50)	No Religion (<i>n</i>=121)	Other Non- Protestant Religion (<i>n</i>=21)	Protestant (<i>n</i>=118)	<u>Sig.</u>
Research on GM food should be supported by the federal government	3.09a	3.96b	3.23a	3.33b	3.28ab	3.06a	0.000
Research on GM food is essential for improving the quality of human lives	3.12a	3.80b	2.93a	3.06a	3.48ab	2.94a	0.000
I believe GM food is positive/negative	2.86b	2.07a	2.68ab	2.75b	2.88ab	2.63ab	0.011
I believe GM fruits and vegetables can be modified to contain higher levels of certain nutrients	3.53bc	3.85c	3.04a	3.25ab	3.26abc	3.26ab	0.000

Note: Lowercase letters a, b, and c are used to denote significant differences between demographic groups for each item. Groups who share the same letter for each item are not significantly different from one another.

Discussion

Several demographic groups were identified as having wide latitudes of non-commitment. A demographic group was defined as having a wide latitude of non-commitment if at least 21 of the 23 items were given an average rating of 2.51-3.49, which was considered “relatively neutral” for this study. The demographic groups with a wide latitude of non-commitment were: individuals of all political affiliations; individuals aged 20-29 and 50-79, individuals with a 2 or 4-year college degree; most religious affiliations including Christians and those with no religion; and males. This data can help researchers determine which groups to target with

messages pertaining to GM foods and technologies. The individuals who have a wide latitude of non-commitment are the best recipients because they have the least strong attitudes toward GM foods and are thus most likely to be persuaded by a persuasive message.

Previous studies showed females are more likely to have strong anti-GM sentiments compared to males (Costa-Font & Mossialos, 2005; Frewer, Miles, & March 2002; Hallman, Hebden, Aquino, Cuite, & Lang; 2003, Hwang, Roe, & Teisl, 2005) which was confirmed by the results of this study. Females had significantly less favorable opinions of GM foods and technologies for 21 of the 23 categories.

Costa-Font and Mossialos (2005) showed that younger and older individuals were more adverse to GM technologies; the authors suggested this was because younger individuals had on average less education than middle aged individuals and that older individuals had less access to certain kinds of media. However, it should be noted that technology use has significantly changed since 2005. This change is mainly due to the advent of smart phones which allow for instant internet access almost anywhere as well as the creation of websites such as Facebook, which can be a news source allowing participation for all individuals, which was not the case in 2005. This may be why individuals aged 50-79 in this study were shown to be relatively neutral pertaining to GM foods and technologies.

Additionally, Hallman et al. (2003) reported that Americans over 64 had less approval for GM foods than younger respondents. However, this group also had less opinions overall with 27% stating that they did not know if they approved of plant based GM foods. These results coincide with the results found in our study, which showed individuals aged 50-79 had a wide latitude of non-commitment toward GM foods and technologies. Hwang et al. (2005) found younger (<30 years) and older (>65 years) participants had more moderate views on GM

technologies. Our study showed that individuals aged 20-29 and 50-79 had the most moderate views of GM foods and technologies, which is similar to the results from Hwang et al.

Several studies (Frewer et al. 2002; Hwang et al., 2005) demonstrated that compared to individuals with the highest education level, individuals with lower education rated GM technologies significantly more negatively. These results were confirmed in this study. Hallman et al. (2003) found that individuals with a high school education were the least likely to accept GM foods while individuals with post-graduate degrees were the most likely to accept it, which corroborates with the results found in this study.

At least one study has investigated the acceptance of GM foods and technologies from the aspect of religiosity (Hossain et al., 2003). However, this group measured how religious the participants are (i.e., how often they attend church) rather than profiling what religion participants consider themselves. To the best of the authors' knowledge, the perception and attitudes of GM foods and technologies in regards to political affiliation have not been explored in depth.

Conclusions

In this study, there were several groups of individuals who have a wide latitude of non-commitment and could thus be good recipients for messages on GM foods and technologies. These groups are individuals of all political affiliations, individuals aged 20-29 and 50-79, individuals with a 2 or 4-year college degree, most religious affiliations including Christians and those with no religion, and males. These groups have overall neutral opinions on GM foods and technologies.

A few groups which would not be good recipients for messages on GM foods and technologies were also identified. These include females, individuals aged 30-49 or 80+, Jewish

individuals, individuals with high (graduate or professional degree) or low (high school diploma or some college) education, and individuals who have no political affiliation. Individuals in these groups would not be good targets for messages about GM foods because they already have strong opinions about the subject. This study is helpful in determining which demographic groups could be good targets for messages pertaining to GM foods and technologies in the state of Florida. The next step would be conducting a nationally representative survey to determine what perceptions and attitudes US consumers have about GM foods.

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Marketing Power Berries: An Importance-Performance Analysis of Blueberry Attributes

Research Paper

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Marketing Power Berries: An Importance-Performance Analysis of Blueberry Attributes

Abstract

Blueberries provide the unique health benefits to consumers, and consumers' demand for blueberries has been on the rise. Although the demand is still low compared to other fruits such as apples and grapes, consumers' growing interest in blueberries has led to significant increase of blueberry acreage in the U.S., causing the supply to exceed beyond the demand. To increase blueberry sales and consumption for the benefits of both consumers' health and the blueberry industry, this study selected 18 blueberry attributes and used an online survey to examine blueberry shoppers' perceived importance and satisfaction of these attributes. An importance-performance analysis (IPA) of these attributes was conducted to provide recommendations for future blueberry marketing.

Results indicated that all examined attributes were valuable to the consumers and growers and marketers have done a fairly good job at producing good blueberries and marketing the attributes. Among the 18 attributes, price, pesticide free, and all natural should be what producers and marketers concentrate on creating a more desirable blueberry profile. Examples of recommendations include highlighting local blueberries when they are in season and lower priced, being transparent about pesticide use on blueberries and educating consumers about pesticide safety, and working with the regulatory agencies to define all natural for the food industry.

Keywords: Blueberry, fruit, marketing, satisfaction, importance, attributes, consumers.

Introduction

Blueberries provide unique health benefits to consumers (U.S. Highbush Blueberry Council, 2014b). Research has shown blueberries can improve mobility, protect the heart, improve memory, maintain eye health, and may also act as anti-cancer agents (Bornsek et al., 2012; Liu et al., 2012; Schrager, Hilton, Gould, & Kelly, 2015; Whyte, Schafer, & Williams, 2016; Whyte & Williams, 2012). Consumers' demand for blueberries has been on the rise (U.S. Highbush Blueberry Council, 2014a). This demand has led to a 33% increase of blueberry acreage in the U.S., causing the supply to exceed far beyond the demand (U.S. Highbush Blueberry Council, 2015). In addition, the consumption of blueberries in the U.S. remains low when compared to other berries and fruits such as strawberries, grapes and apples, regardless of the increasing per-capita blueberry consumption (USDA economic research service, 2015).

To increase blueberry sales and consumptions for the benefits of both consumers' health and the blueberry industry, it is important to ensure consumers are satisfied with the product (Oliver, 2010). Satisfaction with a purchase reinforces a consumer's perception about the product and reaffirms their purchase decision-making process (Oliver, 2010). Consumer satisfaction results in their repeated purchases as well as communicating their positive experiences with the product through word of mouth or social media, which ultimately benefits the producers and the industry (Oliver, 2010).

Consumers' fruit purchasing behavior is heavily influenced by the marketing decisions made by producers, marketers, wholesalers, and retailers (Poole, Martínez, & Giménez, 2007). To successfully attract consumers, both producers and marketers must develop promotional messages that emphasize the characteristics of produce that are desirable to the target consumer (Wolf, 1997). Recognizing product attributes that are important to the consumers plays a

significant role in product marketing. One study that examined the relationship between the attributes of cactus pear fruit and consumers' consumption decision revealed that the attributes of the fruits largely explained consumers' decision on their consumption of the fruit (Galati, Romeo, Crescimanno, & Schifani, 2015).

The role of agricultural communicators has been increasingly broadened from communicating agricultural production, processing and marketing to communicating about food consumption, nutrition and health (Zumalt, 2008). This study sought to provide agricultural communicators and marketers implications and recommendations for future blueberry marketing strategies and to increase blueberry consumption.

Conceptual model and literature review

Importance-performance analysis (IPA) was used as the conceptual model for this study. IPA is an easy-to-use tool for identifying the strengths and weakness of a product for marketing purposes. IPA assesses consumers' evaluation of the attributes of a product from the aspects of perceived importance and satisfaction (Martilla & James, 1977). This technique distributes product attributes using a four-quadrant graph, illustrating the importance of the attributes as well as their performance (Levenburg & Magal, 2004; Siniscalchi, Beale, & Fortuna, 2008). This graph can be used to drive the development of communication messages. Attributes falling in the top left quadrant should be concentrated on by the communicator. These attributes are important to the consumer, but the consumer is not satisfied with the attributes (Figure 1). The top right quadrant displays the attributes that are important to the consumers. The consumers are also satisfied with these attributes (Figure 1). Communicators should keep doing what they are doing to maintain consumer satisfaction of the attributes on the top right quadrant. Consumers attach only slight importance to the attributes in to the two quadrants on the bottom. Attributes in the

bottom left quadrant are perceived neither as very important nor satisfied with (Figure 1).

Communicators should put the attributes as low priority. Attributes in the bottom right quadrant were called possible overkill because consumers perceive these attributes as satisfied but not very important (Figure 1). Martilla and James (1977) stated that attributes falling in the possible overkill quadrant should not be treated as unnecessary effort. Good reasons may exist to continue with satisfying performance.

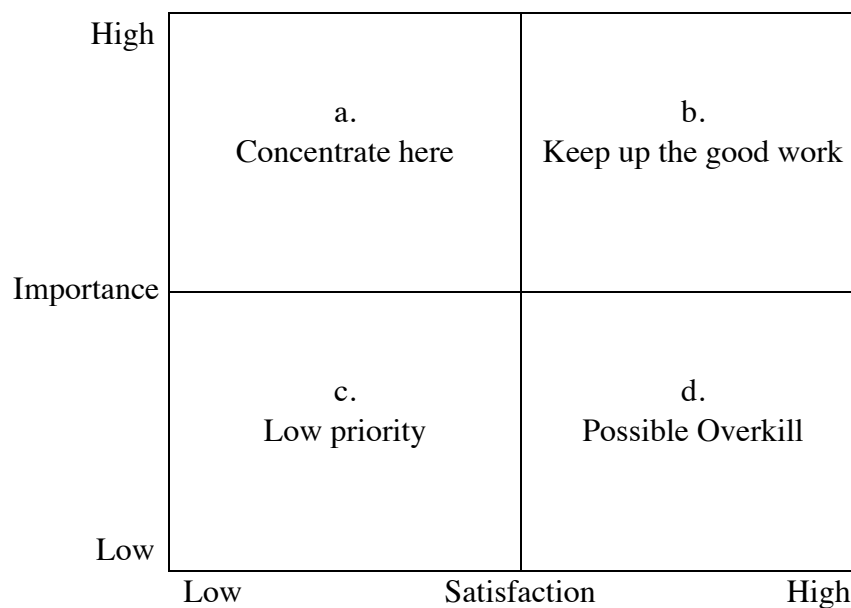


Figure 1. Importance-Performance Analysis (Martilla & James, 1977)

The comparison between consumers' perception of importance and satisfaction presented on a two-dimensional grid facilitates data interpretation and the development of marketing strategies. This technique has been used to evaluate food products and services, and have provided insights into marketing strategies for the food and agricultural industry (Back, 2012; Park, Oh, Jang, Yoon, & Cho, 2016).

Selecting the appropriate attributes is essential for the usefulness of IPA analysis (Martilla & James, 1977). The attributes selected for this study were based on the selection,

experience, and credence attributes of food (Darby & Karni, 1973; Nelson, 1970). The selection attributes are the qualities that can be identified during the search process before purchase, while the experience attributes are those that can only be revealed to the consumers as the product is used without additional cost (Nelson, 1970). Search and experience attributes of food products in the literature included color, odor, size, freshness, price, and taste (e.g. Anderson & Anderson, 1991; He, Gao, Sims, & Zhao, 2015; Manalo, 1990). In 1973, Darby and Karni proposed a third “class of properties”: credence qualities, referring to attributes that cannot be directly assessed before or during use of the product (p. 68). Since consumers generally lack technical expertise, they are usually not able to ascertain the authenticity of credence attributes in a product without extra information costs (Anderson & Anderson, 1991; Darby & Karni, 1973). Examples of credence attributes for food products can be that they are locally produced or organically produced. Without access to a growers’ location and expertise to evaluate the production method, consumers are not able to determine the authenticity of the products’ local or organic production. Other credence attributes of food product found in the literature are GMO, animal welfare, calories content, pesticide free, and all natural (Dentoni, Tonsor, Calantone, & Peterson, 2009; He et al., 2015; Hill, Sanchez, Klein, & Boueri, 2015; Hong & Wyer, 1989; Van der Lans, Van Ittersum, De Cicco, & Loseby, 2001).

Previous studies have repeatedly found that taste and freshness are the top influence on consumers’ choices related to fresh food products (Glanz, Basil, Maibach, Goldberg, & Snyder, 1998; Kearney, Kearney, Dunne, & Gibney, 2000; Ragaert, Verbeke, Devlieghere, & Debevere, 2004; Weatherell, Tregear, & Allinson, 2003). Weatherell et al. (2003) discovered that good taste and freshness were priorities for consumer food choices, followed by other attributes such as healthiness, price, local and organic production.

All natural was the second most used food label on new American food products in 2011 (Negowetti, 2013). A recent study found 31% of consumers listed “100% natural” as “the best description to read on a food label,” and 25% selected “all natural ingredients” as their top descriptor (The Shelton Group, 2011). USDA defined the term *Natural* for meat and poultry labelling in 2005 as “a product containing no artificial ingredient or added color and is only minimally processed. Minimal processing means that the product was processed in a manner that does not fundamentally alter the product” (USDA Food Safety and Inspection Service, 2015, para. 20). This definition was not intended to apply to products other than meat and poultry products. The term all natural has not been defined by U.S. food regulatory agencies such as the USDA or FDA. These terms have been used with great liberty on products of all categories and have caused lawsuits because some consumers do not believe the natural claim meets their expectation (Negowetti, 2013). One focus group study indicated participants had positive associations with the terms “all natural,” but were skeptical and confused by the all natural claims at the same time (Abrams, Meyers, & Irani, 2010).

Consumer preferences for local food has been increasing. Consumers often associate local food with supporting local producers and their local economy, as well as being environmentally friendly (Darby, Batte, Ernst, & Roe, 2008; Nimon & Beghin 1999, Loureiro, McCluskey, & Mittelhammer, 2002; Thilmany, Bond, & Bond, 2008). Additionally, consumers believe local food is of higher quality based on search and experience attributes such as freshness and taste (Byker, Rose, & Serrano, 2010; Chambers, Lobb, Butler, Harvey & Traill, 2007, Dentoni et al., 2009; Goodwin, 2013; Zepeda & Leviten-Reid, 2004). Grocery shoppers rated “more locally grown foods” as the second most desired improvement for grocery stores following “price/cost savings” (National Grocery Association, 2014, p. 26). Consumers are also

willing to pay more for locally-produced food. For example, Carpio and Isengildina-Mass (2008) found South Carolinians were willing to pay 27% more for produce grown in the state when compared to that grown in other locations. Florida consumers were also willing to pay more for Florida grown strawberries (Ruth & Rumble, 2015) compared to those grown outside the state. U.S. consumers have been found to prefer U.S. produced blueberries over imported ones, and prefer locally produced blueberries even more than those produced in the U. S. more broadly (Shi, Gao, & House, 2011). Consumers involved in the local food movement also value eating seasonal produce (Schnell, 2013) and recognize that, while this means limits to what is available, the produce they purchase and consume will be fresher and believe it to be of higher nutritional value (Schnell, 2013).

Studies have also found consumers associate value with organically produced food (e.g., Loureiro & Hine, 2002; Canavari, Nocella, & Scarpa, 2005; Bernard, Zhang, & Gifford, 2006). Consumers' believed organic food has greater nutritional benefits, is safer, and more environmentally friendly than conventionally produced food (e.g. Byrne, Bacon, & Toensmeyer, 1994; Hu, Woods & Bastin, 2009; Schifferstein & Oude Ophuis, 1998). However, other studies have found consumers did not believe organically produced food was much different from conventionally produced food in terms of health benefits (Andersen, 2009).

Whether or not food is made from genetically modified organism (GMO) is another food attribute influencing consumers' food purchase decision. Previous studies found consumers perceived GMOs not as safe or nutritious as organic options (Chassy, 2007; Lemaux, 2009). Recent studies found that more than half of American consumers believe GMOs are unsafe to eat (Funk, Raine, Smith, Olmsted, Duggan, & Page, 2015; Langer, 2013). Consumers have also expressed concern that food with GMO ingredients could have increased risk of antibiotic

resistant bacteria, increased use of pesticides, unknown toxins produced, and adverse environmental effects (Teisl, Garner, Roe, & Vayda, 2003). Consumers are willing to pay a premium for food that does not contain GMOs ingredients (Baker & Burnham, 2001; Lusk, Roosen, & Fox, 2003; Rousu, Huffman, Shogren, & Tegene, 2004).

Some consumers prefer fair trade products due to concerns about the working conditions of some factories and farms, especially in developing countries. The goal of fair trade is to eliminate or alleviate the poverty of producers, and poor or unethical working conditions such as child labor (Andorfer & Liebe, 2012). Previous research studies found consumers were willing to pay more for fair trade products such as coffee, chocolate, and bananas (Pelsmacker, Driesen, & Rayp, 2005; Rousu & Corrigan, 2008). A few studies found consumers were willing to pay more if products were produced without child labor or child abuse (Auger, Burke, Devinney, & Louviere, 2003; Rode et al. 2008). However, consumers were skeptical about whether or not farmers could be benefited by fair trade programs. Therefore, consumers were only willing to pay more for fair trade labelled products when they could see a guaranteed income increase for farmers (Basu & Hicks, 2008). Consumers' attitude toward fair trade products and their willingness to buy fair trade products were also constrained for reasons such as difficulties to identify fair trade products, higher price (Shaw, Hogg, Wilson, Shiu, & Hassan, 2006; Uusitalo & Oksanen, 2004), and travel distance to find fair trade products (Becchetti & Rosati, 2007).

Wirth, Stanton, and Wiley (2011) compared consumers' perceived importance of apple's search/experience attributes (quality, size, flavor, texture, and price) with credence attributes (produce origin, and production method). The results showed the two credence attributes were relatively unimportant compared to the search and experience attributes. Shi et al., (2011) examined consumers' willingness to pay for different attributes of blueberries. Results indicated

that consumers felt indifferent about blueberries being organic, but felt positive about blueberries' freshness and growing location. U.S. Highbush Blueberry Council (2013) has found that consumers enjoy blueberries for their health benefits, good taste, and convenience (easy to use, no peeling, etc).

Purpose and Objectives

The purpose of this study was to identify blueberry purchasers' perceived importance and satisfaction with blueberry attributes to inform future blueberry marketing strategies. The study was guided by the following objectives:

1. Identify blueberry purchasers' perceived importance of blueberry attributes.
2. Identify blueberry purchasers' perceived satisfaction with blueberry attributes.
3. Use IPA analysis to identify high importance and low satisfaction blueberry attributes.

Methods

To fulfill the purpose and objectives of this study, an online survey was used to collect data. The population of interest were adults who were responsible for the majority of the household grocery shopping. These adults were recruited from 31 U.S. states that received shipments of Florida-grown blueberries in 2015. These states were selected because this study was part of a larger project aiming to improve the marketing of Florida blueberries. An external online survey company recruited the respondents using non-probability sampling. Non-probability sampling is subject to selection, exclusion, and non-participation biases (Baker et al., 2013). To offset these biases, post-stratification weighting of the data was conducted based on the 2010 United States' Census population in seven geographic regions (Baker et al., 2013; Kalton & Flores-Cervantes, 2003). These regions were: South Atlantic (FL, GA, SC, NC, VA, WV, MD, DE), Mid Atlantic (PA, NY, NJ, CT), New England (NH, VT, ME, MA, RI), East

South Central (AL, MS, TN, KY), East North Central (OH, IN, IL, MI, WI), West South Central (AR, LA), West North Central (MN, IA, MO). The states included in the West South Central and West North Central regions were adapted to include only the states that received Florida-grown blueberries. The survey was sent to 3,100 potential participants. A total of 2,100 respondents from these 31 states provided complete and usable responses, resulting in a participation rate of 67.7%. Attention filters were inserted in the survey to ensure respondents were completing the instrument correctly.

To ensure the validity of the survey instrument, a panel of experts reviewed and approved the survey prior to data collection. The panel of experts included a professor and two assistant professors. The full professor specialized in food distribution and food economics, one assistant professor specialized in public opinions and evaluations, the other assistant professor specialized in communication of food and agricultural issues.

This study examined the consumers' perceived importance and satisfaction with blueberry attributes. Based on a literature review of the food attributes relevant to blueberries, the following attributes were selected: taste, nutrition, smell, size, color, freshness, convenience, price, perceived support of local farmers, in season, growing location, non-GMO, organic, being a fair trade product, grown in the USA, locally grown, pesticide free, and all natural.

The perceived importance of these attributes were measured on a five-point Likert-type scale (1 = *unimportant*, 2 = *slightly unimportant*, 3 = *neither important nor unimportant*, 4 = *slightly important*, and 5 = *important*). Similarly, respondents' satisfaction with these attributes were measured on a five-point Likert-type scale (1 = *unsatisfied*, 2 = *slightly unsatisfied*, 3 = *neither satisfied nor unsatisfied*, 4 = *slightly satisfied*, and 5 = *satisfied*). The mean of each attribute's perceived importance and satisfaction score were calculated and presented on an IPA

grid. To better understand and interpret respondents' quantitative response, responses were categorized into the real limit standard. The real limits set for the five-point scale to interpret the personal value were: $1.00 - 1.49 = \text{unimportant/unsatisfied}$, $1.50 - 2.49 = \text{slightly unimportant/slightly unsatisfied}$, $2.50 - 3.49 = \text{neither important nor unimportant/neither satisfied nor unsatisfied}$, $3.50 - 4.49 = \text{slightly important/slightly satisfied}$, and $4.50 - 5.00 = \text{important/satisfied}$. To position the vertical and horizontal axes on the grid, median values of the importance and satisfaction were used instead of mean values as "a true interval scale may not exist" (Martilla & James, 1977, p. 79).

Results

Perceived importance of blueberry attributes

The overall importance index of blueberry attributes ranged from 3.65 to 4.94 (Table 1). Based on the real limits, freshness, taste, color, nutrition, grown in the USA, price, all natural, and pesticide free were perceived as important. Smell, in season, locally grown, size, convenience, growing location, my purchase supports local farmer, non-GMO, fair trade product, and organic were considered slightly important.

Table 1

Importance and Satisfaction Means for Blueberry Attributes

Attributes	Importance		Satisfaction		ΔM_{i-j}
	M_i	SD	M_j	SD	
Freshness	4.94	.28	4.73	.57	0.21
Taste	4.93	.33	4.77	.53	0.16
Color	4.69	.57	4.73	.55	-0.04
Nutrition	4.65	.64	4.68	.62	-0.03
Grown in the USA	4.59	.74	4.54	.74	0.05
Price	4.57	.72	4.18	.96	0.39
All natural	4.53	.82	4.40	.86	0.13
Pesticide Free	4.51	.84	4.24	.97	0.27
Smell	4.48	.77	4.58	.68	-0.10
In Season	4.45	.82	4.48	.72	-0.03

Locally Grown	4.37	.85	4.36	.86	0.01
Size	4.34	.80	4.56	.66	-0.22
Convenience	4.32	.83	4.54	.71	-0.22
Growing location	4.18	.92	4.36	.81	-0.18
My purchase supports local farmer	4.17	.92	4.19	.88	-0.02
Non-GMO	3.83	1.29	3.91	1.05	-0.08
Fair Trade Product	3.69	1.14	3.86	.98	-0.17
Organic	3.65	1.28	3.99	1.01	-0.34

Note. Scale: 1 = *unimportant* to 5 = *important*; Satisfaction scale: 1 = *unsatisfied* to 5 = *satisfied*.

Perceived satisfaction with blueberry attributes

The overall mean satisfaction index scores ranged from 3.89 to 4.77 (Table 1). Based on the real limits, respondents were satisfied with the blueberry attributes of taste, freshness, color, nutrition, smell, size, convenience, and grown in the USA. Respondents perceive in season, all natural, locally grown, growing location, pesticide free, my purchase supports local farmer, price, organic, non-GMO and fair trade product as slightly satisfied.

IPA analysis

The grand medians for importance and satisfaction were 4.47 and 4.44 respectively, which were used to position the vertical and horizontal axes on the IPA grid (Figure 2). Three attributes, price, pesticide free, and all natural, fell into the Concentrate Here (high importance but low satisfaction) quadrant. Based on the real limits, all of these three attributes were perceived as important but only slightly satisfied.

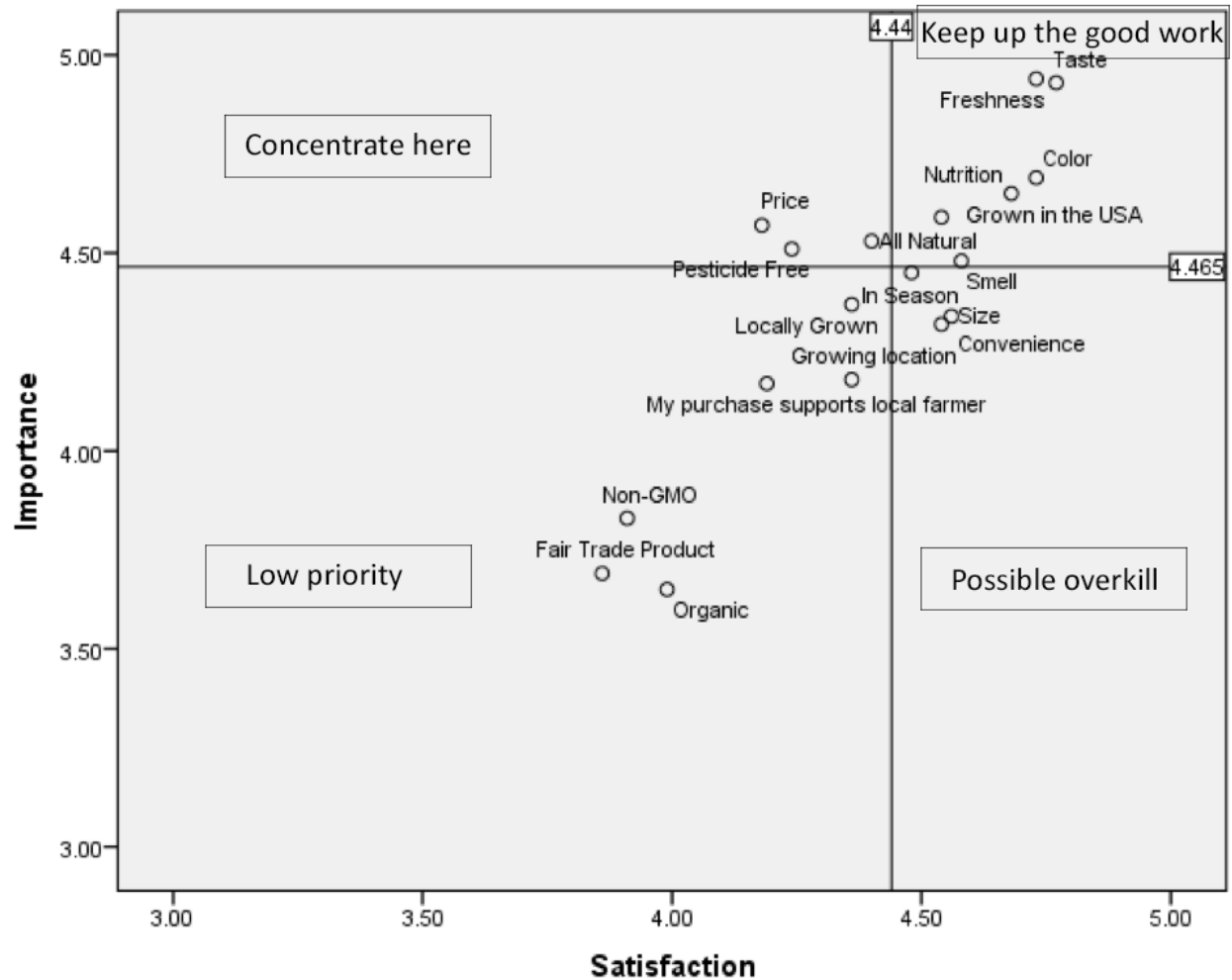


Figure 2. Importance-Performance Analysis of Blueberry Attributes

Conclusions

This study identified blueberry purchasers' perceived importance and satisfaction with 18 blueberry attributes and used IPA analysis to inform future blueberry marketing strategies. Respondents perceived all examined blueberry attributes as at least slightly important, and they were at least slightly satisfied with the attributes. This finding suggested that all examined attributes were valuable to the consumers, and also validated that blueberry growers and marketers have done a fairly good job at producing good blueberries and are marketing the attributes that are valuable to consumers.

Two of the search and experience attributes, freshness and taste, received the highest importance score. This finding aligns with previous results that taste and freshness are the top influencer on consumers' choices related to fresh food products (Glanz et al., 1998; Kearney et al., 2000; Ragaert et al., 2004; Weatherell et al., 2003). Freshness and taste also received the highest satisfaction score, indicating blueberries were produced and marketed to meet consumers' most important needs for blueberries. Price, a search attribute, was also perceived as important, but respondents were only slightly satisfied with the price of blueberries. Other search and experience attributes of blueberries (including smell, size, and convenience) satisfied the consumers and were considered slightly important.

For the credence attributes, results showed that consumers perceived the four location-related attributes (i.e. grown in the USA, locally grown, growing location, and my purchase benefits local farmers) differently. Grown in the USA was important to respondents and they were satisfied with this attribute. However, locally grown, growing location, and my purchase benefits local farmers were only perceived as slightly important and respondents were only slightly satisfied. This finding may have reflected that consumers considered growing origin more important when growing location is specified instead of only stating locally grown or supporting local growers.

Non-GMO, fair trade product, and organic were the attributes that received the lowest importance score, although they were still perceived as slightly important. Based on previous literature, consumers held skepticisms about these attributes for reasons such as not being able to guarantee the results of the stated benefits of these credence attributes (e.g. Basu & Hicks, 2008). Although these blueberry credence attributes (Non-GMO, fair trade product, and organic) were

considered slightly important, consumers valued other credence attributes more including nutrition, pesticide free, all natural, in season, and the growing location-related attributes.

Recommendations

To create a more desirable blueberry profile, blueberry producers and marketers should work on the blueberry attributes of price, pesticide free, and all natural as these three attributes fell in the concentrate here (the high importance but low satisfaction) quadrant. To improve consumers' satisfaction with blueberry prices agricultural communicators should work with marketers, wholesalers and retailers to assist them in advertising strategies that emphasizes when blueberry prices are low and encourage them to offer deals when possible such as buy one get one free. In addition, when local produce is in season, the abundance of the produce usually makes it less expensive. Highlighting local blueberries with its price is reduced could attract consumers' attention and potentially increase sales.

Agricultural communicators should also encourage marketers to know whether or not the blueberries they market are grown with or without pesticides. They could highlight pesticide free on blueberry packaging when appropriate. More importantly, blueberry marketers and agricultural communicators should be transparent about pesticide use on blueberries, educate consumers about the need for pesticide use, pesticide safety, and teach them how to properly wash blueberries. These activities and experiences could help relieve consumers' concerns about pesticide use on blueberries.

Even though no official definitions of all natural are offered by the USDA or FDA for fruits and vegetables, consumers like all natural claims and listed all natural-related labels as the best food descriptions (The Shelton Group, 2011). Taking advantage of consumers' preference for all natural claims could encourage consumers to purchase more blueberries and obtain the

health benefits from consuming blueberries (Bornsek et al., 2012; Krikorian et al., 2010; Liu et al., 2012; Whyte et al., 2016; Whyte & Williams, 2012). Agricultural communicators could work with marketers to think about how they could use “all natural” or “100% natural” on their labels when it is appropriate to remind shoppers about the nature of blueberries. Agricultural communicators may want to consider working with the regulatory agencies to further define this for the fruit industry as well so the term can be used appropriately.

Blueberry attributes of taste, freshness, color, nutrition, and being Grown in the USA are in keep up the good work (high importance and high satisfaction) quadrant. Based on the IPA model, marketers should keep doing what they are doing to maintain the high consumer satisfaction on these attributes. Based on the results, providing fresh blueberries with a ripe blue color, while emphasizing the nutrition values, could increase consumer satisfaction toward blueberries and therefore possibly increase blueberries sales. Considering consumers’ perceived importance of the Grown in the USA label when blueberries were domestically produced, marketers should include Grown in the USA on the package label. In addition, when marketing blueberries to the blueberry’s growing state, the producing state or state logo should be highlighted as previous studies have shown U.S. consumers would prefer fresh produce from their own state over those produced in other U.S. states (Carpio & Isengildina-Mass, 2008; Ruth & Rumble, 2015; Shi et al., 2013).

Non-GMO, fair trade product, organic, locally grown, and growing location fell into the quadrant of low priority. Based on the IPA model, low priority attributes should receive a low priority in resource allocation (Oh, 2001). However, considering consumers perceived these blueberry attributes as slightly important, agricultural communicators should work with

blueberry marketers, wholesalers, and retailers to keep doing what they have been doing to ensure they maintain consumers' satisfaction levels with these attributes.

This study tested consumers' perceived importance and satisfaction with 18 blueberry attributes. Each of the attributes could be extended for an in-depth study. To help researchers and marketers address the three most important attributes that exhibited the lowest level of satisfaction (price, pesticide use, and all natural), qualitative studies should be conducted to test messages with the consumer base around these three attributes. To improve consumers' satisfaction with the price of blueberries, researchers should identify appropriate focus group participants to discuss their willingness to pay for various types of blueberries such as organic blueberries, blueberries produced in consumers' home state, in the USA, and in other states. The findings could inform marketers about setting the right price for various types of blueberries.

Further research should examine consumers' perceptions of pesticide use on blueberries. These research findings could help extension educators or agricultural educators design educational materials about the science of pesticide use and take opportunities to address consumers' concerns. Agricultural communicators should also investigate how consumers prepare blueberries before consuming them in order to identify needs to educate consumers about blueberry handling procedures.

Previous research found consumers were skeptical and confused about all natural claims even though they attach positive impression to it (Abrams et al., 2010). Future research should explore consumers' understanding of all natural claims on blueberries. This could also be taken to the next level by exploring consumers' perceptions of using all natural labels on fresh produce since fresh produce share the quality of being natural in a broad sense. Such findings may push

forward the development of the definition of natural for vegetables and fruits, and may reduce consumers' confusion around the all natural claims on produce.

Finally, research could also be conducted to examine consumers' knowledge of blueberry nutrition, such as improving heart, brain and eye health. This research could be done with different age groups that have different health concerns. The findings would assist marketers to emphasize different blueberry nutritional values when marketing to different target audiences, especially for those who might be in need of those health benefits.

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Living with the Land's Agricultural and Social Media Message

Research Paper – Graduate Student

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Abstract

In 1966, Walt Disney planned for Walt Disney World parks in Florida to educate visitors about the innovations of American industries. Disney died in December of 1966, and the plans for Walt Disney World were changed. However, similar to Disney's vision, a portion of Epcot has been educating visitors about *agriculture* since 1982. The Land Pavilion at Epcot currently features three attractions and two restaurants. This research project specifically analyzed the *Living with the Land* attraction, an automated boat ride that educates visitors on agricultural topics. The researchers investigated key themes presented in the ride, how production agriculture was portrayed, and what kinds of messages were shared using *social media engagement* about the attraction. Key themes that were present in the Living with the Land ride included: bountiful harvests, innovative ideas and projects, sustainability, the environment, plant diversity, and food production. Modern production agriculture, as it would be used on a modern American farm, was not discussed. However, many innovative practices were discussed about how the Living with the Land greenhouses used advanced growing methods for lettuce and other edible plants to be served in the restaurants at Epcot. Social media conversations focused primarily on wait times for the ride and finding hidden Mickey Mouse-likenesses. Associated hashtags provided the most accurate portrayal of the ride's content. Agricultural communicators should continue to take part in evaluating agricultural exhibits and the conversations about agricultural exhibits via social media.

Keywords: agriculture, Walt Disney World, Epcot, Living with the Land, free-choice learning, social media engagement, agricultural literacy

Living with the Land's Agricultural and Social Media Message

Introduction/Purpose

In a 1966 ABC television broadcast outlining the initial plans for Walt Disney World parks in Florida, CEO Walt Disney stated that the most exciting and important part of the proposed parks would be the Experimental Prototype Community of Tomorrow, or Epcot (The Original Epcot, 2013). Disney further explained that Epcot would educate visitors about new ideas and technologies and would be a continuous work in progress to keep content up-to-date as advancements in American industry evolved. In the same broadcast, a narrator stated one of the goals of Epcot was “to create a showcase of industry at work” and that visitors would be able to “look behind the scenes at experimental prototype plants, research and development laboratories, and computer centers for major corporations” (The Original Epcot, 2013).

After Walt Disney's death in December 1966, the plans for Epcot were changed. Walt Disney's vision for Epcot was to create a working town, which would have included a suburban area, apartments, a climate controlled downtown, and an industrial park (The Original Epcot, 2013).

Because of the success of Disneyland in California, the Walt Disney Company initially created a larger clone of the iconic park first (the Magic Kingdom) for Walt Disney World, but the ideal of Epcot continued to intrigue people inside and outside the company. When Imagineers considered developing Epcot as a theme park, some wanted the park to focus on new technology, while others wanted to showcase international culture. Eventually, they pushed the two plans together and created the hourglass-shaped combination of Future World and World Showcase that we know as Epcot today. It was

Disney's first theme park not to be a Disneyland-like 'Magic Kingdom' (Murphy, 2013, para. 3).

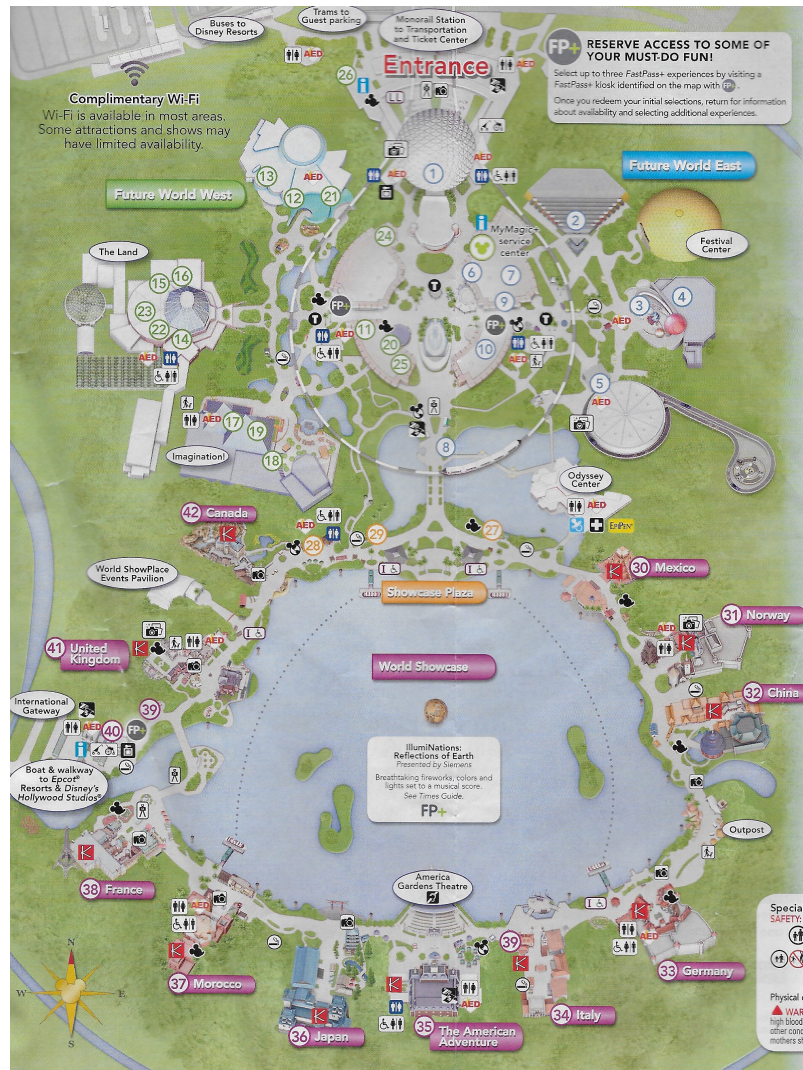


Figure 1. A map of Epcot that appeared in the Epcot Visitors Guidemap in 2015 (Disney, 2015).

Since its opening day on October 1, 1982, Epcot has been educating visitors on agricultural practices through the Living with the Land attraction located in The Land Pavilion. The Land Pavilion features two dining facilities and three attractions, including Soarin', a ride which allows guests to hang glide above California, The Circle of Life, a 20-minute film that

teaches visitors about conservation; and Living with the Land (Disney, 2015, p. Future World West). Living with the Land, originally called Listen to the Land, is a slow-paced boat ride that explains the processes needed for plant life to flourish on earth, as well as innovative technologies used by Epcot researchers and the U.S. Department of Agriculture (Lost Epcot, 2015; Walt Disney World's Epcot, 2015). The ride lasts approximately 14 minutes and extensively explains modern growing techniques used at Epcot and how the research is disseminated to farmers around the world.

Today, Epcot ranks as one of the top-ten attended theme parks globally. Epcot is consistently ranked as the third highest attended theme park nationally (Niles, 2014, p. 1) (Table 1).

Table 1

Epcot annual attendance information (AECOM, 2010-2015)

Year	Global Attendance Rank	North America Attendance Rank	Attendance
2014	6	3	11,454,000
2013	5	3	11,229,000
2012	6	3	11,063,000
2011	6	3	10,825,000
2010	5	3	10,825,000
2009	6	3	10,990,000
Total Epcot Attendance from 2009 to 2014: 66,386,000			

Living with the Land is likely one of the most viewed agricultural exhibits in the world because of the high annual tourist attendance and the longevity of the ride, since 1982. Therefore, it is necessary for agricultural communicators to understand what information is being shown to visitors of Living with the Land and then further shared on social media platforms, specifically Twitter.

Literature Review

This study incorporated free-choice learning, social media engagement, and agricultural literacy as pillars of its conceptual framework.

Free-Choice Learning

“Exhibits are among the most versatile educational media used in science communication today, reaching thousands of youth and adults in a diverse range of venues that may include schools, fairs, shopping malls, museums, and other settings” (Tucker, Bricker, & Heurta, 2015, p. 1). Previous studies have found that specific research on agriculture and applied sciences educational exhibits is lacking. Most exhibits utilize *free-choice learning*, where the individual is in control of the learning experience. Specifically, free-choice learning makes the individual think on their feet as most exhibit learning spaces are walking exhibits (Tucker, Bricker, & Heurta, 2015). Stofer found that *agriculture* is a difficult term to find in science museum exhibits, and suggested that exhibits should “emphasize Ag-STEM connections for both school children and the general adult public” (Stofer, 2015, p. 83).

Social Media Engagement

Social media engagement is a participatory form of social interaction with a form of entertainment, where the viewers experience “entirely synchronous interactivity” (Lim, Hwang,

Kim, & Biocca, 2015, p. 159). Social media engagement is typically used with television and social media studies. Previous studies have used social media engagement to investigate a wide range of topics, from sports channel loyalty to women's attachment to television characters and real-time Twitter interaction with television shows, such as *The Bachelor* (Lim, Hwang, Kim, & Biocca, 2015; Greenwood, Pietromonaco, & Long, 2008; Specht & Beam, 2015). Lim et al. (2015) further categorized social media engagement into three levels: functional, emotional, and communal. Functional engagement is the online users' real-time participation in the social media platform. Emotional engagement refers to the feelings viewers have with commentators and other viewers (Lim, Hwang, Kim, & Biocca, 2015). Communal engagement allows for viewers to feel a sense of community while communicating with others; for example, viewers of a sports team communicating with other fans of the same team. Lim et al. concluded "increased interactivity resulting from functional and communal engagement helps reduce social presence" (Lim, Hwang, Kim, & Biocca, 2015, p. 172).

Agricultural Literacy

Agricultural literacy is the knowledge a person possesses to "understand the relationship between agriculture and the environment, food, fiber and energy, animals, lifestyle, the economy and technology" (American Farm Bureau Foundation For Agriculture, 2015, para. 4). The American Farm Bureau Federation states that agricultural literacy could be "cultivated in any person, no matter the age or experience" (American Farm Bureau Foundation For Agriculture, 2015, para. 5). The concept of agricultural literacy developed as a result of growing urban sprawl from the 1970s to the early 1990s, and as "agricultural organizations realized a lack of knowledge and understanding of agriculture and agricultural processes by the general public" (Hubert, Frank, & Igo, 2000, p. 526). Educational programs that seek to educate consumers of

agricultural products about “basic principles of food and fiber sources, marketing, distribution, and nutrition,” and to educate consumers on the “impact of agriculture upon society, the economy, and the environment” are prime examples of agricultural literacy programs (Hubert, Frank, & Igo, 2000, p. 526). Some forms of spreading messages of agricultural literacy could include face-to-face conversations, educational presentations or exhibits, social media campaigns, and the use of mass media.

Purpose and Objectives

Living with the Land at Epcot provides visitors with a basic knowledge on the history of land, different land habitats, a brief history of farming, innovative agricultural practices used around the globe, and a detailed tour of several state-of-the-art research greenhouses. This ride has the potential for millions of viewers to learn about agricultural practices while it is disguised as an amusement ride. Living with the Land is an anomaly in comparison to other venues containing educational displays that have been analyzed previously. This is because visitors tour the exhibit on an automated boat ride, and are not allowed to view the exhibit at their own pace. Additionally, Living with the Land is an attraction located in an amusement park, and Epcot has more annual visitors than an average museum would have in 51.926 years, if attendance rates stayed the same as they were in 2013 (Association of Science-Technology Centers, 2014; AECOM, 2014). Since less than two percent of the United States’ population is directly involved with agricultural production, it is very likely that the vast majority of Epcot visitors are unfamiliar with agricultural practices, jargon, and advancements, which makes Living with the Land an excellent source for visitors to generate their own impressions (EPA's Ag Center, 2012).

The purpose of this study was to explore the presentation of agricultural messages and practices to the visitors of Epcot who rode Living with the Land, and what information was shared via social media by individuals who use key terms of “Living with the Land” and “Epcot” in Twitter posts. Due to the consistency of being in the top 10 theme parks visited globally and top five theme parks visited in North America annually, the researchers contend that it is important to know to what content visitors are being exposed to and what are they then disseminating from Living with the Land as an educational exhibit.

This study was intended as an overarching examination of the themes presented in Living with the Land, as well as an analysis of what social media messages are shared about the ride.

This study was guided by the following research questions:

RQ1: What information and key themes were provided to Epcot visitors who rode Living with the land?

RQ2: What specific information was provided to visitors about production agriculture, and was this information portrayed accurately in the Living with the Land attraction?

RQ3: What information was shared on Twitter by people who used the keywords “Living with the Land” and “Epcot” in their tweets?

Methods/Procedures

The main researcher on this research project travelled to Epcot in March and August 2015 to ride Living with the Land in order to verify the ride’s content. Once the researcher had viewed the content of Living with the Land, publicly posted YouTube videos were analyzed to transcribe the attraction’s pre-recorded narration. Many versions of Living with the Land are

available on YouTube over the course of several years (Theme Park Worldwide, 2015; UndercoverTourist.com, 2011). However, as the plants seasonally change in the greenhouses in The Land Pavilion, the pre-recorded transcript also changes; therefore each of the pre-recorded narrations for the videos is unique for different years and seasons (UndercoverTourist.com, 2011; iThemePark, 2013; WDWparkvideos, 2015). The transcript that was accurate for the content of the ride during this study's time frame was compared to the visual representations that are shown during the ride to determine what overarching themes and topics were present through content analysis.

Twitter information was determined by the program Sysomos MAP. Sysomos, an online social media analytics program, allowed for "real-time access to an extensive database of social and traditional media conversations, as well as detailed information about sentiment, geo-demographics and key influencers" (PR Newswire, 2009, p. 1). "Blogs, news articles, social networks, forums, video sites, and micro-blogs," including Twitter, Facebook, YouTube, Flickr, Instagram, LinkedIn and Tumblr, can be analyzed by Sysomos (PR Newswire, 2009, p. 1). Information from Sysomos for this research project was generated by searching for "Living with the Land" and "Epcot" in the main Boolean search query. This search was further filtered by adding a timeline for the search from March 1, 2015 to August 31, 2015.

The researchers were raised on conventional Midwestern farms, two on small livestock operations and the other on a large grain operation. All of the researchers have earned Bachelor of Science degrees in agriculture from land-grant institutions, and each holds at least one advanced degree in a social-scientific agricultural field from a large agricultural university.

Results/Findings

RQ1: What information and key themes were provided to Epcot visitors who rode Living with the land?

Key themes that were present in the Living with the Land ride included bountiful harvests, innovative ideas and projects, sustainability, the environment, plant diversity, and food production. *Agriculture* was only specifically mentioned three times, though clearly the purpose of the ride was to educate visitors on agricultural history and innovations for the future. While the key themes were connected to agriculture and provided a decent education on horticulture, the ride did not cover any statistical information that agricultural communicators would likely use to inform people on the challenges the agriculture industry faces to be able to feed the growing global population. The content of the ride also did not cover any information about production methods, such as conventional or organic production methods, nor did it discuss topics such as GMOs or any livestock production topics other than aquaculture. The following is a selection of key points in the transcript of the ride, as it was presented to viewers from March to August 2015:

FEMALE NARRATOR: Here at EPCOT, we are learning to reduce the need for pesticides by using natural predators, like ladybugs and wasps, to control pests.

In farmlands across America, we are learning that by plowing under vegetation containing natural fertilizers, we can enrich the soil without the use of chemicals.

MALE NARRATOR: “How will we meet tomorrow’s growing needs for food production, yet still respect the needs of the land? Some of the answers are being

discovered just ahead. To help us maintain these carefully controlled ecosystems, and for your safety, please remain seated in your boat at all times.

Welcome to our Living Laboratory, where scientists from EPCOT and the U.S. Department of Agriculture are exploring innovative ways to produce bountiful harvests now and into the future.

Innovations like this one can play an important role in our efforts to produce bountiful harvests and still protect natural resources.

These greenhouses represent just a fraction of the work being done worldwide to produce bountiful harvests for our growing population.

Scientists, farmers, and even backyard gardeners are doing their part to improve the quantity and quality of foods that we all rely upon. Together we can continue to find more ways to increase food production, and protect a precious natural environment, only then will we truly be living with the land.

On behalf of Walt Disney World, we hope you've enjoyed this unique journey through our living laboratories. If you'd like a closer look, then check out the Behind the Seeds walking tour. It's a chance for the whole family to get up close and personal with the plants and growing techniques in our laboratories (WDWparkvideos, 2015; Disney Day by Day, 2013).

RQ2: What specific information was provided to visitors about production agriculture, and was this information portrayed accurately in the Living with the Land attraction?

Production agriculture was never mentioned throughout the duration of the ride. There were some visual cues provided to visitors that the research being conducted in the greenhouses and laboratories could be applied in the future to widespread agricultural practices; however, the immediate application, or how techniques created at Epcot have already been incorporated in farming operations, was not clear from the ride's content.

The visual representation of an American farm was of an older two-story, white-sided farmhouse where a rooster was crowing from atop of a mailbox and the family dog barked from the front porch. Goats and chickens were depicted as having free roam of the yard, a windmill was situated in the corner, and a tire swing was nestled into the tree in the front yard to perpetuate a feeling of idyllic rural lifestyles (Figure 2).



Figure 2. The farmhouse and farmstead shown to riders of the Living with the Land attraction featured a rooster, dog, and chickens.

The ride continued to take visitors into the barn of the depicted farmstead, where there was limited lighting, but the scenery featured the interior of a hand-hewn barn where vintage tractors and horse saddles appeared to be ready to use. Inside the barn were large television screens that showed agricultural practices ranging from the 1940s to the 1960s, all of which were shown in black and white film (Figure 3).



Figure 3. Vintage pictures and videos demonstrated agricultural practices from decades ago in a portion of the Living with the Land ride.

A female narrator continued with the narration: “In farmlands across America, we are learning that by plowing under vegetation containing natural fertilizers, we can enrich the soil without the use of chemicals” (WDWparkvideos, 2015; Disney Day by Day, 2013). At this point in the ride, visitors obtained their only glimpse of a modern tractor. “Modern” should be loosely considered as this tractor was from the late 1980s or early 1990s (Figure 4). However, it is the only piece of machinery that even closely resembled an implement from a modern production agriculture farm.



Figure 4. The tractor shown in this image was the most modern farm implement shown during the Living with the Land ride.

The most in-depth conversation that occurred discussed the production of lettuce in the Living with the Land greenhouses. The lettuce grown in the greenhouses was served in the restaurants at Epcot, and also entertained visitors as the different varieties of lettuce were arranged to form Mickey Mouse's silhouette.

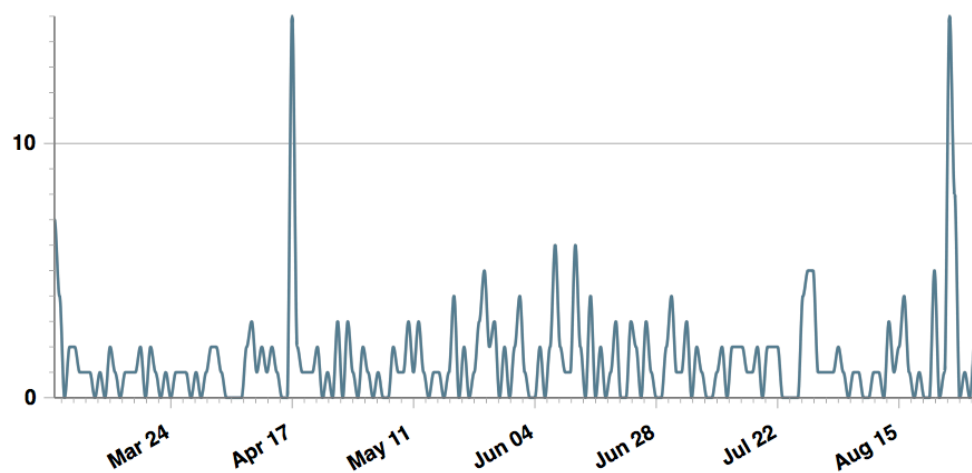
RQ3: What information was shared on Twitter by people who used the keywords “Living with the Land” and “Epcot” in their tweets?

Overall, there were 275 mentions of “Living with the Land” and “Epcot” on Twitter from March 1 to August 31, 2015. This generated an average of 1.5 Tweets per day over the course of six months. Twitter users who tweeted about “Living with the Land” and “Epcot” typically had favorable tweets about the ride. April 17 and August 25 had the highest number of Tweets with

15 Tweets respectively (Table 2). Several tweets were announcing wait times for the attraction or announcing that the individual had spotted a hidden Mickey Mouse likeness.

Table 2

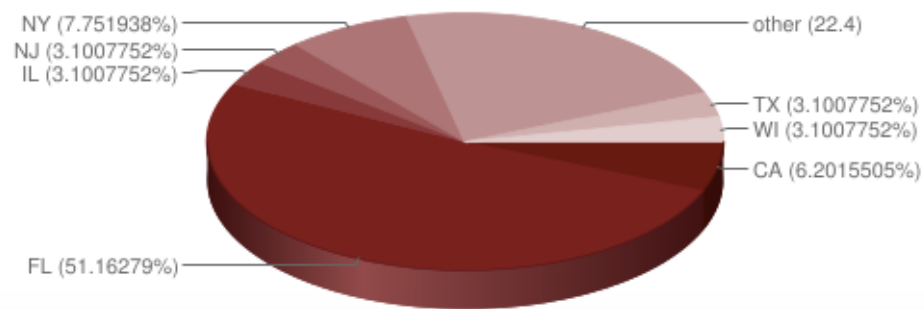
Chart of Tweets per day from March 1 to August 31, 2015, that contained the key words of “Living with the Land” and “Epcot”.



Male Twitter users represented 51.1 percent of the Tweets, while 48.9 percent of the Tweets were from women. Sysomos determined that 92.3 percent of the Tweets came from people from the United States, followed by 3.4 percent of the Tweets from the United Kingdom, 2 percent from Canada and 2.2 percent from other countries.

Figure 5

Distribution of Twitter users from the United States who tweeted about “Living with the Land” and “Epcot” between March 1 to August 31, 2015.



Of the 92.3 percent of Tweets that originated from Twitter users in the United States, 51.16 percent of those users were from Florida (Figure 5). Users from Canada had an equal representation between Nova Scotia, Ontario, and Québec.

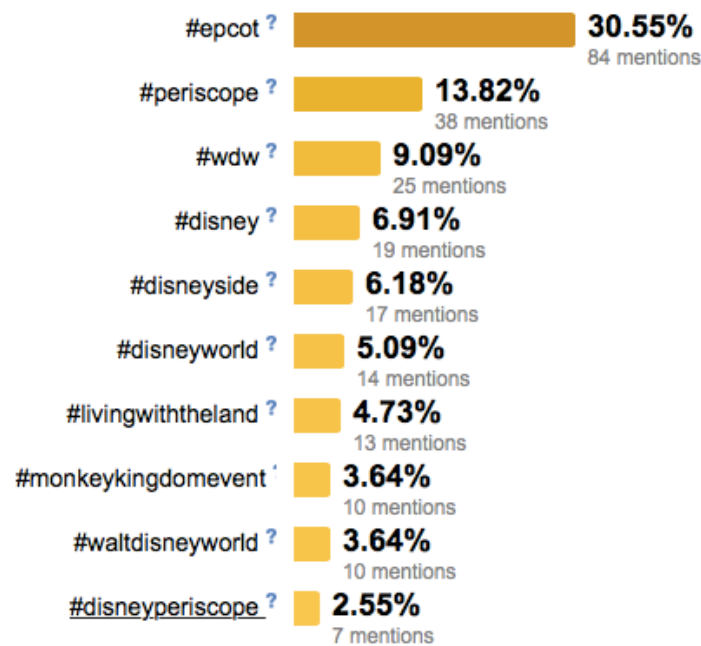
Sysomos MAP found that the most popular hashtag used to describe Living with the Land was #epcot. The use of #livingwiththeland was also popular, but the top ten hashtags did not accurately describe the content of the attraction. The top 10 hashtags were #epcot, #periscope, #wdw, #disney, #disneyside, #disneyworld, #livingwiththeland, #monkeykingdomevent, #waltdisneyworld, and #disneyperiscope (Table 3).

While no agricultural words were found in the top 10 used hashtags, some users did use agricultural content in their tweets. For instance, several users used the following hashtags to describe the Living with the Land attraction: #plants, #waterlily, #greenthumb, #happyearthday, #waterlilies, #spring, #growvegetables, #sustainable, #greenery, #flowers, #veggies, #waterlilys,

#drumgourd, #orlandofunandfood, #agriculture, #living, #tomatotree, #veggrower, and #gardening.

Table 3

Top 10 hashtags used in Tweets with Sysomos' estimated number of mentions.



Discussion/Conclusions/Recommendations

Living with the Land at Epcot provides visitors with a basic knowledge of the history of land, descriptions of different land habitats, a brief history of farming, a selection of agricultural practices used around the globe, and a detailed tour of several innovative research greenhouses. The ride has the potential for millions of viewers to learn about agricultural practices in the guise of an amusement ride. Although the information presented to viewers is not modern, or

representative of production agriculture practices frequently used by American farmers, the ride does present agricultural information many visitors might not be aware of. The use of social media to share information is becoming increasingly popular, with multiple platforms available for people to use. The high incidence of Periscope in Epcot-related tweets indicated this platform could provide valuable insight into visitors' experiences in the Living with the Land exhibit.

Despite many dated representations of agricultural practices, Epcot's Living with the Land is a useful educational display for the agricultural industry. Portions of the ride feature dated videos showcasing agriculture from around the world, while the greenhouses, aquaculture and hydroponics portion of the ride feature very futuristic and advanced practices. While more information could be incorporated to educate visitors on agricultural terms and the challenges facing the industry to sustainably grow enough food for the future global population, the information presented is likely enough for visitors who are truly interested in agricultural practices to, at the very least, participate in an additional tour of the greenhouses or to look up information on their own.

Future research should be conducted about attractions with large, diverse audiences that help educate the general public on agricultural topics in non-formal educational institutions. Specifically, agricultural communicators and educators should study attractions in places where learning is not typically associated with Ag-STEM education, such as theme parks, theatrical productions, and museums. Additionally, research should also be conducted in agriculturally related attractions, like Fair Oaks Farm in Indiana.

This research project was a portion of a larger analysis of The Land Pavilion at Walt Disney World's Epcot. Further analyses should include the dining locations, Sunshine Seasons Food Court and Garden Grill, the Behind the Seeds tour of the greenhouses shown in Living with

the Land, and the other attractions of the Soarin' ride and The Circle of Life show to better understand the complete message The Land Pavilion provides to visitors.

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Matching Local Food Messages to Consumer Motivators: An Experiment Comparing the Effects of Differently Framed Messages

Research Paper Presented at the 2017 Southern Association of Agricultural Scientists
Agricultural Communication Section

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Abstract

Past research suggests the local food movement provides economic and social benefits to consumers and producers alike. These benefits might account for the significant increase in local food sales. Despite its popularity, further communications research is needed since a dominant messaging strategy does not currently exist to advance the local food movement. Food quality, healthfulness, and support of local farmers were previously empirically identified as motivating factors to purchase local food; however, they had not been tested comparatively for effectiveness. Based in framing theory and the theory of planned behavior, we sought to test if brief messages framed to target these motivations could create positive attitudes and behavioral intent to purchase local foods among 408 study participants recruited from general education courses at a large, public university in the U.S. Results showed no difference between the message frames and no effect (compared to the control group message) on any of the measures. These findings suggest consumers are becoming increasingly savvy when it comes to local food advertisements and probably have developed a relatively stable attitude toward local food. We suggest that future research might yield deeper explanatory results if pre-existing attitudes and participants' elaboration likelihood are considered.

Keywords: Local food, framing theory, theory of planned behavior, message strength, message effects

Introduction

Supporting the local food movement is considered a noble and worthwhile endeavor for many reasons. Scholars suggest that farmers markets and local food sales can have a positive influence on small to medium sized businesses and the local community (Martinez, 2010). Local foods might also benefit rural communities both socially and economically (Brown, 2003; Lyson & Green, 1999; Schneider and Francis, 2005). Scholars further suggest that local foods could increase the consumption of fruits and vegetables (Jilcott Pitts et al., 2013; Wetherill & Gray, 2015), and could alleviate food deserts (Adams & Salois, 2010). Marketing and communication research examining effective ways in which to promote local foods, overall, to consumers is needed to continue supporting the endeavor. Practically speaking, our findings might be especially useful to small farmers and ranchers who wish to increase their market in the local food sector or create strong social ties within their community.

Although a definition of local foods is somewhat ambiguous and often personalized by individual consumers depending upon their local market and product (Cranfield, Henson, & Bandon, 2012; Martinez, 2010), several common broad purchase motivators became apparent after a comprehensive review of literature. Highlighting empirically established purchase motivators in local food messaging might invoke a stronger intent to purchase locally grown food. The literature on consumers' motivations for preferring and/or purchasing local foods is scattered across multiple disciplinary scholarly publications and no summary currently exists; therefore, details about where each study was conducted, when and how many consumers participated, methods, and conclusions were synthesized in order to conceptualize the types of information that should be included in messages to enhance persuasion. The studies' relevant details and contexts are summarized in Table 1. Following the tables is our summary and

interpretation of this body of knowledge as a whole in comparison to studies on current messaging about local food.

Table 1

Summary of research examining reasons consumers choose or prefer local food from 1998-2012

Study	Methods	Participants	Top 5 Motivating Attributes
Kezis et al. (1998)	Survey distributed at farmers market in Orono, ME.	$n = 239$ ($n = 178$ for motivations section)	Quality (72.5%) Support local farmers (59.6%) Friendly atmosphere (38.2%) Health & food safety (29.8%) Convenience (13.5%)
Food Processing Center (2001)	Survey distributed to NE, IA, MO, and WI. Question items measured on a 10-point semantic differential.	$n = 500$	Taste (mean: 9.2) Quality (mean: 8.78) Nutritious & Healthy (mean: 8.36) Price (mean: 7.93) Supports Local Farmer (mean: 7.06)
Brown (2003)	Mail survey distributed to southeast MO using simple random sampling method.	$n = 544$ (total) $n = 478$ (local food questions)	Quality & selection (45%) Locally grown (18%) Price (6%) Direct contact with grower (5%) Buying for canning/freezing (3%)
Zepeda & Leviten-Reid (2004)	Focus group setting. Participants were broken up into four groups. Two groups consisted of those who purchase organic food (alternative food shoppers) and two groups consisted of those who do not purchase organic food (conventional food shoppers).	AG 1: $n = 10$ AG 2: $n = 12$ CG 1: $n = 11$ CG 2: $n = 10$	Conventional consumer attribute importance: Freshness Flavor Long-Lasting Produce Personal Relationships Alternative consumer attribute importance: Support local farmers Sustainable Land Use Personal Health Concerns

Study	Methods	Participants	Top 5 Motivating Attributes
Schneider & Francis (2005)	Consumers and farmers were independently surveyed using mail survey in Washington County, NE. Consumer respondents were recruited using stratified random sampling. Questionnaire items related to food purchase intent were measured using a 10-point semantic differential scale	$n = 207$	Quality (mean: 8.56) Taste (mean: 8.52) Nutritious & Healthy (mean: 8.27) Price (mean: 8.15) Environmentally friendly (mean: 6.76)
Toler et al. (2009)	Field Experiment in grocery store & farmers market in Edmond, OK.	$n = 102$ total $n = 51$ grocery store $n = 51$ farmers market	Higher Quality Food (50%) Support the Local Community (33%) To Promote more Equitable Food Production Distribution System (8%) Lower Food Prices (5%)
Nurse Rainbolt et al. (2012)	Survey through WebTV or online across the U.S.	$n > 1000$	Farmers receive a fair wage (3.33) Locally grown (3.13) Organically grown (2.65)

From research examining local food marketing campaigns, environmental friendliness and sustainable production are central in the local food movement and are often used in local food marketing campaigns (Hinrichs & Allen, 2008; Lamine, 2015). However, our review of the literature shows that environmental sustainability does not seem to be an important motivating factor to purchase local foods (Brown, 2003; Kezis, Gwebu, Peavey, & Cheng, 1998; Toler et al., 2009; Nurse Rainbolt, Onozaka, & McFadden, 2012). Our assessment of the literature on motivations to purchase local foods shows that quality (Brown, 2003; Food Processing Center, 2001; Kezis et al., 1998; Schneider & Francis, 2005; Toler et al., 2009), health (Food Processing Center, 2001; Kezis et al., 1998; Schneider & Francis, 2005; Zepeda & Leviten-Reid, 2004), and

altruistic motivators (Food Processing Center, 2001; Kezis et al., 1998; Schneider & Francis, 2005; Zepeda & Leviten-Reid, 2004) are the more important factors to consider for messaging.

In the context of food messaging, researchers have found that local food labels can be multi-dimensional (McFadden, 2015), and warn that coherent branding of local foods might diminish without a clear messaging strategy (Hughes & Boys, 2015). Moreover, scholars call for further research on message frames in the local food context (Gorham, Rumble, & Holt, 2015; Ruth & Rumble, 2016), and local food labels (Jeong & Lundy, 2015). Given increasing interest in ways to promote local food systems, understanding the relative effectiveness of different local food messages eliciting those consumer motivations (quality, health, and altruism) could prove to be vitally important for those involved in agricultural communication and a continued, efficient expansion of local food markets. Our study was conducted to help alleviate concerns of diminished market power in the local food realm and help catalyze a clear branding strategy in this food sector. To address these needs, our study examined the persuasive effects of differently framed messages.

Theoretical Framework

Framing. Goffman's (1974) framing theory describes how information is presented to the public and how audience members process that information. By highlighting certain attributes, the way a message is framed can draw attention to only a few aspects of an object or issue (Weaver, 2007), and help individuals process information (Chong & Druckman, 2007). Thus, message frames make specific attributes especially salient (Scheufele, 1999). Entman (1993) points out that frames are defined by what they include as well as what they omit, while Gamson, Croteau, Hoynes, and Sasson (1992) describes frames as a latent structure that holds information together. Research on framing effects suggests the way an issue is framed can have

immense impact on public opinion (Berinsky and Kinder, 2006; Entman, 1993; McCombs & Shaw, 1993).

Message frames can be evaluated from both a macro and a micro-level perspective (Scheufele & Tewksbury, 2007). From a macro-level, framing theory describes how information about an issue is presented from communicators to various audience members (Scheufele & Tewksbury). These frames organize information and help individuals make sense of the world around them (Berinsky & Kinder, 2006; Gamson et al., 1992; Goffman, 1974; Schuldt & Roh, 2014; Scheufele, 1999). On a macro-level, frames oftentimes refer to group and cultural identity (Benford & Snow, 2000; Scheufele & Tesksbury, 2007). In the field of agricultural communication, this type of framing research has been applied to topics such as a comprehensive analysis of media coverage of organic foods revealing the frames journalists use to help audiences make sense of the topic (Meyers & Abrams, 2010).

Over time, various frames create mentally stored clusters of information (Entman, 1993). From a micro-level, framing theory describes how people use this information as they form opinions on a given issue (Scheufele & Tewksbury, 2007). Thus, message frames might invoke or activate interpretive schema (Scheufele, 2000; Weaver, 2007), which can have a strong impact on audience member's interpretation of messages (Gerber, Gimpel, Green, & Shaw, 2011; Scheufele & Tewksbury, 2009). Framing is described as highlighting certain attributes and making them more prominent than others (Druckman, 2001; Entman, 1993; Weaver, 2007), thus affecting how audiences interpret ideas. Literature on framing from a micro-level perspective is diverse as it ranges from research on equivalency value frames on ground beef labels (Levin, 1987; Levin and Gaeth, 1988) and credit cards (Ganzach and Karsahi, 1995) to scholarship on public perception of free speech during KKK rallies (Nelson et al., 1997). Research relevant to

the present study found that health, consumer preferences for a product, and versatility are important attributes in local food marketing (Gorham et al., 2015).

Theory of planned behavior. Ajzen's (1991) theory of planned behavior (TPB) takes into account attitudes toward the behavior, subjective norms, and perceived behavioral control as antecedents to behavioral intent and overt behavior. Past scholars have utilized the theory of planned behavior model in food-related research on topics such as local foods (Nurse Rainbolt et al., 2012; Ruth & Rumble, 2016), food labeling (Lorenz, Hartmann, & Simons, 2015), and organic foods (Suh, Eves, & Lumbers, 2015; Yazdanpanah & Forouzani, 2015). A comprehensive explanation of each element of the theory of planned behavior model follows.

Attitude. Attitudes describe how individuals are likely to react, or a set of behavioral tendencies, in a given social situation (LaPierce, 1934; Triandis, 1971). Attitudes can also be described as the general beliefs an individual holds toward an object or issue (Ajzen, 1991; Fishbein, 1970; Petty & Cacioppo, 1986). Attitudes toward a behavior or object consist of three components, including affective, cognitive, and behavioral components (Batra & Ahtola, 1991; Crites, Fabrigar, & Petty, 1994; Triandis, 1971). Moreover, attitudes toward an object differ in terms of overall valence and strength (Cohen, Fishbein, & Ahtola, 1972; Maio & Haddock, 2015; Petty, Briñol, & DeMarree, 2007). In this sense, attitudes are multi-dimensional (Chong & Druckman, 2007; Nelson et al., 2007). In the current study, Chong and Druckman's (2007) conceptualization of attitude was used as a "...weighted sum of a series of evaluative beliefs about that object" (p. 105).

Subjective norms. Subjective norms deal with pressure to either engage in the behavior or not engage in the behavior (Ajzen, 1991). Subjective norms exist at both the individual level and societal level as they deal with how we believe we should behave or are expected to behave

from others (Davis et al., 2015; Lapinski & Rimal, 2005; Manning, 2009; Tarkiainen & Sundqvist, 2005). Ajzen's (1991) definition of subjective norms was applied in this study as the strength of normative beliefs and the person's "motivation to comply" with the important other (p. 195).

Perceived behavioral control. Perceived behavioral control refers to our perceived ability to actually engage in the behavior under question (Ajzen, 1991). Not engaging in a behavior could be a result of limitations rather than attitudes or subjective norms around that behavior (Ajzen). Perceived behavioral control therefore has both an internal and external component (Kidwell & Jewell, 2003). The internal component is akin to Bandura's (1977) concept of self-efficacy (Ajzen & Madden, 1986; Deci & Ryan, 1987). From this perspective, perceived behavioral control predicts a greater degree of behavioral intent and overt behaviors in situations where we do not have complete volitional control to complete the behavior under consideration (Ajzen, 1991; Yang-Wallentin, Schmidt, Davidov, & Bamberg, 2004). In this study, a discrete definition of perceived behavioral control came from Ajzen (2005) as "...the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles" (p. 111).

Purpose and Research Question

Literature on motivating factors to purchase locally grown food shows that quality, health, and support of local farmers are all important attributes to consumers (Brown, 2003; Food Processing Center, 2001; Kezis et al., 1998; Schneider & Francis, 2005; Toler et al., 2009; Zepeda & Leviten-Reid, 2004). The purpose of the study was to determine and compare the persuasive effects of local food message frames of quality, health, and supporting local farmers. Using the TPB model and previous scholarship on motivating factors to purchase local foods, the

main research questions in this study were: How do health frames affect attitude, perceived behavioral control, subjective norms, and behavioral intent regarding local foods? How do quality frames affect attitude, perceived behavioral control, subjective norms, and behavioral intent regarding local foods? How do altruistic frames affect attitude, perceived behavioral control, subjective norms, and behavioral intent regarding local foods?

Methodology

A post-test only experimental design was employed to test the effects of message type with behavioral intent to purchase local foods. Each subject was randomly assigned to one of three treatment groups or the control group. Ajzen's (1991) theory of planned behavior was utilized to measure local food purchase intent among consumers.

According to Wimmer and Dominick (2013), an experimental design allows for added control of confounding variables and the ability to draw causal relationships; however, their unnatural setting is a limitation. Internal validity was controlled for through random assignment of subjects to each treatment group. To aid in the use of the findings of this study for generalizing to other populations, we gathered participants' age, gender, primary income spent on food, and weekly spending habits on food.

Construct validity was controlled for through pre-testing and manipulation checks. One-hundred twenty-five participants were used in the pre-testing phase to clarify questions in the instrument, check reliability of scales, and ensure the message frames were operating as intended. Two minor but important changes were made to the instrument as a result of the pre-testing: the phrase "conventional foods" was reworded to "non-local foods" and a perceived behavioral control item was broken into separate questions based on both cost and availability of local foods. These changes were made after participants in the pre-test phase indicated in open-

ended questions that “conventional foods” was a confusing concept and that difficulty in purchasing local foods could be the result of either cost or availability. Results from the manipulation checks showed that each frame was strong enough for participants to identify the intended emphasis of the advertisement. The response item “Local food is healthy” was measured first as the dependent variable in the manipulation check. Results show a significant difference at the $p < .05$ level among treatment groups: $F(3, 381) = 173.65, p = .00$. The second manipulation check question asked participants if they believed the ad was emphasizing quality of food. Results showed a significant difference among treatment groups once again: $F(3, 381) = 205.94, p = .00$. The third manipulation check question asked participants if they believed the ad was emphasizing support of local farmers. Results show that each frame group was statistically different from one another: $F(3, 382) = 148.59, p = .00$. All of the manipulation check results had a medium effect size that was statistically significant after performing a post-hoc comparison using the Turkey HSD. Results from the manipulations checks also showed a slight overlap between the health frame and the quality frame regarding how those frames were interpreted. This means participants may have felt similarly after viewing the quality and health frame, but overall, the manipulation checks showed that each frame type worked as intended.

Participants and Incentives

A convenience sample consisting of 392 students at a large public university participated in this study. Despite the sample of college students, findings should still prove useful. Cranfield et al. (2012) suggests that attitudes are more important than socioeconomic factors in predicting local food purchasing habits, while demographic variables do not seem to be important in predicting local food purchases (Brown, 2003). Participants were recruited on a volunteer basis via announcements through instructors of several general education courses at a large, public

university. The chance to win one of two Amazon gift cards worth \$25 and extra credit in the student's course were used as an incentive in classes where permitted by the instructor.

Independent Variables

Three messages were created as stimulus material. Literature on factors that motivate consumers to purchase local foods include food quality, health benefits, and support of local farmers (Brown, 2003; Food Processing Center, 2001; Kezis et al., 1998; Nurse Rainbolt et al., 2012; Schneider & Francis, 2005; Toler et al., 2009; Zepeda & Leviten-Reid, 2004). For each treatment group, an advertisement promoting local food including a photograph and text-based message was created.

The frame was embodied in the photo and text content. This type of frame, which includes both visuals and text, is referred to as multimodal framing (Geise & Baden, 2015). Recent research on multimodal framing shows that both visual and text based messages can have powerful effects on audience members (Geise & Baden, 2015; Powell, Boomgaarden, De Swert, & de Vreese, 2015). Because those who seek locally grown food are more likely to purchase vegetables and fruit than meat products (Food Processing Center, 2001), only images showing fruits and vegetables were chosen as stimulus material.

To ensure participants were only reacting to the frames, all other design aspects between the groups were kept consistent: layout, typography, and all other textual content not pertaining to the frame. The control group viewed an ad highlighting snow skiing. Due to the post-test only design, the fourth frame was used as a comparison for the three frames types. All visuals were selected from online databases and were chosen based on how well they represent each frame type. Visuals were also selected on aesthetic appeal and similarity in photographic style across all groups.

Dependent Variables and Questionnaire Items

Attitude, subjective norms, and perceived behavioral control were measured as dependent variables through questions drawn from previous research on purchasing intent of organic food (see Chen, 2007). Chen's (2007) questionnaire is based on Steptoe, Pollard, and Wardle's (1995) Food Choice Questionnaire that was later adopted by Bredahl's (2001) research on behavioral intent to purchase genetically modified foods. Measurements relating to behavioral intent came from consumer buying intentions of fish (see Verbeke & Vackier, 2005). All items were measured on a 7-point Likert scale ranging of 1 = strongly disagree to 7 = strongly agree.

The scales measuring the constructs under consideration were tested for reliability in this study. Removing "Local food products are more expensive than non-local foods," from the attitude assessment increased the Cronbach's Alpha coefficient from .68 to .76. A reliability test of two subjective norms statements revealed a high reliability, with a Cronbach's Alpha of .88. A reliability test of six statements measuring perceived behavioral control had the lowest reliability with a Cronbach's Alpha of .60; thus, results pertaining to this variable may not be useful since it is below .70. A reliability test of three statements measuring behavioral intent revealed a Cronbach's Alpha of .82.

Procedures

The experiment was carried out online using the survey administration program, Qualtrics. After reading an informed consent statement and agreeing to participate, students were randomly assigned to each treatment group resulting in 102 participants in the health frame group, 91 participants in the quality frame group, 95 participants in the farmer frame group, and 97 participants assigned to the control group. They were shown their assigned advertisement and instructed to examine it for at least 10 seconds because they would be asked questions about it.

After 10 seconds lapsed, the button to proceed to the next screen appeared. The next screens contained the questions measuring all of the dependent variables and followed by demographic questions. The manipulation checks appeared last.

Results

Demographics

More participants were female (53.7%, $n = 201$) than male (45.3%, $n = 178$), and three (0.8%) selected 'other' for gender. The mean age of participants was 22 years old ($SD = 3.81$ years). Most participants (62.9%, $n = 246$) indicated that they primarily pay for their food, while considerably fewer participants (36.9%, $n = 145$) indicated that someone else primarily pays for their food, such as a parent or guardian. Although not germane to the research question the present paper addresses, the only significant relationship found between these demographic variables and the dependent measures was that women (53.7%, $n = 201$) were more likely than men to have positive attitudes toward local food.

RQ 1: How do health frames affect attitude, perceived behavioral control, subjective norms, and behavioral intent regarding local foods?

RQ 2: : How do quality frames affect attitude, perceived behavioral control, subjective norms, and behavioral intent regarding local foods?

RQ 3: How do altruistic frames affect attitude, perceived behavioral control, subjective norms, and behavioral intent regarding local foods?

A MANOVA was conducted to assess the main research questions under consideration. Preliminary checks were run to test normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity. The distribution of attitude

was moderately skewed, but multivariate tests are generally robust to this violation with group sizes of at least $n = 25$ (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010).

The results showed that a significant relationship does not exist between differently framed messages and attitudes, subjective norms, perceived behavioral control, or behavioral intent to purchase locally grown food, $F(12, 1011) = 1.69, p = .064$; Wilks' Lambda = .50; partial $\eta^2 = .02$.

With attitude as the dependent variable, little variation existed among participants who were shown the quality frame ($M = 4.88, SD = .75$), those who were shown the health frame ($M = 4.79, SD = .76$), those who were shown the farmer frame ($M = 4.80, SD = .66$), and participants who were shown the control frame ($M = 4.67, SD = .91$). Likewise, with subjective norms as the dependent variable, little variation existed among participants who were shown quality frame ($M = 5.04, SD = 1.01$), the health frame ($M = 4.75, SD = .88$), those who were shown the farmer frame ($M = 4.94, SD = .81$), and the control frame ($M = 5.04, SD = .99$). Little variation in the quality frame ($M = 4.78, SD = .71$), the health frame ($M = 4.84, SD = .73$), the farmer frame ($M = 4.74, SD = .73$), and the control frame ($M = 4.63, SD = .71$) existed when perceived behavioral control was analyzed as the dependent variable. When behavioral intent was analyzed as the dependent variable, little variation existed among the quality frame ($M = 4.63, SD = 1.15$), the health frame ($M = 4.60, SD = 1.36$), the farmer frame ($M = 4.72, SD = 1.23$), and the control frame ($M = 4.50, SD = 1.21$) (Figure 1).

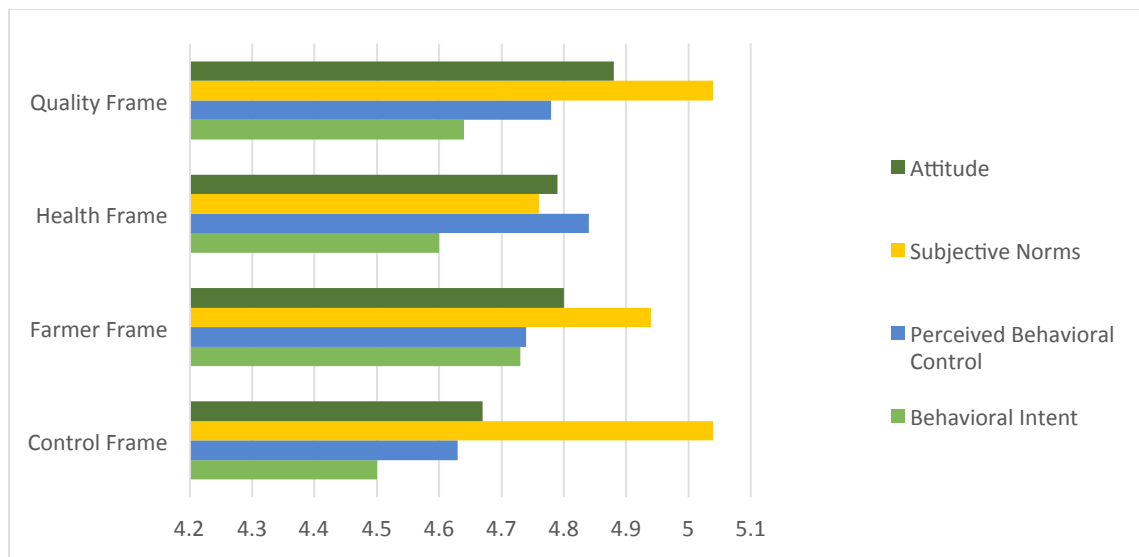


Figure 1. Relative effects of frame type on attitude, subjective norms perceived behavioral control, and behavioral intent.

A significant difference did not exist between frame type and any of the dependent variables under consideration. In general, subjective norms to purchase local foods were stronger than attitudes, perceived behavioral control, and behavioral intent to purchase local foods with the exception of the health frame. Behavioral intent to purchase local foods was the lowest of the four dependent variables for each frame type.

Discussion

Our findings run counter to recommendations from past research. The Food Processing Center (2001), Brown (2003), and Schneider and Francis (2005) all suggest highlighting quality attributes in local food marketing is influential to consumers; Gorham et al. (2015) suggests highlighting the healthfulness of local foods. Similarly, Kezis et al. (1998) and Toler et al. (2009) recommend highlighting a personal farmer-consumer relationship, while Nurse Rainbolt and colleagues (2012) suggest that farmers receiving a fair wage is important to consumers. However, none of this previous research experimentally tested messaging or did so in a manner this study pursued.

The discrepancy between recommendations from past research on local foods and the results in the current study might be explained by the brief message frames used as manipulations. Each participant only had a single exposure to the visual elements of the frame, and the text was akin to a short slogan. Brown's (2003) suggestions go beyond highlighting quality attributes around local food. She also elaborates that quality attributes should be explained to consumers as the result of an inherently short supply chain. Likewise, Nurse Rainbolt and colleagues (2012) describe the altruistic motivators behind local food purchases in terms of consumers feeling that their purchase truly makes a positive impact. Perhaps these psychological factors were not evoked strongly enough. The results of our study are similar to Costanigro, Deselnicu, and McFadden (2016) who suggest that an understanding of outcomes related to food labeling are important in increasing consumer willingness to pay for food products. Costanigro et al. further propose that well-articulated messages with clear outcomes are especially important in food-related messaging strategies. Typically, short and simple promotional messages as were used in this study are recommended as means to reach consumers in a competitive information marketplace. However, it may be the case these more simplistic promotional messages only garner attention and awareness and are insufficient to move the attitudinal needle, so to speak. In connection to the current study, we recommend those involved in local food marketing should clearly signal how local foods benefit the environment and community more specifically than making sweeping, brief claims.

When considering conventional shopping environments like grocery stores, consumers are typically able to compare locally-sourced (and marketed) foods to those that are not. Part of the explanation of our findings could also stem from presenting the local food messaging without direct comparison to non-local food options. Previous research has suggested when consumers

are comparing similar food products, on-package marketing (i.e., labels) for credence attributes (e.g., local, cage-free, sustainable) may function by decreasing consumers' positive attitudes toward the product without credence attributes rather than strongly affecting evaluations of the local product (Abrams, 2015). While more research still needs to be done to determine how consumers process and are effected by messages of comparable food products, we recommend marketers might see different results from more simplistic local food messages as used in this study when they are placed near non-local products.

Another possible explanation of the non-significant results could be a general saturation of local food campaigns, even among grocery giants. Wal-Mart has begun to market local foods (Adams & Salois, 2010), and in February of 2015, [primary regional grocery chain] was reported as the largest purchaser of local produce in [state] (Progress [State], 2015). Additionally, processors like Frito-Lay began to market products as locally grown (Adams & Salios, 2010). Certainly, the opportunity for farmers to sell their product in grocery stores could offer an economic benefit to local farmers (Aldous, 2014). However, this could be at the cost of diminished marketing power in local food campaigns by larger companies and retailers (Adams & Salios, 2010). Literature from Rikkonen, Kotro, Koistinen, Penttilä, and Kauriinoja (2013) further suggests that consumers are more likely to trust communication from small farms than large businesses. Because local foods have become more commonplace across all markets, the local food movement may have followed suit with the organic sector and lost some marketing power among consumers (Adams & Salios, 2010). While those aforementioned articles state the potential of local food messaging saturation, they had no evidence from consumer message testing. This study contributes initial insights demonstrating that saturation has led to a weakening of local food messaging.

Theoretical & Practical Implications

Our results show that each manipulation functioned as intended, evidenced by the significant result of the manipulation checks. However, participants did not exhibit any change in attitude, subjective norms, perceived behavioral control, or behavioral intent to purchase local foods using the theory of planned behavior model. To help explain this result, we compared findings with outside literature from attitude-change models.

Azjen's (1991) theory of planned behavior suggests that each element within the model can be discretely measured as acting independently of one another to predict behavioral intent. For our purposes, the construct attitude will be of primary interest as it relates to other attitude-change models. Under the theory of planned behavior, attitude is conceptualized as a summation of beliefs toward the act or object in question (Azjen). Chong and Druckman (2007) agree that attitudes are multidimensional. However, other attitude-change models take into account additional individual differences on behalf of the message receiver. These individual differences include elements such as pre-existing attitudes, attitude strength, attitude valence, and elaboration (O'Keefe, 2008; Petty & Cacioppo, 1986). Such individual differences could be vitally important in understanding why each frame had little to no impact within the participant group.

We suggest that when a pre-existing attitude is present, attitudes can be more difficult to change, even when the manipulation appears to be working correctly. A more in-depth explanation comes from Petty and Cacioppo (1986), who postulate that existing knowledge structures are incredibly important considerations in predicting attitude change, and that attitudes tend to be polarized in their initial direction. According to Smith (2012) attitude formation is much easier to achieve than attitude change. However, once the audience has received

information about an object, their attitudes can be difficult to influence (Petty & Cacioppo, 1986; Smith, 2012). Petty and Cacioppo (1986) suggest that if a pre-existing attitude is present, messages should present the audience with content that allows them to carefully process the information rather than simple cues. For attitude change to occur, the audience must receive messages which are stronger than the messages they previously received on the same issue (Petty & Cacioppo). Simple, heuristic cues, do not work well when the audience has a high need for cognition or background information on the topic (O’Keefe, 2008; Petty & Cacioppo, 1986). Given the recent growth in the local food movement as discussed by Low et al. (2015), we presume that participants were already well-aware of local foods and had formed an attitude, positive or negative, toward that sector and its products. If participants had already received information about local foods, which is possibly the case, the message frame manipulations used in this study may not have been strong enough to change participants’ initial attitude as they only incorporated simple cues rather than in-depth content.

With information about the processing systems and communication factors pertinent in each in mind, several theoretical linkages might explain the results of our study. If the participant group had already been exposed to messages about local foods, creating attitude change among those individuals would be harder to achieve. Scholars such as O’Keefe (2008), Smith (2012), and Petty and Cacioppo (1986) might suggest using higher quality messages that generate greater elaboration in this circumstance. Higher quality messages are messages that provoke the audience to carefully think about the issue under consideration, in this case the potential benefits of local foods.

If pre-existing attitudes are present and the ultimate goal is creating stable and positive attitudes toward local foods, message quality is clearly important as it invokes the audience to

more carefully consider and process the message. Findings from research on consumer preference might better explain this phenomenon. Costanigro, Kroll, Thilmany, and Bunning (2014) propose that vague messages only push consumers toward their pre-existing biases. These pre-existing biases might be akin to pre-existing attitudes as described by Petty and Cacioppo (1986). Therefore, our suggestion that simple cues are not impactful at influencing attitude change seems to be in line with literature from both the field of communications and agricultural economics. Drawing on suggestions from Costanigro et al. (2014) and Petty and Cacioppo (1986), strong messages might be more effective at creating attitude change.

Our findings suggest that local food marketers better should articulate the benefits of local food in their messaging strategy. Our manipulations worked as intended, yet were not successful in producing attitude change. Perhaps this unique finding shows that consumers are becoming increasingly savvy when it comes to local food advertisements and probably have developed a relatively stable attitude toward the local food movement. In the context of the current study, we conclude that consumers need more contextual information to understand why local foods are high quality, healthy, and support local farmers. Heuristic cues are simply not strong enough to influence actual behavioral intent to purchase local foods. However, marketers may see different results in settings in which local foods are marketed next to or near non-local foods. In this comparison setting, previous research has suggested food labels may impact consumer attitudes toward the non-local foods negatively rather than significantly enhance evaluations of the local food (Abrams, 2015). Whether that actually results in a purchase, however, is a more complicated matter based on perceived value and other extrinsic qualities of the product.

Finally, the construct overlap found between the health and quality message frames is also noteworthy to local food marketers. Results from the manipulation check showed that participants did not show a significant difference in how the health frame and the quality frame made them feel about local foods. Perhaps messages around food quality and healthfulness are one the same (i.e., inextricable features) for consumers. Messages could be streamlined to center on one or the other and have the benefits of the expanded interpretation by consumers.

Areas for Future Research

We recommend conducting a similar study using Petty and Cacioppo's (1986) elaboration likelihood model of persuasion. Such a model would alleviate several of the flaws in this study because the model would account for pre-existing knowledge structures, attitude valence and strength, and message quality.

If individuals are likely to have some existing knowledge structure on local foods, we further recommend that messages are carefully constructed and evoke higher message elaboration on behalf of study participants. For example, messages should describe why local foods are high quality. We recommend that future researchers create manipulation material with contextual information as to why local foods might be of higher quality. In direct comparison to conventional foods, this contextual information could include a shorter distance traveled from farm to plate. Likewise, the health frame should be more carefully constructed. For example, message strength could be increased by providing consumers with findings from Freedman, Choi, Hurley, Anadu, and Hébert (2013) and Jilcott Pitts et al. (2013) who suggest that those who frequently purchase locally grown food are more likely to consume nutrient-dense foods, which are related to numerous long-term health benefits (Kadey, 2015). In future studies, the support of local farmers frame could be made stronger by incorporating findings from Lyson and

Green (1999), Brown (2003), Schneider and Francis (2005), and Martinez (2010), who all suggest that local foods creates community-level benefits and increases farm income.

As local food campaigns continue to saturate the marketplace, message strength and quality become paramount in reaching the target audience. Hopefully, more research is conducted in this realm as a better understanding of local food messaging might lead to greater marketing power by small farmers and ranchers who wish to enter into or increase their presence in the local food sector. The local food movement could create strong social ties within communities, and boost income among small producers.

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Identifying Publics in Florida, California, and Texas as they Relate to Citrus Greening

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Abstract

Citrus greening is a critical issue facing the agricultural industry in the United States. The disease has been identified in residential and commercial areas, and there is a need to identify best practices in communicating with the public about the disease. The Situational Theory of Publics (STOPs) was used to guide this study. The theory was used as a type of audience segmentation to determine how to best communicate with target consumers. The purpose of the study was to determine the types of publics present in the citrus producing states of Florida, California, and Texas as it relates to citrus greening. An online survey was completed by 1,541 respondents in the states of interest. The majority of respondents in all three states had low issue involvement and high knowledge related to citrus greening. The publics were categorized as active, aware, aroused, and inactive, and differences were noted across demographic categories. There were also differences in the types of publics present across states; Florida had the largest percent of active publics. Communication in Florida should use call to actions to encourage specific behaviors from the active public, but agricultural communicators in Texas and California need to focus messages and campaigns on increasing issue involvement for citrus greening. Future research should focus on testing messages about citrus greening and conducting focus groups to gain a greater understanding of consumers' information seeking behaviors related to the disease.

Keywords: *citrus, citrus greening, publics, situational theory of publics, critical issues*

Introduction

Audience segmentation involves categorizing people from one general public into smaller, homogenous public clusters and is often used in communication campaigns. These smaller publics share common beliefs, values, and attitudes (Slater, 1995), which allows organizations to strategically plan how to best utilize resources to communicate (Dibb, 1999). Since specific audiences have specific motivators, targeting communication efforts can further encourage behavioral changes (Kotler, Roberto, & Lee, 2002).

The number of critical issues affecting agricultural and natural resources industries are vast (Environmental Protection Agency [EPA], 2016) with many that can be addressed through human intervention. Audience segmentation has been used in the past to develop strategic communication around agricultural and natural resource issues to encourage behavioral and attitudinal changes with specific audiences (Gorham, Lamm, & Rumble, 2014; Layman, Doll, & Peters, 2013; Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011; Monaghan, Ott, Wilber, Gouldthorpe, & Racevskis, 2013). A recent issue facing the agricultural industry is citrus greening.

In 2005, the citrus disease Huanglongbing (HLB) was identified in Florida (UF/IFAS Citrus Extension, 2016). The disease is commonly referred to as citrus greening due to the discoloration of the fruits caused by the bacterium. Infected trees have misshapen, small, green fruit that are bitter to taste. After infection, the overall productivity of trees declines over the years. Florida produced over 130 million boxes of oranges in the 2012/2013 season but only 90 million boxes of oranges in the 2014/2015 season (U.S. Department of Agriculture-National Agricultural Statistics Service [USDA-NASS], 2016a). By 2016, all commercial and residential citrus growing counties in Florida had been affected (UF/IFAS Citrus Extension, 2016). Florida

is the number one citrus producing state in the United States (US), but its orange production is predicted to continue to decrease due to citrus greening in upcoming seasons (USDA-NASS, 2016b). California is the second highest producer of oranges with nearly 50 million boxes in the 2014/2015 season (USDA-NASS, 2016a). Growers hoped that citrus greening would not make it to California but the first case was identified in the summer of 2015 (Ferris, 2015). The only other major citrus producer in the US, Texas, does not produce nearly as high a yield as Florida or California; however, they were not immune to citrus greening. The insect-spread disease arrived in Texas in 2012 (Herrick, 2012). With all three major citrus producing states infected, the \$3.3 billion US citrus industry is in jeopardy (USDA-NASS, 2015).

Florida's citrus industry alone has lost over \$4 million and 8,000 jobs due to citrus greening between 2007 and 2011 (Hodges & Spreen, 2012). The California citrus industry has yet to experience the negative impacts of citrus greening (USDA-NASS, 2015) due to how new the disease is to the area. However, the effects of the disease could devastate California's \$1.9 billion citrus industry (USDA-NASS, 2015) and 22,000 employees (Citrus Pest and Disease Prevention Program [CPDPP], 2016). Texas is the number one producer of grapefruit in the US, which can also be affected by citrus greening, and its total citrus industry contributed \$55 million in 2015 (USDA-NASS, 2015). The value of the Texas citrus industry dropped \$15 million since the disease arrived in 2012. If citrus greening continues to spread throughout these states, the effects could be detrimental and US citrus industry may completely collapse. One of the major problems with citrus greening is there is currently no cure or affordable management practice available to growers (Singerman & Useche, 2016). However, early detection and tree quarantine can help stop the spread from one tree to another (University of California, Agriculture and Natural Resources [UC-ANR], 2016).

The disease has been identified in both residential and commercial areas (UC-ANR, 2016; UF/IFAS Citrus Extension, 2016), therefore increasing public awareness of the disease will be critical in helping to stop its spread. Some of the behaviors that are encouraged to protect citrus is to get people living in residential areas to inspect their trees for insect damage, only purchase trees from reputable nurseries, and call state specialists if they believe their tree has been infected (CPDPP, 2016). An aware and active public is needed to help stop the spread of citrus greening in residential areas and to support government funded research initiatives in the commercial sector. Previous research has explored communication strategies when reaching out to producers affected by citrus greening (Telg et al., 2012), but how to communicate about citrus greening with the public has been unexplored. The purpose of this research was to identify the types of publics in Florida, California, and Texas in regards to citrus greening.

Conceptual Framework

Dewey (1927) originally defined publics as groups of people faced with the same problem and collaborating to address an issue. Using that definition, Grunig and Repper (1992) differentiated between publics and stakeholders by stating stakeholders are chosen by organizations to be marketed and communicated to while publics develop organically and actively seek information about an issue from an organization. However, Grunig (1983) proposed there is not one set public. Depending on the issue, publics will actively, passively, or simply not communicate (Grunig, 2005). The Situational Theory of Publics (STOPs) further elaborated on this hypothesis and explored why there are both passive and active publics. Identifying differences in types of publics could aid in the development of appropriate communication methods dependent upon the situation (Grunig, 1983).

Grunig (1983) identified four different types of publics: nonpublics, latent publics, aware publics, and active publics. Nonpublics are not exposed to an issue or problem, while latent publics are exposed to the issue but do not recognize it as an issue. Aware publics recognize a problem exists but do not take action, and active publics recognize a problem and take action. What type of public a person is categorized into is dependent upon their level of issue involvement, problem recognition, and constraint recognition (Grunig, 1983). Issue involvement is how people are able to connect themselves to a problem personally, while problem recognition requires a person to be aware of a problem that affects them. Constraint recognition is an individuals' perception regarding whether or not they can do anything about the problem. Those who are high in involvement and issue recognition but low in constraint recognition for a situation are categorized as active publics. Conversely, those with low problem recognition and involvement and high constraint recognition are considered non-publics (Rawlins, 2006).

Depending on the type of public, different communication strategies should be implemented (Table 1; Rawlins, 2006). For those in the active public, communication should be behavior oriented and include a call to action. These people are considered advocate stakeholders and will likely take action such as providing endorsements, making donations, and letter writing. Dormant stakeholders are the portion of the aware public that are not quite ready to become involved in an issue. Sometimes inactivity is due to lack of knowledge or not seeing the personal connection with the issue. Communication for this public should focus on increasing knowledge or personal relevance accordingly. Finally, apathetic stakeholders represent the latent public and simply are not aware an issue exists. Communication with this group should aim at increasing the saliency of the issue and inviting members to become involved in addressing the problem (Rawlins, 2006).

Table 1

Rawlin's (2006) Categorization of Stakeholders

<i>Type of Stakeholder</i>	<i>Type of Public</i>	<i>Communication Strategy</i>
Advocate	Active Public	Call-to-action, behavior oriented
Dormant	Aware/Aroused	Increase knowledge/personal relevance
Apathetic	Latent	Increase issue involvement

Hallahan (2000) expanded on STOPs and specifically explored the role of the inactive public in public relation strategies, arguing that it is most often overlooked or forgotten. Hallahan (2000) explored the roles of issues involvement and knowledge and how they predicted consumers' responses to communication. Active publics have high issue involvement and high knowledge (Table 2; Hallahan, 2000, p. 504), try to affect change, and initiate conversations with organizations about issues. Communication with this group should encourage open dialogue and address leaders of the public. Aware publics have high knowledge and low involvement and are unlikely to communicate about the issue unless they would benefit personally from the communication. This group could hold influence in the community and its behavior should be monitored. Communication should encourage (or discourage depending on the issue) this group to act as influencers and supply it with more information on the issue (Hallahan, 2000).

Table 2

Hallahan's Categorization of Types of Publics

	Low Involvement	High Involvement
High Knowledge	Aware Publics	Active Publics

The latent public identified by Grunig (1983) was split into inactive and aroused publics (Hallahan, 2000). The aroused public was characterized by low knowledge and moderate/high issue involvement. This group has some familiarity with the issue and will seek information to reduce related perceptions of risk. Hallahan (2000) recommended communicators research the source of this group's arousal and frame messages related to the public's concern of the issue.

People with low knowledge and low issue involvement were labeled as the inactive public. Inactive publics are unlikely to seek information on an issue outside their own personal needs or without being prompted (Hallahan, 2000). Therefore, organizations have to be proactive in providing this public with information. By motivating this public to learn more about an issue and increasing their knowledge on the topic, organizations can also build positive relationships with inactive publics. Organizations have to find ways to facilitate opportunities to communicate with the inactive public and enhance their motivation to process the information (Hallahan, 2000).

Major (1998) used STOPS to determine how to communicate to publics after a natural disaster. Interpersonal discussion related to the problems made people feel more connected to the problem and have higher problem recognition. Rather than use traditional outlets like newspapers and television to convey information about a natural disaster, Major (1998) suggested using social networking platforms, like community centers and churches, to increase interpersonal communication when developing community response plans. Additionally, messages should include specific risks related to the community to help increase problem recognition (Major, 1998). Roser and Thompson (1995) found that using fear appeals in

messages caused publics to respond emotionally if they already had a level of emotional involvement in the issue. Additionally, the researchers determined that emotional arousal drove publics to become active.

Aldoory, Kim, and Tindall (2010) also used STOPs to explore how shared risk experiences influence risk communication. The researchers determined that if viewers could identify similarities between themselves and the victims or spokesperson of food terrorism in a news story, their issue involvement increased. The researchers concluded that the media could heighten awareness of an issue, which would lead to consumers exhibiting behaviors to protect themselves against potential risks. Recommendations included using sources in media coverage that share similarities with the audience (Aldoory et al., 2010).

Purpose and Objectives

The purpose of this study was to identify and understand the types of publics in Florida, Texas, and California as it relates to citrus greening to provide insight into how to develop communication campaigns that will resonate and get the publics to take action. The following objectives guided the research:

1. Describe respondents' issue involvement and knowledge associated with citrus greening.
2. Describe respondent characteristics based on the public category they fall within as it relates to citrus greening.
3. Describe the types of publics present in Florida, California, and Texas related to citrus greening.

Methods

Survey methodology was used to fulfill the purpose of this manuscript. Purposive, non-probability sampling methods were used to collect the sample for the study. Residents 18 years and older of Florida, California, and Texas were selected as the population of interest due to the states' high citrus production (USDA-NASS, 2015). Additionally, citrus greening has been identified in all three states (Ferris, 2015; Herrick, 2012; UF/IFAS Citrus Extension, 2016). The online survey company, Qualtrics, delivered the survey to 2,757 potential respondents. Quota questions were asked at the beginning of the survey to ensure equal response between states and two attention filter questions were used to alleviate issues with respondents randomly selecting answers. After incomplete responses were discarded, there were 1,541 usable responses that met the quota and passed the attention filter questions for a participation rate of 55.9%.

This study used nine questions, in addition to demographic questions, from a larger survey for analysis. The face and construct validity of the instrument was assessed by a panel of experts. Additionally, a pilot study was used to identify any issues with the instrument. All the constructs in the study were found to be reliable at a Cronbach's alpha of .70 (Field, 2013). The survey was open from September 24, 2015 to October 7, 2015 to avoid a history effect on the respondents' answers.

Hallahan's (2000) definition of publics was used for this study. Respondents were categorized as having high or low issue involvement and knowledge and coded as belonging in the active, aware, aroused, or inactive public. The constructs for issue involvement and knowledge were researcher developed. Issue involvement was measured with a four-item, five-point bipolar semantic differential scale. Scales with at least four items are considered internally reliable (Harvey, Billings, & Nilan, 1985; Hinkin & Schriesheim, 1989). Statements included, "I am very

concerned about citrus greening disease/ I am not at all concerned about citrus greening disease” and “I am bothered by citrus greening/ I am not bothered by citrus greening.” Positive statements were coded as a five and negative statements were coded as a one. An index was created by summing each item and calculating the average. A dichotomous variable for issue involvement was created. Respondents were considered to have *high issue involvement* if their mean on the index was equal to or higher than the average for the sample ($M = 3.30$, $SD = .95$). *Low issue involvement* was coded as anything below the sample mean for issue involvement.

Five knowledge questions asked respondents about how citrus greening was spread, where it originated, what part of the tree it infected, symptoms of citrus greening, and what states were infected (Florida, California, Texas, or none). A count variable was created for the knowledge construct; each correct answer counted as one point. The scale ranged from zero (no knowledge) to five (complete knowledge). If respondents answered at least three questions correctly, they were coded as having *high knowledge*. *Low knowledge* included respondents answering between zero and two questions correctly.

Publics categories were coded depending on respondents’ knowledge and issue involvement. Those with high knowledge and high issue involvement were coded as active publics, and high knowledge and low involvement were coded as aware publics. Aroused publics included respondents with low knowledge and high involvement, and inactive publics included low knowledge and low involvement respondents (Hallahan, 2000).

Demographic questions asked about age, sex, education, income, and race (check all that apply). A full description of respondents can be seen in Table 3. The majority of the respondents were over the age of 45 and female. Approximately one-third of the respondents had a four-year college degree and an annual income of \$75,000 or more. The majority of the sample were white

and one-tenth were hispanic. Approximately one-third of respondents had children living in their home.

Table 3

Description of Respondents (n = 1,541)

Category	%
Age	
18-24	2.4
25-44	26.8
45-64	40.4
65+	30.4
Gender	
Female	52.6
Male	47.4
Education	
High School or less	14.6
Some College	23.2
2-year College Degree	11.8
4-year College Degree	33.0
Graduate or Professional School	17.5
Income	
\$25,000 >	15.2
\$25,000 -\$49,999	24.6
\$50,000 -\$74,999	22.9

\$75,000 -\$149,999	28.6
\$150,000 or more	8.7
Race	
White	88.6
African American	5.5
Other	7.6
Hispanic	10.9
Children in Home	32.7

All data were analyzed in SPSS. Descriptive statistics were used in objectives one and two. For objective one, the data were split by state to determine the issue involvement and knowledge of respondents in Florida, California, and Texas separately. Two Chi-square tests were used to explore the association between state and knowledge and issue involvement. The data file was split in objective two to analyze the demographic characteristics of each public. Descriptive statistics and Chi-square tests were used to fulfill objective three. *Post hoc* tests were used to determine where statistical differences existed between the states.

Results

Problem Recognition, Issue Involvement, and Constraint Recognition

Examining the respondents within each state separately, Florida, California, and Texas had a similar percent of respondents with high knowledge of citrus greening (Table 4); and a Chi-square test was not statistically significant between knowledge and states ($X^2(2) = 5.587, p = .061$). However, there was a statistically significant association between states and issue involvement ($X^2(2) = 6.972, p = .031$). The majority of respondents in the three states did not

express high levels of issue involvement, but *post hoc* tests revealed Florida had a larger proportion of high issue involvement respondents compared to California or Texas.

Table 4

Problem Recognition, Issue Involvement, and Constraint Recognition in California, Florida, and Texas

	California	Florida	Texas
	(<i>n</i> = 523)	(<i>n</i> = 516)	(<i>n</i> = 502)
Category	%	%	%
High Issue Involvement	42.4 _a	49.8 _b	43.0 _a
High Knowledge	60.0	62.8	55.6

Note. Identical subscripts across public category indicate no statistical differences between states ($p < .05$).

Description of Publics

The largest age groups in active, aware, and inactive publics were respondents between the ages of 45 and 64 (Table 5). The largest proportion of aroused respondents were between the ages of 25 and 44, which was nearly twice the proportion of that age group in the active public. The majority of active and aware publics were female, and the majority of aroused and inactive publics were male. Education across the publics were similar; the largest proportion of respondents in each category had earned a 4-year college degree. The publics also had similar distribution of race (majority were white) and ethnicity. However, the aroused and inactive publics had larger proportions of Hispanic respondents compared to the other public categories. The aroused public was the only one where the majority of respondents had children living at home.

Table 5

Description of Respondents in Each Public

Characteristic	Active (<i>n</i> = 438) %	Aware (<i>n</i> = 479) %	Aroused (<i>n</i> = 257) %	Inactive (<i>n</i> = 367) %
Age				
18-24	1.1	2.5	2.7	3.5
25-44	17.1	21.7	46.7	31.1
45-64	45.7	43.4	31.5	36.5
65+	36.1	32.4	19.1	28.9
Gender				
Female	54.8	56.8	49.4	46.9
Male	45.3	43.2	50.6	53.1
Education				
High School or less	13.0	12.9	17.1	16.9
Some College	22.8	23.4	24.5	22.3
2-year College Degree	13.7	11.7	7.0	13.1
4-year College Degree	34.0	33.4	34.6	30.0
Graduate or Professional School	16.4	18.6	16.7	17.7
Income				
\$25,000 >	16.4	16.3	12.2	14.4
\$25,000 -\$49,999	25.3	25.5	19.8	25.9

\$50,000 -\$74,999	24.4	19.8	25.7	23.2
\$75,000 -\$149,999	27.2	31.3	27.2	27.8
\$150,000 or more	6.6	7.1	15.2	8.7
Race				
White	89.3	88.7	89.1	87.2
African American	5.5	4.6	6.2	7.1
Other	7.5	7.7	7.4	7.1
Hispanic	10.5	6.5	16.7	13.1
Children in Home	25.3	22.1	52.5	32.7

Types of Publics in California, Florida, and Texas

Florida was the only state with the highest proportion of respondents identified as active (Table 6). The largest public in both California and Texas was aware. A quarter of respondents in California and Texas, and one-fifth of respondents in Florida, were identified as part of the inactive public. There was a statistical association found between type of public and geographic location ($\chi^2(6) = 13.21, p = .04$). The only statistical difference between states was that Florida had a larger proportion of active public respondents compared to California or Texas.

Table 6

Types of Public in California, Florida, and Texas

	California	Florida	Texas
	(<i>n</i> = 523)	(<i>n</i> = 516)	(<i>n</i> = 502)
	%	%	%

Active	27.3 _a	33.3 _b	24.5 _a
Aware	32.7 _a	29.5 _a	31.1 _a
Aroused	15.1 _a	16.5 _a	18.5 _a
Inactive	24.9 _a	20.7 _a	25.9 _a

Note. Identical subscripts across public category indicate no statistical differences between states ($p < .05$).

Discussion, Implications, and Recommendations

This study sought to explore the types of publics in Florida, California, and Texas in regards to citrus greening to inform how to communicate with target audiences most effectively. The majority of respondents across all three states exhibited low issue involvement, which indicates a need to increase the personal relevance of citrus greening to consumers in citrus producing states. California and Texas had a smaller portion of respondents with high issue involvement compared to Florida. Citrus greening has been present in Florida for over a decade (UF/IFAS Citrus Extension, 2016) and residents of the state may have been exposed to more news coverage or personal stories about the disease and feel involved with the issue as a result. The majority of the respondents had high knowledge of citrus greening; however, only five knowledge questions were asked (a limitation of the study), and respondents could have been guessing the answers rather than displaying true knowledge.

Research has shown that highlighting similarities between groups, such as family values and personal needs, can increase issue involvement among the public (Aldoory et al., 2010). Therefore, to increase issue involvement of citrus greening in all three states, agricultural communicators should publish news articles that covers stories of individual growers affected by citrus greening and make the impacts of the disease personal. In addition, to help people feel more connected to the issue of citrus greening, interpersonal communication can be promoted through the use of social networking (Major, 1998), which can include in person and online

communication. Communicators in Texas, Florida, and California should focus on increasing issue involvement by framing messages around how important the citrus industry is to the state and to individual farm owners. Another way to increase issue involvement is to use spokespersons with similar psychological and physiological characteristics as the target audience (Aldoory et al., 2010). For example, a communication campaign targetting families should use a spokesperson who is a mother or father to increase issue involvement from the public.

The largest proportion of the aroused public were between the ages of 25 and 44. This public represents the apathetic stakeholders (Rawlins, 2006). To target this age group, communication with the purpose of increasing awareness of citrus greening could be distributed in community areas that are frequented by this demographic such as local farmers markets, groceries, community centers, and town forums. Since the majority of active and aware respondents were women, they will also need to be targetted specifically. These publics represent dormant and advocate stakeholders, and communication with them should provide a call to action (Rawlins, 2006). Additionally, about a quarter of these publics had children, and framing the issue of citrus greening around the effects of not having orange juice available for children could increase the personal relevancy of the issue (Rawlins, 2006) and create an emotional response to the potential decrease in orange juice availability (Roser & Thompson, 1995). Using women in interviews about citrus greening in the news or to serve as a spokesperson could also increase issue involvement (Aldoory et al., 2010). A call to action in the communication should focus on women who serve as leaders in their community to influence others' perceptions and awareness of citrus greening (Hallahan, 2000). Additionally, using two-way communication in social media platforms like Twitter, Facebook, and Instagram will encourage open dialogue amongst the active public to encourage them to exhibit specific behaviors (Major, 1998).

Education level amongst the publics was relatively uniform. This finding indicates that education level holds little affect on the type of public in regards to citrus greening. However, the aroused public had nearly twice the proportion of respondents earning more than \$150,000 a year compared to the other publics. This public has high issue involvement but low knowledge (Hallahan, 2000). Communication can be distributed in affluent neighborhoods to target this group of publics. Communicators will need to research the source of arousal for the group and ensure messages target the consumers' concerns related to citrus greening (Hallahan, 2000). Since the majority of the aroused public had children, communication should be family-focused. Additionally, information about citrus greening could be taught to children in a formal school setting, which could lead to discussions in the family about citrus greening and increased knowledge. Increasing the knowledge of this group is important to help guide the public from being aroused to active. Communicators need to increase knowledge or issue involvement to create an active public that can help lead to behavioral changes that mitigate the effects of citrus greening (Grunig, 1983).

Florida was the only state to have the highest percentage of respondents fall into the active public category due to it having the largest proportion of respondents with high issue involvement and high knowledge of citrus greening (Hallahan, 2000). This high percent of an active public is likely the result of Florida being the top citrus producing state in the US (USDA-NASS, 2016b) and the presence of citrus greening in the area for the past ten years (UF/IFAS Citrus Extension, 2016). The consumers in Florida should be interested in taking action regarding citrus greening, and agricultural communicators should focus their communication on encouraging specific behaviors (Rawlins, 2006), which could include reporting infected trees (CPDPP, 2016) or making donations for research efforts. General awareness campaigns should

be used as well to increase problem recognition for consumers who are not part of the active public.

California respondents had the largest proportion of respondents categorized as aware and the smallest proportion as the aroused public. Communicators in California should focus messaging on increasing issue involvement and knowledge to help decrease the percent of aroused and inactive publics and increase the percent of aware and active publics. Texas had a slightly larger percentage aroused and inactive publics compared to California and Florida. This finding also supported Hallahan's (2000) hypothesis that low issue involvement and low knowledge would lead to an uninvolved public. This group is not likely to seek information about a topic outside their personal needs (Hallahan, 2000). Communication in Texas will need to focus on increasing a sense of issue involvement and address issue knowledge in general (Hallahan, 2000).

Further research could include conducting focus groups or interviews to gain an in-depth understanding of consumers' perceptions of citrus greening. Collecting questions, quantitatively or qualitatively, on consumers' information seeking behaviors regarding citrus greening would also provide greater insight into the types of publics present (Grunig, 1989). Message frames focusing on consumer values versus knowledge of citrus greening should also be tested to determine their effect on issue involvement and knowledge. This study explored the publics identified by Hallahan (2000), but further research could use the categorizations developed by Grunig (1989) to gain a more detailed and nuanced understanding of the types of public present in Florida, California, and Texas. The survey could also be replicated in other countries affected by citrus greening to address cultural differences between publics. Finally, other critical agriculture and natural resources issues like animal welfare, food safety recalls, and water quality

and quantity could be explored using STOPS to further identify how to communicate about issues more broadly.

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**The Sound of Silence: Exploring why Supporters of Genetic Modification do not Expose
their Attitudes**

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Abstract

More people than ever are using social media sites to get their news and may only be exposed to one side of an issue. News media focuses on negative aspects of genetic modification (GM), and people may believe the majority of America opposes GM science. If this is true, supporters of the technology will be unlikely to express their opinions and consumers will be left to make a decision about the topic with only half the information. This research explored GM supporters' willingness to expose their attitude toward GM science and the role of spiral of silence in discussion about the technology. An online survey was distributed across the US with 1,051 usable responses. GM supporters were mostly Millennials and younger with at least a four-year college degree. Respondents believed others in the US had slightly positive perceptions of GM science, agreed people were becoming more positive toward GM science, and were willing to expose their own attitude. However, more than half of the supporters had a fear of isolation if they exposed their own attitude. Spiral of silence accounted for over half the variance in willingness to expose attitude, and future trends and fear of isolation were significant predictors. Agricultural communicators should facilitate two-way communication on social networking platforms to lessen the effects of spiral of silence and allow consumers to make informed decisions. This study should be replicated with opponents to GM science and in other countries to examine effects of the spiral of silence on other audiences.

Keywords: spiral of silence, genetic modification, attitude, social media, science

Introduction

As the world becomes more technologically advanced, people are able to receive news from a variety of different platforms (Chan-Olmsted, Rim, & Zebra, 2012). Prior to the emergence of the Internet, consumers had to rely on television for news. There were few opportunities for people to select their own news due to a limited number of television channels in the 1960s, 70s, and 80s (Prior, 2007). The prominence of the Internet has allowed consumers to obtain information not only from news sources, but also from bloggers and their peers on social media (Barthel, Shearer, Gottfried, & Mitchell, 2015; Brandtzaeg, Heaum, & Karahasanovic, 2011). Nearly two-thirds of adults in the United States (US) utilize social media sites (Perrin, 2015), and the Millennial Generation reports using social media to learn about the news more than any generation before them (Mitchell, Gottfried, & Matsa, 2015). The growing opportunities for consumers to choose where their news is coming from allows them to select information that matches their own values (Prior, 2007). It is simple for people to seek the news they are interested in and ignore the rest, leaving scholars to believe that gaps in political knowledge have widened as a result (Prior, 2007).

People who are highly active and engaged in social media attempt to influence or persuade others through their platform (Weeks, Ardevol-Abreu, de Zuniga, 2015). Additionally, the news presented on social networks have been found to influence consumers' opinions, knowledge, and behaviors (Bode, 2015; Bond et al., 2012, Messing & Westwood, 2014; Trucotte, York, Irving, Scholl, & Pingree, 2015). When it comes to food, the media has been found to be effective in shaping consumer demand for different products (Verbeke & Ward, 2001; Yadavalli & Jones, 2014). However, when reporting on food safety concerns, the effect of media coverage can sometimes be short-lived (Marsh, Schroeder, & Mintert, 2004; Piggot &

Marsh, 2004). Researchers have found people will change their purchasing behaviors and pay a premium to avoid food they believe is unsafe (Dillaway, Messer, Bernard, & Kaiser, 2011), but once the threat is gone, they will resume normal purchasing behavior.

Information about agriculture is typically communicated via mass media and labels on food products (Verbeke, 2005). Communication about genetically modified (GM) science in the media is particularly negative (Knight, Mather, & Holdsworth, 2014) even though scientists and research has not found the technology to pose any significant threats (National Academy of Sciences, 2016; Nicolai, Manzo, Veronesi, & Rosellini, 2014). In fact, GM science, or the intentional alteration of genes (Food and Drug Administration [FDA], 2014), can offer numerous benefits to farmers and consumers alike. These benefits include increased nutritional value (Paine et al., 2005) and pest resistance that enhances yields (Gonsalves, Ferriera, Manshardt, Fitch, & Slightom, 2000). However, over half of consumers believe GM foods are unsafe for consumption (Funk et al., 2015) and want tighter government regulation regarding mandatory labeling (Langer, 2013; Mahgoub, 2016; Pounds, 2014). The mistrust for GM science likely stems from a lack of industry transparency and negative opinions portrayed in the media (Mahgoub, 2016)

The majority of consumers rely on learning about GM science from the media (Mahgoub, 2016). Information about GM science is not always shared through traditional media outlets, and bloggers (who do not have to be experts or submit to a review process) can share information with a large number of followers through social media very quickly. For example, Food Babe, Vani Hari, has the ability to reach an audience of over one million followers with the click of a button without any external review of the information she shares on her blog. She has been accused of reporting pseudoscience related to GM science and described as “a master of

exploiting base, dumb fears” (Tayag, 2015, para. 1). Regardless of the validity of Hari’s science coverage, her website, which promotes clean eating and transparency in the food industry, received 5.3 million user hits a month in 2014 (Purvis, 2014).

In general, consumers have been found to lack knowledge about GM science and must trust the information communicated to them, no matter the source, is accurate and credible (Earle & Cvetkivich, 1995). Although the media focuses on risks related to GM science (Knight et al., 2014; Mahgoub, 2016)), researchers have found the public may be unsure about those risks and hold neutral attitudes toward GM products (Rumble et al., 2016; Ruth, Gay, Rumble, & Rodriguez, 2015; Ruth & Rumble, 2016). Communicators, processors, and producers need to develop ways to deliver credible information to consumers about GM science that will allow them to make informed purchasing decisions (Mahgoub, 2016). If supporters of GM science are unwilling to expose their attitude to the public, people may mistakenly assume the majority of the public, as portrayed by the media (Knight et al., 2014; Mahgoub, 2016), opposes the technology. When consumers with opposing attitude do not feel comfortable to share their attitudes publicly, it is described as the spiral of silence (Noelle – Neumann, 1974). While the spiral of silence could have effects on both supporters and opponents of GM science, the researchers predicted the spiral of would make GM supporters feel they were in the minority due to the negative media coverage of GM science (Knight et al., 2014; Mahgoub, 2016). Therefore, the purpose of this study was to determine the effects of the spiral of silence on GM supporters.

Theoretical Framework

Noelle-Neumann (1974) proposed the theory of the spiral of silence as a way to understand public opinion. Because people do not simply form attitudes within a vacuum (Perloff, 2014), the theory illustrates the process of how attitudes are developed in a social

environment (Noelle-Neumann, 1974). Fear of isolation can cause people to keep opinions to themselves if it is counter to their perceptions of the group's opinions (Noelle-Neumann, 1974). The threat of isolation can cause people to stay silent or agree with the majority despite their personal moral judgements (Asch, 1951; Milgram, 1961).

People will agree with one of two sides on an issue: the opposition or supporters. Public opinion is naturally reflective of the dominant opinion surrounding an issue. As dominant opinions gain momentum, compliance with the opinion will increase as will the opposition's fear of isolation from others (Noelle - Neumann, 1974). If an individual agrees with the dominant group's opinion, he or she will be more vocal because there is little threat of isolation. However, if the person senses the dominant side is losing traction and the voice of the minority is growing stronger, he or she will start to question the idea and be less likely to engage in conversation. Therefore, the spiral of silence not only relies on the perceptions of current opinions but also on perceptions of future opinions (Noelle - Neumann, 1974).

Media can often exacerbate the social pressure of an issue. Noelle - Neumann (1974) suggested the spiral of silence can be fueled by the urgency of an issue presented by the media. Willingness to express an opinion has also been found to vary based on demographic characteristics. Those more willing to speak out on an issue are typically men, from younger generations, and middle/upper class consumers (Noelle - Neumann, 1974). Noelle - Neumann and Peterson (2004) concluded that groups not as influenced by the spiral of silence are more willing to speak out because they do not feel pressured by threats of isolation.

Recent literature researching spiral of silence across various issues has found that fear of isolation was negatively associated with people's willingness to express opinions on an issue (Ho, Chen, & Sim, 2013; Lee, Oshita, Oh, & Hove, 2014; Matthes et al., 2012). Additionally,

exposure to biased media channels have been found to influence perceptions of others' opinions toward topics (Tsfati, Srtoud, & Chotiner, 2013). On social networking sites, exposure to information counter to an individual's beliefs has been found to decrease willingness to expose opinions (Gearhart & Zhang, 2015). However, the spiral of silence is not present across all issues. Porten-Chee and Eilders (2015) found the spiral of silence had no effect on online discussions about climate change. In fact, the minority was more likely to express their issues on the topic compared to the majority.

Despite the fact that the US is historically more accepting of biotechnology than European countries, the spiral of silence does exist in discussions of the topic. Priest (2006) found people with a lower understanding of science, or a lower level of education in general, were less likely to expose their attitudes when compared to higher educated and knowledgeable people. A study conducted in South Korea specifically explored the role of spiral of silence in conversations about GM science, proposing the use of the Internet may alleviate fear of isolation due to anonymity. Fear of isolation was found to be predictive of willingness to expose attitude (Kim, 2012), and despite their hypothesis, the spiral of silence existed in the way people use the Internet. In this case, people were more likely to express their opinion if they aligned with the opinions expressed in an online forum. The researchers concluded the Internet had the ability to shape the public's opinion about GM science (Kim, Kim. & Oh, 2014). A separate study by Metzger (2009) concluded the spiral of silence was particularly strong on Facebook because it consists of real world connections. Few studies have been conducted in the US studying the effects of the spiral of silence in GM science discussions, therefore this study was developed to address this gap in the literature and explore the reasons why those in support of GM science (GM supporters) do or do not expose their attitudes on the subject.

Purpose and Objectives

The purpose of this study was to explore US GM supporters' willingness to expose their attitudes toward GM science and the role of spiral of science in discussions on the topic. The following objectives guided the study:

1. Describe GM supporters' demographics, attitude toward GM science, perceived opinion of others' attitude toward GM science, perceived future trends of attitudes toward GM science, willingness to expose attitude toward GM science, and fear of isolation compared to overall US consumers.
2. Identify the relationships between GM supporters' attitude toward GM science, perceived opinion of others' attitude toward GM science, perceived future trends of attitudes toward GM science, fear of isolation, and willingness to expose attitude toward GM science.
3. Determine if fear of isolation, attitude toward GM science, perceived opinion of others' attitude toward GM science, and perceived future trends of attitudes toward GM science predict GM supporters' willingness to expose their attitude toward GM science.

Methodology

An online survey was used to collect data for this study. Because the spiral of silence examines how likely people are to expose attitudes that surround an issue (Noelle-Neumann, 1974), the population of interest had to be more narrowly defined than all US consumers. Due to the negative media coverage of GM science (Knight et al., 2014), the researchers elected to define the population of interest as GM supporters in the US. Opponents to GM science were not included in this research to allow deeper analysis on the effect of spiral of silence on GM supporters.

The survey was distributed using non-probability opt-in sampling procedures by a public opinion research company, Qualtrics, to US residents in all 50 states. Quota sampling procedures were put in place to ensure responses were received from each of the 50 states and were at least 18 years of age. In addition, two attention filters were built in to the survey to ensure accurate, thoughtful responses were received. These questions would ask the respondent to select a specific answer (e.g. select agree), and the survey was terminated if the answer was not selected. The survey was distributed to 1,751 potential respondents, with 1,051 meeting the necessary requirements and passing through the attention filters to complete the survey resulting in a 60% participation rate. To aid in the generalizability of the study, the sample was weighted for sex, race, and age to match the 2010 National Census profile. Post-stratification weighting of demographics can alleviate non-probability sampling limitations including exclusion, selection, and non-participation bias resulting in representation equal to, and sometimes better than, probability-based samples (Baker et al., 2015).

This research was part of a larger study that focused on consumer perceptions of science and the citrus industry, and 30 questions were analyzed in addition to demographic characteristics. The construct of attitude toward GM science was adapted from Noelle – Neumann (1974) and was measured using an eight-item, five-point bipolar semantic differential scale (e. g. good/bad, acceptable/unacceptable, crucial/trivial). Positive adjectives were labeled as a five and negative adjectives were labeled as a one. A construct was created by taking the average of the responses. Perceived opinions of others was measured using a similar scale. Instead of asking about their own opinions, the construct asked what the respondents' believed the majority of the US thought about GM science. This construct was created by calculating the average of the eight items and could range from one (negative) to five (positive). Attitude toward

GM science and perceived opinion of others' attitude toward GM science used the following real limits to interpret attitude: $1.00 - 1.49 = \textit{negative}$, $1.50 - 2.49 = \textit{slightly negative}$, $2.50 - 3.49 = \textit{neutral}$, $3.50 - 4.49 = \textit{slightly positive}$, $4.50 - 5.00 = \textit{positive}$.

Respondents were asked about their perceptions of future trends regarding GM science on a seven-item, five-point Likert-type scale, which was adapted from Noelle – Neumann's (1974) seminal piece. The labels ranged from *strongly disagree* = 1, *disagree* = 2, *neither agree nor disagree* = 3, *agree* = 4, and *strongly agree* = 5. The items included statements like “In the future, people will be less accepting of GM science;” “In the future, people will be supportive of GM science;” and “In the future, people will be more fearful of GM science.” Statements were recoded so that negative responses were assigned a one and positive responses were assigned a five. The future trends construct was calculated by taking the average of the seven items.

Fear of isolation was also measured using a five-point Likert-type scale with the same labels as future trends. The statement read, “I would worry about being isolated if the people I am talking to disagreed with my opinions regarding GM science.” For analysis, the variable was recoded into a dichotomous variable. A respondent was assigned a one if they agreed or strongly agreed they were fearful of isolation if they expressed their opinion and a zero if they neither agreed nor disagreed, disagreed, or strongly disagreed they would be fearful of isolation.

The final variable, willingness to expose attitude toward GM science, was measured with a six-item, five-point Likert-type scale (Noelle – Neumann, 1974). The labels were the same as the future trends construct and ranged from *strongly disagree* (not willing to expose) = 1 to *strongly agree* (willing to expose) = 5. Statements included: “I would readily participate in a group discussion about GM science;” “I would be afraid to speak up in a group discussion about GM science;” and “I would let the other people I am talking to win an argument about GM

science even when I believe I am right.” The construct was created by taking the average of the items. The real limits used to interpret the future trends and willingness to expose construct were $1.00 - 1.49 = \text{strongly disagree}$, $1.50 - 2.49 = \text{disagree}$, $2.50 - 3.49 = \text{neither agree nor disagree}$, $3.50 - 4.49 = \text{agree}$, $4.50 - 5.00 = \text{strongly agree}$.

Demographic questions identified age, which was recoded into generational categories of Millennials and younger (1977-1996), Generation X (1965-1976), Young Baby Boomers (1955-1964), Old Baby Boomers (1946-1954), and the Silent Generation and older (1945 and earlier; Zickuhr, 2010), annual income, highest level of education, race (check all that apply), sex, and if they lived with children.

Researchers received IRB approval from the University of Florida and a panel of experts reviewed the survey instrument before distribution to ensure content and face validity (Ary, Jacobs, & Sorensen, 2010). The Associate Director for the Center for Public Issues Education at the University of Florida, an assistant professor with a specialization in food production, and an associate professor with in-depth knowledge of survey design served as the panel of experts. A pilot-test with 50 respondents representative of the population of interest was used to ensure the online instrument worked appropriately. Additionally, all constructs were reliable at a Cronbach's alpha of at least .70 and were normally distributed (Field, 2013). The survey was open from September 24, 2015 to September 26, 2015 to avoid a history effect on the respondents' answers (Ary et al., 2010).

Because they were the focus of this study, *GM supporters* were identified as those whose attitude toward GM science was at least one standard deviation above the overall mean of attitude toward GM science. Only those with this score were used in further data analysis. For objective one, descriptive statistics were used to describe the demographics and variables of

interests of the general public and of GM supporters. Pearson correlations and Point-Biserial Correlation were used to fulfill objective two. Davis's (1971) interpretation of effect size was used to interpret the results: .01 - .09 = *negligible association*, .10 - .29 = *low association*, .30 - .49 = *moderate association*, .50 - .69 = *substantial association*, and .70 or higher = *very strong association*. Objective three used multiple linear regression to determine if fear of isolation, attitude toward GM science, perceived opinions of others, and future opinions of others were predictive of GM supporters' willingness to expose attitudes on the topic. Fear of isolation was treated as a dummy variable.

Results

Description of GM Supporters

The majority of GM supporters were Millennials and younger and male. Approximately one-fifth of the supporters were Hispanic and more than half had children. Additionally, the majority of GM supporters had at least a 4-year college degree. A full description of GM supporters and the general public can be seen in Table 1.

Table 1

Description of the General Public and GM Supporters

Characteristic	<i>General Public</i> (<i>N</i> = 1,051) <i>f</i>	<i>GM Supporters</i> (<i>n</i> = 188) <i>f</i>
Generation		
Millennials and Younger	37.8	53.4
Generation X	20.8	20.8
Young Baby Boomers	18.2	12.2

Old Baby Boomers	11.4	6.6
Silent Generation and Older	11.9	7.0
Sex		
Female	51.2	45.4
Male	48.8	54.6
Income		
\$24, 999 or less	17.2	28.7
\$25,000-\$49,999	25.0	14.7
\$50,000- \$74,999	20.1	11.3
\$75,000 or more	37.6	45.2
Hispanic	14.3	22.7
Race		
White	79.1	84.4
African American	13.4	14.4
Other	9.3	2.6
Education		
High school graduate or less	15.6	16.0
Some college, no degree	26.8	24.2
2- year college degree	11.5	5.1
4- year college degree	30.4	36.6
Graduate or Professional Degree	15.7	18.2
Children in the home	36.3	52.0

GM supporters held a positive attitude toward GM science and perceived others to have slightly positive attitudes toward GM science. When asked about future trends regarding attitudes toward GM science, the supporters agreed that attitudes toward the technology would become more favorable in the future. Additionally, GM supporters agreed they were willing to expose their attitudes about GM science. Less than half of the GM supporters (43.7%, $n = 82$) possessed a fear of isolation in discussions of GM science. Table 2 describes GM supporters and the general public's perceptions of GM science.

Table 2

Description of Respondents' Attitude, Perceived Opinion of Others, Perceived Future Trends, And Willingness to Expose Attitude in Relation to GM Science

	General Public	GM Supporters
Construct	<i>M (SD)</i>	<i>M (SD)</i>
Attitude	3.45 (1.02)	4.83 (0.21)
Perceived Opinion of Others	2.98 (1.07)	3.95 (1.05)
Future Trends	3.27 (0.82)	3.89 (0.61)
Willingness to Expose Attitude	3.46 (0.74)	3.77 (0.82)

Exploring Relationships

Pearson correlations and Point-Biserial Correlations were used to determine relationships between variables of interest for GM supporters (Table 3). There was a negative, moderate association between fear of isolation and attitude toward GM science. Additionally, a positive, substantial association was found between willingness to expose attitude future trends. A

negative, substantial association was also found between willingness to expose attitude and fear of isolation. All other relationships had low associations with one another.

Table 3

Correlations between GM Supporters' Attitude toward GM Science, Perceived Opinion of Others' Attitude Toward GM Science, Perceived Future Trends of Attitudes Toward GM Science, Fear of Isolation, and Willingness to Expose Attitude toward GM Science

	Attitude	Perceived Opinion of Others	Future Trends	Fear of Isolation	Willingness to Expose Attitude
Attitude	1				
Perceived Opinion of Others	.110	1			
Future Trends	.290	-.115	1		
Fear of Isolation ^a	-.339	.149	-.288	1	
Willingness to Expose Attitude	.216	-.218	.545	-.574	1

^a Point-Biserial Correlations

GM Supporters' Willingness to Expose Attitudes toward GM Science

Multiple linear regression was used to determine if the variables of interest were predictive of GM supporters' willingness to expose their attitudes (Table 4). The model was statistically significant ($F(4, 183) = 50.17, p < .01$) and accounted for 52.0% of the variance in willingness to expose attitude toward GM science.

Future trends of opinions toward GM science and fear of isolation were both statistically significant predictors of willingness to expose attitudes. As perceptions of future trends increased by one point, willingness to expose attitude increase by .60. In addition, if a respondents had a fear of isolation their willingness to expose their attitude decreased by .80. Attitude toward GM science and perceived opinion of others' attitude toward GM science were not predictors of willingness to expose attitude.

Table 4

Influence of Spiral of Silence Characteristics on Willingness to Expose Attitude toward GM Science

	<i>b</i>	<i>p</i>
Constant	3.33	
Attitude	-0.26	.25
Perceived Opinions	-0.07	.10
Future Trends	0.60	.01**
Fear of Isolation	-0.80	.01**

Note. ** $p < .01, R^2 = .52$

Conclusions, Implications, & Recommendations

This study explored the role of spiral of silence in GM supporters' discussions about GM science. The majority of GM supporters were Millennials and younger, who are likely in the

generation of consumers who use social media to receive information more than any others (Mitchell et al., 2015). While the spiral of silence is not always present in issues online (Porten-Chee & Eilders, 2015), people are generally unwilling to express their opinion on social networking sites (Gearhart & Zhang, 2015). The fact that the majority of GM supporters may be using social media to receive news means they could fall under the influence of spiral of silence and be less willing to speak their opinions. Agricultural communicators should work on being more proactive on popular networking sites such as Facebook or blogs being used to discuss GM science. If GM supporters are exposed to stories and comments about GM science on social networking sites that align with their own opinions, they will likely feel like attitudes toward the technology are becoming more positive and become more willing to discuss their own attitudes. In terms of future research, testing the influence of comments in an online forum on a person's willingness to expose attitudes could provide researchers a better idea of the role spiral of silence plays online in discussions about GM science. Equal representation of both supporters and opponents of GM science on networking sites will allow consumers to make informed decisions about the technology.

Additionally, the majority of GM supporters had at least a 4-year college education, which would make them more willing to expose their attitudes compared to those with less education, according to Priest (2006). Because a number of Millennials and younger consumers may still be enrolled in classes at a university, Agricultural Education departments should develop course materials teaching students how to advocate for their positions in agriculture and practice discussions about contentious topics like GM science. These courses could also emphasize the importance of listening and understanding the viewpoint of the opposition to engage in constructive dialogue with the opposition. As students learn how to effectively

communicate their ideas in a safe space, such as a classroom, they will likely feel less pressure from fear of isolation. This recommendation should hold true for opponents to GM science as well.

The GM supporters agreed that future trends toward GM science would become more positive and that they were willing to share their opinions. GM supporters also viewed others as having slightly positive attitudes toward GM science. These generally positive views toward the variables of spiral of silence could mean that the group would be less affected by negative conversations about the technology in the media (Noelle – Neumann, 1974). However, nearly half of the GM supporters possessed a fear of isolation if they were to share their views on GM science. This trait could ultimately keep GM supporters from being open with their opinions on the subject (Noelle – Neumann, 1974) and needs to be further explored. Additionally, if GM supporters do not feel comfortable sharing their opinions, the public will only be exposed to the louder voice of the opposition (Knight et al., 2014) and unable to make informed decisions about GM science.

Moderate to substantial relationships were identified between fear of isolation and attitude, willingness to expose attitude and future trends, and willingness to expose attitudes and fear of isolation. These relationships were further explored through regression, which found that spiral of silence was having an effect on GM supporters. However, the GM supporters' attitude was not a predictor of their willingness to expose attitudes. The agricultural and biotechnology industry cannot simply expect supporters of a technology to be vocal about an issue just because they support it.

The GM supporters' willingness to speak out was reliant on perception of future trends and fear of isolation, which aligned with previous studies (Ho et al., 2013; Lee et al., 2014;

Matthes et al., 2012). Consistent with the spiral of silence (Noelle – Neumann, 1974), as GM supporters' perceptions of others' future attitudes became more positive, they were more willing to speak out. This implies that if the media (social media or otherwise) emphasizes negative future attitudes of others, it could have an effect on whether or not GM supporters speak up about their beliefs. However, nearly half of the GM supporters had a fear of isolation, and these findings indicated that those with a fear of isolation were less likely to speak out on the issue. This implies agricultural communicators need to minimize GM supporters fear of isolation. If this effect is not mitigated, the findings show the majority of GM supporters will not be willing to speak out for fear of isolation and the spiral of silence will continue as they perceive the majority opinion to increase (Noelle – Neumann, 1974). Including demographic information in future analysis of the spiral of silence could provide deeper insight into who these supporters are and how communicators can develop targeted communication for them. Demographics of interest could include geographic region of residence, whether supporters have an agriculture background, family values, and political ideology.

Agricultural communicators should consider collaborating with extension agents to develop educational materials and host community events featuring farmers, producers, and consumers to lead discussions about GM science. Hosting discussions focused on the facts of GM science would provide a safe space for GM supporters to share their opinions, which could decrease their fear of isolation and increase their willingness to expose their attitude (Noelle – Neumann, 1974). These public discussions would also provide general consumers an opportunity to hear information about GM science that may not be covered in popular media. Additionally, these forums could be used to allow opponents of GM science to voice their concerns about the technology. An open two-way communication between opponents and supporter would allow

both sides to holistically understand the issue and possibly find common ground between their beliefs.

The media's portrayal of GM science has been mostly negative (Knight et al., 2014; Mahgoub, 2016). Increasing industry communication through social networking sites, like blogs, Facebook, and online videos, could provide the public opportunities to learn about why some people support GM science while others oppose it. Increase use of social networking platforms to encourage two-way discussion about GM science could also help to narrow the knowledge gap related to the issue (Prior, 2007). If GM supporters view the media's portrayal as becoming more positive, they will be more willing to share their opinion with others (Noelle – Neumann, 1974), and the public can make educated decisions regarding their own support of GM science after hearing both sides of the issue.

This research is not without its limitations. Non-probability sampling procedures were used, which could limit the generalizability of these findings; using random sampling procedures of the US would alleviate this issue. Additionally, the respondents only reported their willingness to speak out and were not asked to actually speak about their attitudes in a group setting. Actual willingness to speak out could differ from intent and should be observed through focus groups or by using an experimental design. Including questions about respondents' use of social media would also help strengthen the findings and implications from the study. The spiral of silence was only explored amongst GM supporters, and future research should replicate this study with the GM opponents as well. This study was also limited to US residents. Given that Americans are more accepting of GM science than most of the world (Priest, 2006), it is strongly recommended this study be replicated in other countries which could provide valuable information about how different cultures view this issue as well.

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Moment-to-Moment Analysis of Viewer Comfort in Response to Animal Slaughter Videos

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Moment-to-Moment Analysis of Viewer Comfort in Response to Animal Slaughter Videos

Abstract

The Glass Walls project is a series of videos created by the American Meat Institute that provides an honest look into the animal agricultural industry, specifically as it pertains to animal slaughter and carcass fabrication. This study sampled portions of the videos and presented them to a sample of college students, who varied in their level of agricultural involvement, and were asked to provide continuous ratings of comfort while viewing the two videos. Findings indicated that those participants with a high level of agricultural involvement reported being more comfortable with the material being presented. Additionally, critical moments were identified that elicited a strong response. Both participants with a high and low level of agricultural involvement reported being uncomfortable during the same critical moments. The results from this research suggests that transparency can be met with discomfort from the consumer. Therefore, practitioners and researchers should seek to develop ways to present the same material, but in a way that creates less discomfort for the audience.

Keywords: *Continuous Response Measurement, Elaboration Likelihood Model, Animal Slaughter, Transparency, Animal Agriculture*

Introduction

With less than 2% of the American population involved in production agriculture, a disconnect continues to grow between producers and consumers regarding knowledge about agriculture production practices (Vilsack, 2014). The decrease in agricultural involvement is paired with an increase in consumer demand for transparency; however, consumers are often unsure where to find accurate information concerning production practices such as animal welfare and slaughter (Croney & Reynnells, 2008). Furthermore, professionals within agricultural industries struggle to understand how to be transparent with consumers (Abrams, Zimbres, & Carr, 2013; Croney & Reynnells, 2008).

Due to the influence of public opinion on policy regarding agricultural production practices, the agricultural industry must consider the opinions of consumers, and communicators need to determine ways to effectively communicate with the public (Gellynck, Verbeke, & Vermeire, 2006). The public should be provided with accurate information to make informed decisions despite the individual attitudes they might hold (Croney & Reynnells, 2008; Vermeir & Verbeke, 2006). Consumers of animal products want to be assured that animals used for food are treated humanely both before and during the slaughter process (Croney & Reynnells, 2008). Increased public demand for transparency in animal production, especially the slaughter process, helps ensure and improve animal welfare of food animals (Troy & Kerry, 2010). However, industry professionals may resist complete transparency due to the intense emotional content associated with animal slaughter (Rumble & Irani, 2016). The unpleasant details of the slaughter process make it difficult for industry professionals to provide transparent information while maintaining consumer comfort and confidence of the meat industry (Croney & Reynnells, 2008; Rumble & Irani, 2016).

Although consumers are averse to the unpleasant details of animal production, topics such as food safety outbreaks, meat recalls, and the humane treatment of animals often appear within the news media's agenda (e.g., Kristoff, 2016). Exposure to negative images and stories associated with the food animal production process can lead many consumers to believe that this is the normal for the industry (Kovar & Ball, 2013). Thus, agriculturalists must take an active role in agricultural literacy, especially regarding the meat industry.

The call for greater transparency has resulted in the American Meat Institute's distribution of informational videos describing the animal slaughter process through the Glass Walls project (Riley, 2012). This project released videos of the slaughter process via YouTube, for beef, pork, and poultry. Later, a video of the lamb slaughter process was released. Each video is narrated by Dr. Temple Grandin, an animal behaviorist at Colorado State University. As the spokesperson for the Glass Walls project, Grandin provides narration describing the purpose for each step in the video to educate the viewer on the animal slaughter process (Riley, 2012). As of September 2016, the beef slaughter video had more than 340,000 views while the hog slaughter video had more than 630,000 views.

Due to the unique and graphic content in educational animal slaughter videos, it is important for researchers to examine how these transparent elements impact viewer comfort with graphic visuals to understand how consumers respond to agricultural literacy efforts. By better understanding consumer response, the meat industry may be able to create more effective consumer education programs that better inform audiences about their products and increase consumer acceptance of these processes without triggering message avoidance.

Theoretical Framework

The free and widespread distribution of messages aimed at increasing transparency surrounding animal slaughtering represents an attempt to affect changes in the public's attitudes regarding animal slaughtering. Given the implicitly persuasive goal of such efforts, theories of persuasion via mass communication present a useful theoretical lens to examine how shifts in attitude occur. One such theory, the Elaboration Likelihood Model (ELM, Petty & Cacioppo, 1986), was used to guide this study. Stone, Singletary, and Richmond (1991) have defined attitudes as an "enduring system of positive or negative evaluations, emotional feelings, and pro and con tendencies with respect to a social object" (p. 191). When an individual is exposed to message, the receiver will create judgments or evaluations on the information to form an attitude (Stone et al., 1999).

The ELM describes the framework in which an individual will process a message, elaborate, and form an attitude about a communications message (Petty & Cacioppo, 1986). The model proposes that there are two cognitive routes of processing: the central processing route and the peripheral processing route. The central processing route focuses on the message argument and deals with the quality of information contained within the message. The peripheral processing route may be engaged when the individual pays less consideration to the message quality and relies on peripheral cues or factors within the message requiring no cognitive effort to process.

If processing occurs via the peripheral route, heuristic features within the message such as perceived source credibility or the perceived attractiveness of the message will cause a person to accept or reject what is being presented without considering the actual merits of the message (Frewer, Howard, Hedderly, & Shepard, 1997). However, if the receiver of the message is both motivated and has sufficient knowledge to carefully consider the message, the theory holds that

processing will take place via the central route and systematic thinking about the message will occur (Petty & Cacioppo, 1986).

With respect to agricultural messages, the role of issue involvement becomes particularly salient. High issue involvement is generally processed through the central route, while issues where the participant has low or no involvement typically occurs through the peripheral route (Petty & Cacioppo, 1986). Fishbein and Ajzen (1975) found participants with higher involvement generally have more positive attitudes. Furthermore, research has suggested that higher levels of perceived transparency has a higher effect on attitude formation toward agricultural issues (Rumble & Irani, 2016). In the context of animal harvest videos, this logic suggests that those with greater involvement with agriculture should display more positive attitudes in general toward messages designed to increase transparency. These more positive attitudes toward a topic should yield greater comfort with potentially graphic imagery depicted in the spirit of transparency.

Purpose and Research Questions

The purpose of this study was to determine the comfort level of young adults who vary in their level of personal involvement with agriculture when viewing videos of the cattle and hog slaughter process aimed at increasing transparency surrounding animal slaughtering. Furthermore, this study sought to determine key components of these messages that elicited the greatest discomfort with the message. Thus, the study sought to test the following hypothesis and research question:

H: Participants with higher levels of agricultural involvement will have higher overall comfort in response to educational videos of the animal slaughter process.

RQ: What elements in the animal slaughter video elicit the most discomfort among the participants?

Method

A purposive sample of young adults from [university] who varied in their level of agricultural involvement were recruited to participate in a study where they provided continuous ratings of comfort while viewing two videos from the Glass Walls project describing the animal harvest process. One video displayed the cattle slaughter process, while the other video provided information on the hog slaughter process. The formal design of each test was a 2 (agricultural involvement: high vs. low) x 53 (time segments) mixed-measures design.

Independent Variables

Agricultural involvement. Participants' level of agricultural involvement served as a between-subjects variable and was determined using a pretest where participants were asked to rate their level of agreement with 10 statements. The scale was adapted from two scales on sport and team identification (Wann, 2002; Wann & Branscombe, 1993). Items such as "I spend a considerable amount of money on my agriculture related interests" were paired with 10-point Likert response scales (0 = *strongly disagree*, 9 = *strongly agree*). Agricultural involvement measured how much the participants are connected to agriculture and how much the respondents viewed agriculture as a part of their personal identity. Responses were highly consistent (Cronbach's $\alpha = .97$), and participant responses were summed and averaged to develop an agricultural involvement score. A median split procedure ($Mdn = 4.8$) then determined participant assignment to high ($n = 86$) or low ($n = 79$) agricultural involvement conditions.

Time segment. To capture the changing nature of viewer comfort throughout the video, time segment served as a within-subjects variable to examine changes over its duration. Each video was segmented into 53, two-second, segments where participants indicated their comfort level of the stimuli.

Dependent Variable

The **perceived comfort level** participants reported while watching the videos served as the repeated dependent variable for this study gauged through continuous response measurement or “dial testing.” Because “cognitive states of individuals change continuously as they attend to, understand, and react to messages” (Bioca, David, & West, 1994, p. 15), gross post-test assessment of attitudes fails to capture the shifts in attitude throughout a message. Dial testing allows participants to report his or her reactions continuously throughout a message. In this study, perceived comfort level was derived from the participants’ moment-to-moment responses recorded using the Perception Analyzer 8.0 audience response system. While watching the stimuli, participants used wireless handheld dials to continuously report their moment-to-moment level of agreement with the statement, “I am comfortable with the material I am viewing.” Response options ranged from 0 (extremely uncomfortable) to 100 (extremely comfortable). The sampling interval was set at 1 second. Data were transformed offline to compute change scores from a starting point of 50. Thus, positive scores indicate greater comfort while negative scores indicate greater discomfort. Furthermore, data were resampled to generate 53 two-second averages.

Stimuli

Two video clips, one on cattle slaughtering and one on hog slaughtering, were sampled from the American Meat Institute’s (2012) Glass Walls project. The stimuli contained footage of the moment the animal entered the facility to when the animal was pronounced dead. The videos were selected as they provide a visually transparent tour of the animal slaughtering process while simultaneously providing a narrative explanation of why procedures are conducted in a specific manner. Cattle and hog were chosen due to their popularity on YouTube. The cattle video had a

duration of 2 minutes and 9 seconds. The hog video had a duration of 1 minute and 58 seconds. The videos were played over the testing room's two overhead ceiling mounted speakers at uniform volume on a forward-mounted projection screen. To guard against order effects, presentation order of the videos was counterbalanced across viewing sessions (Gravetter & Forzano, 2015).

Participants

A purposive sample of 186 young adult participants was recruited from two colleges—one communications college and one agricultural college—within a large university. Data for 17 participants was removed due to non-response during the continuous rating task. Of the 169 completed responses, 55% of the participants identified as male, 12.4% indicated they were freshman, 33.7% sophomores, 36.7 juniors, and 17.2 % indicated they were seniors. Additionally, 56.8% of the participants were from outside the agricultural college.

Results

Overall Comfort with Slaughter Videos

The first hypothesis predicted that those with higher agricultural involvement would report greater comfort while viewing the educational videos than those with less involvement. This hypothesis, as well as subsequent research questions, was tested by a pair of analogous mixed-measures ANOVAs where participants' level of involvement served as a between-subjects fixed factor. To examine shifts in comfort throughout the message, time segment served as a within-subjects factor. In the first test, the moment-to-moment comfort scores while viewing the hog harvest video served as the repeated dependent measure, and scores while viewing the cattle harvest video served as the dependent measure in the second test.

In the test examining response to the hog harvest video, Mauchly's test of sphericity indicated that the assumption of sphericity was not met for time, $X^2(1430) = 24923.05, p < .05$. As such the Greenhouse-Geisser conservative correction for degrees of freedom was used since the estimated ϵ was less than 0.75 (Maxwell & Delaney, 2004). The corrected ϵ was 0.05. Regarding H1, involvement for agriculture had a significant effect on participants level of comfort while viewing the hog harvest video, $F(1,163) = 12.795, p < .01$, partial $\eta^2 = .07$. As can be seen in figure 1, those with greater involvement reported overall higher levels of comfort during the video.

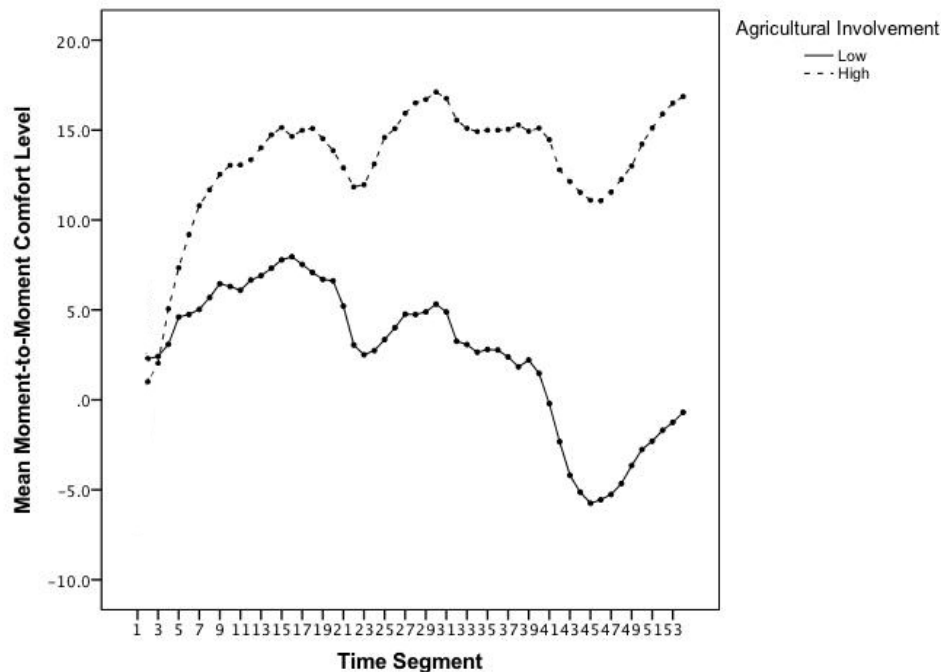


Figure 1. Description of Repeated Measures ANOVA of the Hog Slaughter Video

For the cattle harvest video, Macuhly's test of sphericity again indicated that the assumption of sphericity was not met for time, $X^2(1430) = 27982.765, p < .01$. The Greenhouse-Geisser correction for degrees of freedom was used since the estimated ϵ was less than 0.75 (Maxwell & Delaney, 2004). As with the hog harvest video, involvement in agriculture had a

significant effect on participants' level of comfort, $F(1,163) = 19.787, p < .01$, partial $\eta^2 = .12$.

Results are presented in Figure 2, which indicates that those with greater involvement consistently reported greater comfort than those with less involvement. Thus, H1 was supported.

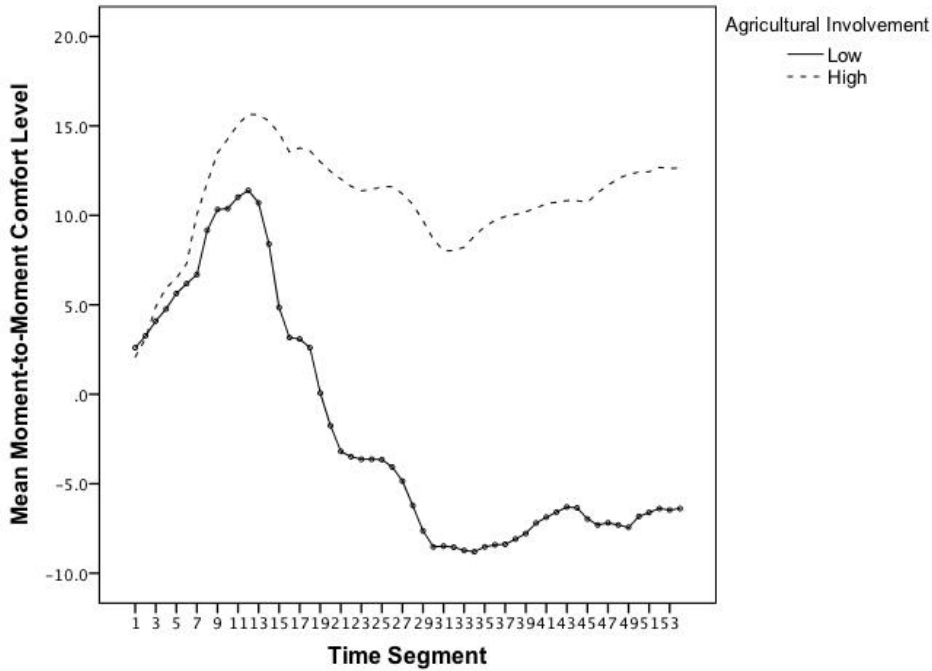


Figure 2. Description of Repeated Measures ANOVA of the Cattle Slaughter Video

Shifts in Comfort in Response to Harvest Videos

Both tests revealed a significant two-way interaction between agricultural involvement and time (hog harvest, $F(2.868, 8639) = 7.784, p < .01$ partial $\eta^2 = .046$; cattle harvest, $F(2.128, 8639) = 11.728, p < .01$, partial $\eta^2 = .07$). Thus, participants' reported comfort level changed both as combined function of their level of involvement in agriculture and the unfolding nature of the videos (i.e., time segment). To further analyze the relationship between involvement and comfort level, the researchers visually inspected the mean comfort scores to identify critical moments during each video where respondents' comfort levels decreased. Furthermore, once these critical moments were identified, paired samples *t*-tests were used to determine if there





were statistically significant differences between the moments immediately prior to and after the critical moments identified through visual inspection.

Descriptions of the critical moments within the hog harvest video are presented in Table 1. Participants reported being more comfortable while the hogs were being moved into the CO₂ (Segments 14-15) four seconds before the critical moment ($M = 10.877$, $SD = 18.715$), as opposed to the 17 seconds (segments 16-27) when the sliding door to the CO₂ chamber closes while Grandin discusses how the hogs are anesthetized and while the anesthetized hogs are dumped onto a conveyer belt ($M = 9.248$, $SD = 20.255$). The critical moment resulted in a statistically significant change in comfort levels when comparing the 4 seconds prior to the moment $t(168) = 2.612$, $p < .01$. Additionally, participants reported being more comfortable while Grandin described the laws regarding stunning before slaughtering animals, (segments 28-29) four seconds after the critical moment ($M = 10.325$, $SD = 23.727$), as compared to the 17-second portion (segments 16-27) of the video depicting hogs being dumped out of the CO₂ chamber ($M = 9.248$, $SD = 20.255$). There was no statistical difference between the critical moment and the four seconds immediately after the moment $t(168) = 9.616$, $p = .147$.

Regarding the second critical moment, participants reported being more comfortable while seeing the hogs suspended from their hind leg (Segments 38-39) 4 seconds before the critical moment ($M = 8.266$, $SD = 25.646$), as opposed to the 20 seconds (segments 40-50) where a plant employee bleeds the hogs while Grandin explains the importance of a good bleed and talks about how the plant employee in the video is doing a good job and ends with an employee conducting an internal audit to ensure the animal will not return to sensibility ($M = 4.144$, $SD = 27.272$). The critical moment resulted in a statistically significant change in comfort levels when comparing the four seconds prior to the moment $t(168) = 6.230$, $p < .01$. Additionally,

participants reported being more comfortable while the plant worker continued to conduct her internal audit, (segments 51-52) four seconds after the critical moment ($M = 5.685$, $SD = 28.259$), as compared to the 20-second portion of the video (segments 40-50) that depicts hogs being bled ($M = 4.144$, $SD = 27.272$). The critical moment resulted in a statistically significant decrease in comfort compared to the four seconds after the moment $t(168) = -2.690$, $p < .05$.

Table 1
Description of Critical Moments within the Hog Slaughter Video

Time Segments	Imagery	Narration
Segments 14-15		"Maybe five or six pigs will fit in the gondola."
Segments 16-27	 	"And the sliding door shuts down and it is lowered down into the CO2. It goes about 30 feet into the ground with 90% CO2, and then comes back up." "And after the pigs are anesthetized they are dumped out."
		"By law, pigs must be stunned before they are slaughtered. Stunning makes them insensible to pain. And when you use a method, such as CO2 stunning..."

Segments
38-39

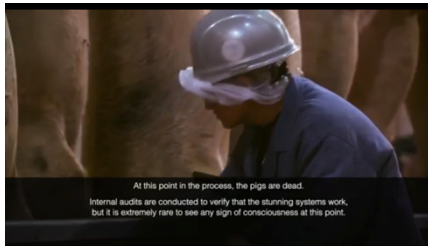


“...they hang up, then there will be a person who bleeds the pig.”

Segments
40-50



“This shot right here shows bleeding the pig, really typical bleeding, doing a really good job. It’s really important to get a good bleed. This plant employee is doing a really good job.”



“Here you see a plant employee who is doing an internal audit to make sure that all these pigs are being rendered insensible.”

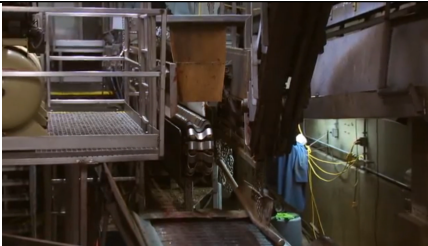

To further analyze the relationship between involvement and comfort level during the cattle harvest video, a similar process was employed to first, visually identify critical moments during the stimuli where respondents’ comfort levels decreased, and second, test for significant differences in shift in reported comfort level. Descriptions of the critical moments during the cattle harvest video are presented in Table 2.

Participants reported being more comfortable while the steer was in the restrainer and straddling the conveyer belt, (segments 10-11) four seconds before the critical moment ($M = 12.375$, $SD = 16.340$), as opposed to the 19 seconds (segments 12-21) when the plant worker stunned the steer ($M = 8.545$, $SD = 18.375$). The critical moment resulted in a statistically significant change in comfort levels when comparing the four seconds prior to the moment $t(168) = 4.456$, $p < .01$. Additionally, participants comfort levels plateaued while the stunned steer had a chain wrapped around its leg, (segments 22-23) four seconds after the critical moment ($M =$

3.475, $SD = 18.375$), as compared to the 19 second portion (segments 12-2) of the video that showed the steer being stunned ($M = 8.545$, $SD = 18.375$). The critical moment resulted in a statistically significant change in comfort level when comparing the four seconds after the moment $t(168) = -6.178$, $p < .01$.

Regarding the second moment, participants reported being more comfortable while watching the steer in the restrainer (segments 23-24) four seconds before the critical moment ($M = 3.396$, $SD = 23.743$), as opposed to the 20 seconds (segments 25-34) when the steer is dumped onto a conveyer belt as well as the during the moments where multiple steer are seen suspended from their hind leg exhibiting uncoordinated kicking ($M = .882$, $SD = 24.725$). The critical moment resulted in a significant change in reported comfort level $t(168) = 5.930$, $p < .0005$. Additionally, participants reported no significant change in comfort levels from segments 25-34 ($M = .882$, $SD = 24.725$) to segments 35-36 which were the four seconds after the moment ($M = .0695$, $SD = 25.856$), $t(168) = 1.733$, $p = .085$.

Table 2
Description of Critical Moments within the Cattle Slaughter Video

Time Segment	Imagery	Narration
Segments 10-11		"This plant has a center track restrainer system where the animal straddles a moving conveyor..."
Segments 12-21		"...and the animals just ride along the conveyor, as they ride along they are shot with a captive bolt gun. And that's the reason why you didn't see the animal drop when it was shot. The neumatic gun used in this plant is a very powerful tool, and the animal's brain is destroyed instantly"



“After the animal is shot, while it’s still held in the center tract conveyer system...”

Segments
22-23



“A chain is looped around its leg, it’s on a trolley that goes along on a track.”

Segments
24-34

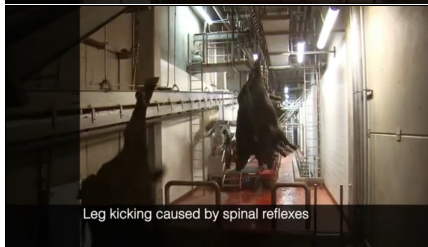


“And he falls out of the restrainer and goes down onto a take away conveyer. And the trolley goes down into the bottom on an incline conveyer and it is lifted up.”



You will usually see some uncoordinated kicking, especially of the free back leg. That’s spinal reflexes. Because the circuits for walking are in the spine.”

Segments
35-36



“And when you destroy the brain that walking circuit just gets hyperactive.”

Conclusions, Discussion, and Recommendations

Transparency regarding animal welfare and the animal slaughter can be a slippery slope for agricultural industry professionals (Croney & Reynnells, 2008). As consumers continue to demand transparency in agricultural production practices (Rumble & Irani, 2016) time should be spent determining the effects it has on the consumer and their perceptions of agriculture. The

Glass Walls project provides messages aimed at increasing transparency surrounding the animal slaughter process. Because the goal of this project was to elicit positive attitudes toward animal production practices, the videos should have elicited a positive response, or comfortable response from the receivers of the information. However, the results of these findings demonstrate that increased transparency may be met with great discomfort by the viewing audience. By better understanding what consumers are comfortable viewing, and what specific message features elicit positive attitudes, individuals working within agriculture can better package content for consumers. This can be done by selectively determining what levels of transparency satisfy public concerns over treatment of animals during slaughter without eliciting extreme levels of discomfort.

Results suggested higher levels of issue involvement played a role in the higher comfort level. Those individuals with high involvement in agriculture reported being more comfortable with the material presented. Stone et al. (1991) indicated attitudes are formed from a receivers constant evaluation of a stimuli. Participants who indicated a high level of involvement in agriculture were overall more comfortable than those categorized as having a low involvement in agriculture during both slaughter videos. This finding is consistent with the theoretical framework, which suggests higher issue involvement will lead to more positive attitudes (Petty & Cacioppo, 1986). However, results also indicate greater involvement in agriculture is not without boundaries. Even those who reported strong involvement with agriculture reported increased discomfort when viewing the exsanguination process for a hog. Likewise, participants became more uncomfortable when they were presented with the CO₂ stunning of hogs, regardless of level of involvement in agriculture. These specific aspects of the hog slaughter video brought on more discomfort among the participants with high and low agricultural

involvement. These findings indicate that despite level of agricultural involvement, consumers both within and outside of the agricultural industries find similar aspects of agriculture uncomfortable. As consumers continue to play a greater role in determining agricultural policy decisions, it is important for agricultural communicators to be attuned to what consumers find uncomfortable so that literacy efforts can be developed to ensure the future of agricultural production (Gellynck, Verbeke, & Vermeire, 2006).

These decreases in comfort were observed during video of the stunning process for cattle, regardless of their level of agricultural involvement. Participants' comfort levels did not recover, but stayed at a constant before being presented with a second critical moment. Participants, regardless of level of agricultural involvement, became more uncomfortable when they were presented with the portion of the video depicting cattle hanging from their hind foot and exhibiting uncoordinated kicking of the free leg. These specific aspects of the cattle slaughter video brought on more discomfort among both those with high and low agricultural involvement. These findings align with Croney and Reynnells' (2008) findings that suggest consumers might want more transparency regarding animal welfare and processes involving animal slaughter, but do not want to know the graphic details involved in the animal slaughter process. Similarly, the receiver's perceived attractiveness of a message will impact attitude formation (Frewer et al., 1997). Due to the graphic nature of the videos, even those with high levels of agricultural involvement may find the perceived attractiveness of slaughter messages to be low leading to lower levels of perceived comfort or attitude toward the message.

Industry practitioners should realize that these critical moments elicited a cognitive shift and change in comfort level. To improve the comfort levels during these critical moments, understanding how viewers allocated cognitive processing regarding the visual aspect, the

narration, and the information presentation is important. It is possible that the order of information and sensitive graphic imagery affects what people attend to. These graphic visuals automatically compel cognitive resources. Presenting information on top of a graphic visual may result in the viewer attending to the graphic visual, over the information being presented. Presenting critical information such as, that by law, stunning must induce a state of surgical anesthesia before being bled out, prior to presenting the visual of a hog being bled out will ensure that viewers are not attending to the graphic visual over the information being presented.

One limitation to this study is the lack of generalizable results to a broader population due to the use of a purposive sample and not a random sample of the population. However, the explicit purpose of the project (i.e., comparison of populations that vary in agricultural involvement) required the need for recruitment of subjects who satisfy that purpose. These findings provide us with a clearer outline as to what aspects of the animal slaughter process consumers might be the most uncomfortable with. Further qualitative research should be conducted to determine what aspects of these critical moments consumers have the most issues with. Qualitative research such as focus group research could be used to allow consumers to explain what about the imagery concerned them the most and could help researchers better understand how consumers would like topics such as this to be depicted in a more transparent format, while being less emotionally charged.

While continuous response measurement, or moment-to-moment, equipment requires a significant monetary investment or the use of the equipment in another department or college, moment-to-moment studies should be more present in agricultural communications research. Outside of educational videos, moment-to-moment studies could be conducted with interpersonal communications content, public speaking and performance, advertising, film, television, and

programming (Biocca, Prabu, & West, 1994). As a result of the findings of this study, future research will investigate how audio information about the slaughter process prior to the graphic imagery impacts comfort levels and attitude formation about these stimuli. This future study may allow participants to better understand why these production practice must occur before they view the graphic imagery, thus potentially producing more positive evaluations of the content. Further, agricultural communicators may be able to use dial testing methodology to determine moment-to-moment effects of media on consumers including brand trust and source credibility.

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Identifying the Role of Social Skills in Agricultural Communication Programs

Research Paper

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Identifying the Role of Social Skills in Agricultural Communication Programs

Abstract

This national study sought to contribute to the Agricultural Communication Program System Model via a program evaluation to identify the importance and graduates' ability to perform selected social skills to aid in curricula evaluation and small program development. Using three evaluation groups—agricultural communication graduates, communication industry professionals, and agricultural communication faculty members—193 individuals responded to the online survey. The most important social skills were those associated with having work values and transitioning into an organization to be a productive member in the workplace. Graduates placed a higher importance on social skills than the other two evaluation groups. All three evaluation groups showed some agreement on graduates' highest ability to perform several social skills: the ability to be trustworthy, trained, reliable, professional, dedicated, and behave ethically were assigned the highest mean ability. A significant difference was found with the ability graduates afforded themselves in having common sense, being professional, and encompassing maturity versus the other two evaluation groups. Recommendations included incorporating and identifying social skills into instruction for students. Group work, presentations, internships, and student organizations were proposed as opportunities for social skill attainment. Agricultural leadership principles, oral communication, and professional development courses were recommended for new and developing agricultural communication programs that could serve to incorporate the most important social skills. Faculty members could also benefit from research that can identify more effective measures to evaluate social skill attainment. Recommendations for future research also included a similar assessment with technical skills to be conducted.

Keywords: Program evaluation, agricultural communication, agricultural communication program system model, social skill importance, social skill ability, three-tiered assessment

Introduction

Agricultural communications programs have experienced continual growth since the first agricultural communication program was established in the early 1900s. Industry and student demand has aided in the development of approximately 40 programs nationwide with student enrollment ranging from 7 to 360, averaging out to 69 students per program, with almost all programs expecting an increase over the next five years (Miller, Large, Rucker, Shoulders, & Buck, 2015). However, limited collegiate faculty members in these programs have placed a tremendous amount of responsibility on only a few people (Weckman, Witham, & Telg, 2000). While the number of faculty members per program has increased since 2000, these small clusters of faculty have been responsible for teaching, advising, recruitment, mentoring, club advisement, and graduate placement (Miller et al., 2015; Weckman et al., 2000). The strain on faculty members has forced many agricultural communication programs to rely on journalism and mass communication departments to deliver their content, placing a barrier when assessing student preparedness (Irani & Doerfert, 2013; Tucker, Whaley, & Cano, 2003). Agricultural industry professionals have reported the need for skillset improvements for agricultural communication graduates (Irlbeck & Akers, 2009).

Many employers believe graduates have not been able to convert their education into practical application. Employers have reported that college graduates have lacked a broad-based knowledge of various skills, while graduates believe they are better prepared than their employers do (Casner-Lott & Barrington, 2006; Hart Research Associates, 2015; Northeastern University, 2013). Employers have mixed reviews on how the current generation in the workforce— Millennials—have been performing (Deal, Altman, & Rogelberg, 2010; Oblinger, 2003; Taylor & Ketter, 2010). Several researchers have taken different approaches in evaluating

agricultural communication graduates' skills and knowledge as well as assessing the skills needed by these students. Social skills in particular, often referred to as people skills, have been an area of interest due to the demand from employers. Social skills are often the first observed in an interview and provide a competitive edge for job candidates (Coates, 2006; Schulz, 2008).

Irlbeck and Akers (2009) conducted a study in which 45 industry professionals, representing various national agricultural communication industry organizations, were asked about agricultural communication graduates' workplace habits and communication skills. Graduates were seen as trustworthy, easy to work with, and reliable. In contrast, common sense and organization were viewed as areas needing improvement (Irlbeck & Akers, 2009). Employers specified a need for improvement in several other workplace habits for graduates: "getting along with colleagues, pay and advancement, business etiquette, paying their dues, less reliance on email and more face-to-face communications, negotiating, office environment, time management, professional ethics, and critical thinking" (Irlbeck & Akers, 2009, p. 67).

Morgan's (2010) study determined the skills needed by agricultural communication undergraduates as perceived by industry professionals as well. Some of the highest ranked skills were conducting activities in an ethical measure, ability to meet deadlines, being dependable, having a strong work ethic, being reliable, having organizational skills, demonstrating professional/business etiquette in workplace, and being able to multitask (Morgan, 2010).

Morgan and Rucker (2013) explored a faculty perspective of the skills needed by agricultural communication undergraduates. Some of the highest-ranked skills were professional competence, critical thinking, ability to communicate orally and in writing, ethics, listening, and intellectual prowess (Morgan & Rucker, 2013). Morgan and Rucker (2013) also compared faculty members' responses in their study to the agricultural industry professionals' responses in

Morgan's (2010) study to determine whether a difference in opinion existed concerning the skills needed for agricultural communication undergraduates. Morgan and Rucker (2013) found that faculty placed the highest rank on skills related to writing, critical thinking, communication, and intellectual prowess. In comparison, industry professionals placed a higher importance on ethics, responsibility, professionalism, and organizational skills. This analysis also showed that faculty members appeared to be more focused on skills related to communications and students' ability to think, while industry professionals were focused on global skills that included accomplishing tasks.

To put the skills needed in context with the content being taught to agricultural communication students, Cannon, Specht, and Buck (2014) evaluated 17 agricultural communication programs' undergraduate course offerings, including programs that offered either a major, minor, or concentration in agricultural communication. In order of frequency, researchers classified 172 courses into 21 content-based categories: writing ($n = 24$), introduction ($n = 15$), internship ($n = 14$), writing for publication ($n = 11$), graphic design ($n = 10$), professionalism ($n = 9$), broadcast ($n = 8$), issues ($n = 8$), advertising and public relations ($n = 7$), web ($n = 7$), capstone ($n = 6$), presentations ($n = 6$), photography ($n = 6$), technology ($n = 6$), campaigns ($n = 4$), oral and written communication ($n = 4$), risk/crisis communication ($n = 4$), field experience ($n = 3$), research ($n = 3$), study abroad ($n = 3$), and international ($n = 2$; Cannon et al., 2014).

Researchers have recommended that faculty members consider the results from such studies to enhance curricula and develop career-ready graduates (Akers, Vaughn, & Lockaby, 2001; Hart Research Associates, 2015; Irlbeck & Akers, 2009; Robinson, 2006; Terry, Lockaby, & Bailey-Evans, 1995). Therefore, the purpose of this study was to contribute to the current

research by exploring the importance and agricultural communication baccalaureate graduates' ability to perform selected social skills, with the intention of aiding in curricula evaluation and small program development.

Conceptual Framework

Leal (2016) adapted Finch and Crunkilton's (1984) program system model and updated/revised it to provide more clarity in how the model operates, illustrate how previous research has contributed to the model, and to identify the areas that still require further exploration (Figure 1). The program system model was retitled as the *Agricultural Communication Program System Model* to emphasize how the needs of the agricultural communication discipline are unique.

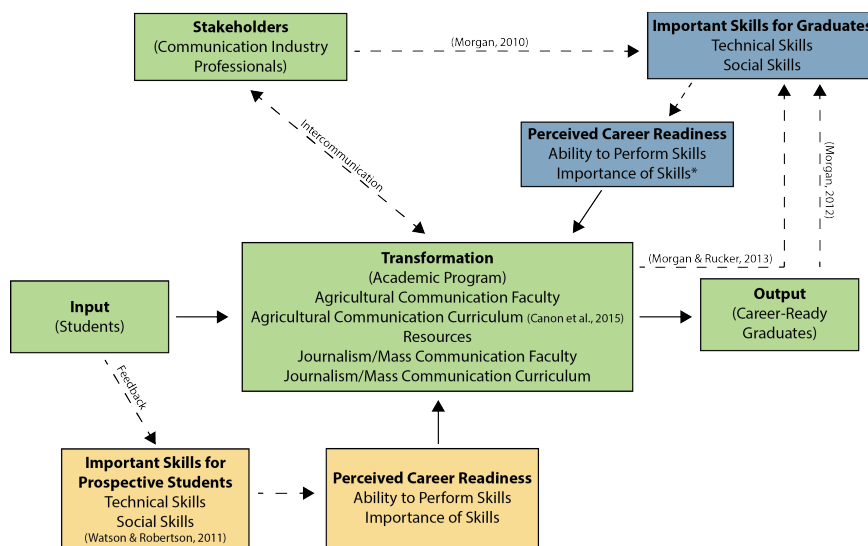


Figure 1. Agricultural Communication Program System Model. The asterisk in the blue box titled *perceived career readiness* is representative of the role this study plays in the Agricultural Communication Program System Model.

Process

The original program system model is identified with the green-shaded boxes. New students remain as the *input* for the model to provide individuals to experience the transformation process and to justify the academic program's existence. Originally called the

process, the academic program is now labeled as the *transformation* to be more reflective of the progression students go through to become career-ready graduates. Journalism/mass communication faculty members and curricula were added to the transformation process to represent the content and interactions students receive outside of agricultural communication programs. *Stakeholders*, previously identified as the *environment*, still lie on the outside of the model. However, their influence on each element of the Agricultural Communication Program System Model remains the same. Stakeholders provide the individuals and financial elements that allow the academic program to function (Chen, 2015). Communication industry professionals were also specified in this updated/revised model because they are the primary stakeholder group used in program evaluations for agricultural communication programs. The transformation remains as the intervention students will go through where their knowledge, behavior, and attitudes will change to develop them into career-ready graduates.

Feedback

The blue and yellow-shaded boxes illustrate pieces of the overall puzzle that have and have not been explored and to provide a visual representation of the role each of those pieces play. Dotted lines denote a continual process, while a solid line denotes an end product designed to feed back directly into the academic program. Each dotted line that extends away from the evaluation groups serve as the *feedback* element of the program system model. New student feedback could serve as a benchmark for students entering the academic program. Graduate feedback provides the necessary information to initiate curricula development and determine the perceived career readiness of agricultural communication graduates. An additional line was created to illustrate the constant intercommunication that should exist between industry professionals and academic programs, serving as an additional communication channel that

exceeds the traditional feedback industry professionals have provided in the program system model.

Curriculum assessments have been a collective process that require input from several sources—current students, graduates, and stakeholders. Program feedback can aid in identifying productive and hindering practices. The absence of proper assessments can lead to deteriorating programs (Chen, 2015). This process ultimately identifies how well the academic program is operating and what changes need to be made to justify its existence (Doerfert & Miller, 2006; Tucker et al., 2003).

Methods

An online survey instrument was used to collect data in this national study that collected 212 responses, which results in 193 usable responses. Agricultural communication graduates, communication industry professionals, and agricultural communication faculty members served at the three evaluation groups in this study. A total of 46 faculty members representing 25 universities and 66 graduates from 10 universities participated in this study. Eighty-one industry professionals from 58 different organizations were represented in this study as well: thirty-four agricultural organizations, 14 non-agricultural organizations, and 10 communication departments in colleges of agriculture. Additional individuals received the survey via an alumni newsletter, but it was unknown how many individuals received the newsletter. The use of the newsletter served as a limitation, but demographic information was used to ensure that each respondent received a major, minor, or concentration in agricultural communication and that they had graduated within the last 2.5 years.

A purposive sampling technique was used to recruit all three evaluation groups. Agricultural communication faculty members were identified using a study conducted by Miller

et al. (2015), which identified all agricultural communication programs in the United States. Alumni lists were requested from faculty member participants to identify 2014 and 2015 agricultural communication graduates, and communication industry professionals were identified via boards of directors and membership lists from several agricultural and non-agricultural communication industry organizations, which were located through online searches.

Qualtrics© mailer function was used to distribute the instrument and collect data in this study. A modified Dillman's (2014) Tailored Design was used in the distribution of the survey instrument. Initial email invitations were sent to all industry professionals, faculty members, and graduates. Four contacts were used with each group as response from the fifth contact and beyond have been shown to produce minimal additional data (Israel & Gouldthorpe, 2013). [University] offered to promote this study in its departmental newsletter since they were unable to share graduates' email addresses due to privacy issues.

Using two different versions of the survey instrument—graduate survey instrument and industry and faculty survey instrument—respondents were presented with 45 skills in the social skill area, which were adapted from previous studies that assessed needed skills for agricultural communication graduates to be successful in the workforce (Bailey-Evans, 1994; Irlbeck & Akers, 2009; Morgan & Rucker, 2013; Morgan, 2010; Robinson, 2006; Terry et al., 1995). To ensure each evaluation group was assessing entry-level agricultural communication graduates, communication industry professionals were asked to rate newly hired graduates' ability to perform the selected skills, faculty members/instructors were asked to rate graduates' ability to perform the selected skills by graduation day, and graduates were asked to rate their current ability to perform the selected skills. Part of a larger study, respondents were also asked

demographic questions regarding their career, education, and upbringing; however, those demographic questions were not part of this study's analyses.

Ability to perform each skill was measured on a five-point Likert-type scale where 0 = *I Don't Know*, 1 = *No Ability*, 2 = *Low Ability*, 3 = *Moderate Ability*, and 4 = *High Ability*. All evaluation groups were asked to indicate the importance of the social skills on a four-point Likert-type scale where 1 = *No Importance*, 2 = *Low Importance*, 3 = *Moderate Importance*, and 4 = *High Importance*. Measurement scales were adapted from previous studies (Blackburn, Robinson & Field, 2015; DiBenedetto, 2015), and Cronbach's alpha coefficients were calculated post data collection to confirm the reliability of the constructs used in the survey instruments: social-skills importance construct ($\alpha = .93$) and social-skills ability construct ($\alpha = .98$). Real limits were created to prevent gaps between intervals, allowing for clearly defined parameters to help with the interpretation of the importance and graduates' ability to perform the selected skills (Colwell & Carter, 2012). The real limits set for the importance scale were 1.00 – 1.49 = *no importance*, 1.50 – 2.49 = *low importance*, 2.50 – 3.49 = *moderate importance*, 3.50 – 4.00 = *high importance*, and the real limits set for the ability to perform scale were 1.00 – 1.49 = *no ability*, 1.50 – 2.49 = *low ability*, 2.50 – 3.49 = *moderate ability*, 3.50 – 4.00 = *high ability*. The answer option 0 = *I Don't Know* on the ability scale was treated as a missing value and not included in analysis.

Data were analyzed using SPSS© 22. Descriptive statistics were used to analyze objectives one and two, and data were reported using means and standard deviations. The remaining objectives were analyzed using a one-way, between groups analysis of variance. Gabriel's pairwise tests were used for the follow-up tests.

A Pearson Chi-square analysis was used to compare early and late respondents to address the external validity threat of nonresponse (Miller & Smith, 1983). For the graduate survey instrument used in this study, a Chi-square analysis was used to compare where early and late respondents lived when they grew up ($\chi^2 = 1.63, \rho = .44$) and by their immediate family's involvement in the agricultural industry ($\chi^2 = 2.65, \rho = .27$). The same statistical comparison was calculated for the industry and faculty survey instrument, using where early and late respondents lived when they grew up ($\chi^2 = 4.38, \rho = .22$) and their immediate family's involvement in the agricultural industry ($\chi^2 = .04, \rho = .98$). No statistically, significant difference was observed between early and late respondents for either survey instrument.

Results

Importance of Social Skills

When asked to rate the level of importance for social skills (Table 1), communication industry professionals placed the highest mean importance on the ability to behave ethically ($M = 4.00, SD = .00$), be trustworthy ($M = 4.00, SD = .00$), be reliable ($M = 4.00, SD = .00$), to listen ($M = 3.99, SD = .11$), be dependable ($M = 3.99, SD = .11$), have good work ethic ($M = 3.98, SD = .16$), be professional ($M = 3.98, SD = .16$), be trained ($M = 3.96, SD = .19$), and the ability to have good time management ($M = 3.95, SD = .22$).

The highest mean importance for social skills as perceived by agricultural communication graduates was placed on the ability to behave ethically ($M = 4.00, SD = .00$), use common sense ($M = 4.00, SD = .00$), have good work ethic ($M = 3.98, SD = .12$), to listen ($M = 3.98, SD = .12$), to problem solve ($M = 3.98, SD = .12$), be professional ($M = 3.98, SD = .12$), be trustworthy ($M = 3.98, SD = .12$), and the ability to be reliable ($M = 3.98, SD = .12$).

Agricultural communication faculty members/instructors placed the highest mean importance for social skills on the ability to be professional ($M = 3.98$, $SD = .15$), to listen ($M = 3.96$, $SD = .21$), use critical thinking ($M = 3.96$, $SD = .21$), be dependable ($M = 3.96$, $SD = .21$), have good work ethic ($M = 3.93$, $SD = .25$), to problem solve ($M = 3.93$, $SD = .25$), be trustworthy ($M = 3.93$, $SD = .25$), and the ability to be trained ($M = 3.93$, $SD = .25$).

Table 1. Importance of social skills

Skill	Industry (<i>n</i> = 79) <i>M</i> (<i>SD</i>)	Graduates (<i>n</i> = 66) <i>M</i> (<i>SD</i>)	Faculty (<i>n</i> = 44) <i>M</i> (<i>SD</i>)
Ability to Behave Ethically	4.00(.00)	4.00(.00)	3.91(.29)
Ability to be Trustworthy	4.00(.00)	3.98(.12)	3.93(.25)
Ability to be Reliable	4.00(.00)	3.98(.12)	3.91(.29)
Ability to Listen	3.99(.11)	3.98(.12)	3.96(.21)
Ability to be Dependable	3.99(.11)	3.97(.17)	3.96(.21)
Ability to Have Good Work Ethic	3.98(.16)	3.98(.12)	3.93(.25)
Ability to be Professional	3.98(.16)	3.98(.12)	3.98(.15)
Ability to be Trained	3.96(.19)	3.95(.21)	3.93(.25)
Ability to Have Good Time Management	3.95(.22)	3.94(.24)	3.91(.29)
Ability to use Common Sense	3.94(.25)	4.00(.00)	3.84(.37)
Ability to Communicate Interpersonally	3.94(.24)	3.89(.31)	3.91(.29)
Ability to Problem Solve	3.93(.31)	3.98(.12)	3.93(.25)
Ability to be Adaptable	3.93(.26)	3.97(.17)	3.91(.29)
Ability to Communicate Intrapersonally	3.90(.41)	3.89(.31)	3.70(.59)
Ability to be Self-Motivated	3.90(.30)	3.92(.27)	3.82(.39)
Ability to Engage in Team Work	3.89(.35)	3.89(.36)	3.83(.38)
Ability to be Dedicated	3.89(.32)	3.94(.24)	3.70(.47)
Ability to use Critical Thinking	3.89(.32)	3.97(.17)	3.96(.21)
Professional Competence	3.89(.32)	3.95(.21)	3.83(.38)
Ability to Think Independently	3.88(.33)	3.95(.21)	3.89(.32)
Ability to be Deadline-Oriented	3.87(.34)	3.95(.21)	3.89(.32)
Have a Positive Attitude	3.86(.35)	3.85(.36)	3.66(.57)
Respectful of Others' Opinions, Values, & Beliefs	3.85(.36)	3.94(.30)	3.87(.34)
Ability to be Organized	3.80(.44)	3.95(.21)	3.78(.42)
Communicate with Individuals of all Educational Levels	3.78(.45)	3.94(.24)	3.70(.51)
Ability to Multitask	3.77(.48)	3.85(.36)	3.49(.63)
Ability to be Detail Oriented	3.75(.47)	3.88(.37)	3.69(.47)
Ability to use Professional/Business Etiquette	3.75(.47)	3.92(.27)	3.77(.42)
Ability to be Self-Aware	3.70(.52)	3.85(.36)	3.59(.54)
Communication Instinct	3.69(.52)	3.88(.33)	3.37(.85)
Ability to use Critical Analysis	3.69(.49)	3.82(.43)	3.70(.47)
Ability to Think Quickly	3.68(.50)	3.89(.36)	3.56(.50)
Appreciate Precision with Words	3.67(.55)	3.83(.41)	3.68(.52)
Encompass Maturity	3.67(.52)	3.95(.21)	3.77(.42)

Ability to be Creative	3.67(.50)	3.79(.48)	3.57(.50)
Ability to Dress Professionally	3.66(.58)	3.85(.44)	3.64(.53)
Appreciation of Language	3.63(.56)	3.77(.46)	3.54(.66)
Ability to be Optimistic	3.63(.54)	3.74(.47)	3.36(.53)
Network with Other Professionals	3.62(.54)	3.85(.44)	3.66(.48)
Ability to be Intuitive	3.59(.54)	3.80(.44)	3.51(.55)
Ability to be Confident	3.57(.55)	3.83(.38)	3.57(.50)
Ability to be Analytical	3.53(.63)	3.77(.46)	3.65(.48)
Ability to Strategize	3.52(.57)	3.80(.44)	3.53(.51)
Ability to use Persuasive Communication	3.49(.57)	3.79(.48)	3.54(.50)
Ability to be a Leader	3.39(.59)	3.73(.51)	3.44(.55)

Note: 1.00 – 1.49 = no importance, 1.50 – 2.49 = low importance, 2.50 – 3.49 = moderate importance, 3.50 – 4.00 = high importance. Skills are order from most important to least important per communication industry professionals.

Ability to Perform Social Skills

When asked to indicate graduates' ability to perform social skills (Table 2), communication industry professionals placed the highest mean ability on graduates' ability to behave ethically ($M = 3.58$, $SD = .60$), have a positive attitude ($M = 3.58$, $SD = .55$), be optimistic ($M = 3.55$, $SD = .58$), be trained ($M = 3.52$, $SD = .56$), be dependable ($M = 3.51$, $SD = .56$), engage in team work ($M = 3.49$, $SD = .58$), be trustworthy ($M = 3.49$, $SD = .61$), be reliable ($M = 3.43$, $SD = .63$), and the ability to be confident ($M = 3.42$, $SD = .58$).

Graduates' highest mean ability to perform social skills as perceived by agricultural communication graduates were the ability to have good work ethic ($M = 4.00$, $SD = .00$), be trustworthy ($M = 3.98$, $SD = .12$), behave ethically ($M = 3.97$, $SD = .17$), be dependable ($M = 3.97$, $SD = .17$), be reliable ($M = 3.97$, $SD = .17$), use common sense ($M = 3.97$, $SD = .17$), be dedicated ($M = 3.95$, $SD = .21$), be professional ($M = 3.95$, $SD = .27$), be trained ($M = 3.94$, $SD = .24$), and encompass maturity ($M = 3.94$, $SD = .24$).

Agricultural communication faculty members/instructors placed graduates' highest mean ability to perform social skills (Table 4-13) on the ability to behave ethically ($M = 3.58$, $SD = .55$), be trustworthy ($M = 3.56$, $SD = .50$), be dedicated ($M = 3.51$, $SD = .59$), be professional ($M = 3.51$, $SD = .59$), have a positive attitude ($M = 3.50$, $SD = .51$), have good work ethic ($M = 3.49$,

$SD = .59$), be trained ($M = 3.49$, $SD = .59$), communicate interpersonally ($M = 3.47$, $SD = .55$), be dependable ($M = 3.46$, $SD = .56$), and the ability to network with other professionals ($M = 3.45$, $SD = .60$).

Table 2. Graduates' ability to perform social skills

Skill	Industry ($n = 70$) $M(SD)$	Graduates ($n = 66$) $M(SD)$	Faculty ($n = 39$) $M(SD)$
Have a Positive Attitude	3.58(.55)	3.82(.39)	3.50(.51)
Ability to Behave Ethically	3.58(.60)	3.97(.17)	3.58(.55)
Ability to be Optimistic	3.55(.58)	3.76(.53)	3.29(.56)
Ability to be Trained	3.52(.56)	3.94(.24)	3.49(.59)
Ability to be Dependable	3.51(.56)	3.97(.17)	3.46(.56)
Ability to Engage in Team Work	3.49(.58)	3.80(.44)	3.44(.59)
Ability to be Trustworthy	3.49(.61)	3.98(.12)	3.56(.50)
Ability to be Confident	3.42(.58)	3.73(.51)	3.37(.66)
Ability to be Reliable	3.43(.63)	3.97(.17)	3.39(.59)
Professional Competence	3.32(.55)	3.89(.31)	3.14(.56)
Ability to be Self-Motivated	3.39(.62)	3.85(.40)	3.31(.61)
Ability to be Creative	3.38(.62)	3.55(.61)	3.19(.59)
Ability to be Professional	3.36(.63)	3.95(.27)	3.51(.59)
Respectful of Others' Opinions, Values, & Beliefs	3.39(.66)	3.89(.31)	3.29(.60)
Ability to be Organized	3.34(.61)	3.80(.47)	3.27(.50)
Ability to Multitask	3.36(.64)	3.77(.49)	3.20(.60)
Network with Other Professionals	3.35(.63)	3.61(.63)	3.45(.60)
Ability to be Dedicated	3.38(.68)	3.95(.21)	3.51(.59)
Ability to Communicate Interpersonally	3.32(.62)	3.86(.39)	3.47(.55)
Ability to Think Independently	3.32(.62)	3.92(.27)	3.14(.67)
Ability to Communicate Intrapersonally	3.29(.61)	3.83(.45)	3.30(.71)
Ability to Think Quickly	3.27(.59)	3.74(.54)	3.17(.54)
Ability to be Deadline-Oriented	3.33(.67)	3.89(.36)	3.37(.58)
Encompass Maturity	3.24(.62)	3.94(.24)	3.23(.58)
Ability to Have Good Work Ethic	3.32(.72)	4.00(.00)	3.49(.59)
Ability to be Adaptable	3.28(.68)	3.91(.29)	3.02(.71)
Ability to Listen	3.27(.69)	3.85(.36)	3.30(.64)
Ability to use Critical Thinking	3.25(.68)	3.83(.45)	3.21(.68)
Ability to be Detail Oriented	3.24(.67)	3.71(.55)	3.10(.54)
Ability to use Common Sense	3.29(.72)	3.97(.17)	3.21(.57)
Ability to use Professional/Business Etiquette	3.22(.68)	3.89(.36)	3.37(.58)
Ability to Problem Solve	3.21(.69)	3.88(.33)	3.23(.65)
Ability to be Self-Aware	3.21(.69)	3.85(.36)	3.10(.60)
Ability to Dress Professionally	3.25(.73)	3.88(.41)	3.34(.58)
Ability to be a Leader	3.06(.55)	3.80(.53)	3.29(.60)
Communicate with Individuals of all Educational Levels	3.19(.71)	3.80(.44)	2.93(.85)
Appreciation of Language	3.16(.69)	3.68(.53)	2.95(.72)
Ability to Have Good Time Management	3.15(.72)	3.74(.51)	3.14(.60)

Ability to use Persuasive Communication	3.07(.64)	3.62(.63)	3.12(.63)
Ability to be Intuitive	3.06(.65)	3.68(.56)	3.00(.66)
Communication Instinct	3.14(.74)	3.73(.48)	2.95(.62)
Ability to use Critical Analysis	3.04(.68)	3.65(.54)	3.05(.71)
Appreciate Precision with Words	3.10(.75)	3.73(.54)	2.98(.66)
Ability to be Analytical	2.95(.66)	3.65(.57)	2.84(.75)
Ability to Strategize	2.92(.69)	3.68(.50)	2.90(.62)

Note: 1.00 – 1.49 = no ability, 1.50 – 2.49 = low ability, 2.50 – 3.49 = moderate ability, 3.50 – 4.00 = high ability. Skills are order from highest ability to lowest ability per communication industry professionals.

Importance Comparison

The grand mean for the importance of social skills per each evaluation group was 3.79 ($SD = .19$) for communication industry professionals, 3.90 ($SD = .15$) for agricultural communication graduates, and 3.74 ($SD = .23$) for agricultural communication faculty members/instructors. A one-way, between groups analysis of variance showed there was a significant mean difference in the perceived importance of social skills between each evaluation group, $F(2, 190) = 11.03, p < .001$ (Table 3). A post hoc analysis using the Gabriel's test was conducted and a significant difference was observed between the evaluation groups. A significant mean difference was found between industry professionals and graduates ($p = .002$). The results showed industry professionals perceived importance of social skills was .12 lower than graduates. A significant mean difference was also found between faculty members/instructors and graduates ($p < .001$) that showed faculty members/instructors perceived importance of social skills was .16 lower than graduates.

Table 3. Comparison of social skills' importance

	SS	df	MS	<i>F</i>	<i>p</i>
Between Groups	.78	2	.390	11.03	.000
Within Groups	6.72	190	.035		
Total	7.50	192			

Ability Comparison

The grand mean for ability to perform social skills per each evaluation group was 3.29 ($SD = .44$) for communication industry professionals, 3.82 ($SD = .21$) for agricultural

communication graduates, and 3.24 ($SD = .41$) for agricultural communication faculty members/instructors. A one-way, between groups analysis of variance showed there was a significant mean difference in graduates' ability to perform the social skills between each evaluation group, $F(2, 180) = 47.80, p < .001$ (Table 4). A post hoc analysis using the Gabriel's test was conducted and a significant difference was observed between the evaluation groups (Table 8). A significant mean difference was found between industry professionals and graduates ($p < .001$). The results showed graduates' ability to perform social skills as perceived by industry professionals was .53 lower than graduates. A significant mean difference was also found between faculty members/instructors and graduates ($p < .001$), which showed graduates' ability to perform social skills as perceived by faculty members/instructors was .58 lower than graduates.

Table 4. Comparison of graduates' ability to perform social skills

	SS	df	MS	<i>F</i>	<i>p</i>
Between Groups	12.74	2	6.37	47.80	.000
Within Groups	23.98	180	.13		
Total	36.72	182			

Conclusions/Implications

Importance

Social skills are necessary skills in the workplace, and several studies have shown that employers believe social skills are important (Morgan & Rucker, 2013; Irlbeck & Akers, 2009; Robinson, 2006). Overall, all social skills were identified as having moderate importance or high importance. Results in this study showed that the most important social skills were those associated with having positive work values and transitioning into an organization to be a productive member in the workplace. This finding was observed across all three evaluation groups and received mean values of 3.91 and higher. Several studies have found that employers believe professionalism, work ethic, and decision making/problem solving skills problem solving

as the most important or highest ranked skills needed for graduates (Casner-Lotto & Barrington, 2006; Morgan & Rucker, 2013; Morgan, 2010; Robinson 2006).

The results in this study are representative of the findings from several studies within and outside of the agricultural field. It appears some of the most important social skills needed by agricultural communication graduates partially mirror what researchers have found that employers are looking for in all college graduates. This finding implies that social skills required of agricultural communication graduates may be similar to those expected of all college graduates.

Current curricula show that professionalism/professional development and leadership courses include content that incorporates social skills, which typically cover topics such as ethics, networking, and interviewing for jobs (Cannon et al., 2015). Current courses show a presence of social skills content included in the curricula but may not be covering all needed social skills. Other courses may be including some social skills as part of their content but the difficulties with observing and quantifying some of these skills can make it difficult to evaluate social skill presence (Coates, 2006). Cannon et al. (2015) was not able to evaluate and survey all agricultural communication programs and faculty members/instructors, so there may be a higher presence of courses including social skills than current research indicates. Social skills will have to be incorporated into the curricula or be identified as being present to ensure graduates are prepared for the workforce. The presence of social skills does not necessarily guarantee that students will learn the content, but it does show that agricultural communication programs are making every effort to prepare graduates.

The researcher also explored and found a significant difference between the level of importance graduates placed on social skills versus industry professionals and faculty

members/instructors. Agricultural communication graduates appear to be cognizant of social skills' importance and place a higher mean importance on social skills than the other two evaluations groups. This importance placed on social skills has been supported by previous studies with employers (Bentley University, 2014; Northeastern University, 2013).

Several studies have characterized Millennials as valuing social skills, noting their ability to be more confident, adaptable, optimistic, expressive, and respectful (Oblinger, 2003; Taylor & Ketter, 2010). Millennials' value system may be reflective of the importance graduates placed on social skills. With the impact and influence that the environment and economy have on the development of a generation's behaviors, attitudes, beliefs, and sensitivities (Deal et al., 2010; Oblinger, 2003), society's increased focus on graduates developing social skills to enter the workforce over the last decades may have impacted the importance graduates placed on social skills as well (Schulz, 2008).

Identifying the importance of social skills serves to better inform the discipline, but the extent to which agricultural communication graduates are performing these skills by graduation and at the time of employment in the workforce is equally important, if not more important, to determine.

Ability

The researcher examined agricultural communication graduates' ability to perform the selected social skills. All three evaluation groups showed some agreement on graduates' highest ability to perform several social skills. The ability to be trustworthy, trained, reliable, professional, dedicated, and behave ethically were assigned the highest mean ability. Graduates rated their ability of having common sense, being professional, and encompassing maturity higher than both faculty members/instructors and industry professionals.

Graduates' highest mean social-skill abilities in this study align with a few of the highest mean important social skills like being trustworthy, being reliable, being trained, and behaving ethically that was found in Irlbeck and Akers' (2009) study with employers. This finding implies that graduates are performing some of the highest mean important social skills well. However, social skills ranked with the highest mean importance by graduates—having common sense and being professional—were also afforded the highest mean ability by graduates. This was not a similar ranking of ability with industry professionals and faculty members/instructors. Industry professionals and faculty members/instructors afforded graduates with a moderate ability to be professional and have common sense.

From a holistic viewpoint, it is important to remember that all social skills were characterized as either moderate or highly important. However, with rank of ability aside, only five skills from industry professionals and six from faculty members/instructors were characterized above high ability. No skill was assigned a mean value of less than 3.55 (high ability) by graduates. The difference in opinion was found to be significant.

Professionalism/professional development and leadership courses that include some social-skill content may be offered by several agricultural communication programs, but graduates ability to perform those social skills does not appear to be high. The difference in opinion suggests that graduates believe they are more capable of performing social skills than in reality. Technology presence in Millennials' lives may be changing their ability perform some social skills. With the environment and life experiences playing a role in generational behavior (Deal et al., 2010; Oblinger, 2003), Millennials may be interpreting their ability to perform social skills as acceptable while older generations disagree. It is possible that some of the current courses delivering social-skills content are not addressing the needed social skills and that

students are not receiving the social skills they need in other classes as well. It is also possible that there are external factors, such as personality and family history, affecting graduates' ability to perform social skills.

Social skills are no longer viewed as optional and have become increasingly important employability skills needed by graduates (Schulz, 2008). Providing students with these types of skills by graduation has the ability to give them an edge in the competitive job market and more successful in their careers. Though they are more difficult to observe or quantify, social skills are often the first skills graduates use and employers see when they show up for their interview (Schulz, 2008).

Recommendations

Assessing the importance of the selected social skills and graduates' ability to perform those skills was informative and served as a positive reinforcement for faculty members efforts in preparing graduates, but improvements can help with graduates' competitiveness when seeking employment (Casner-Lott & Barrington, 2006; Hart Research Associates, 2015).

As previously mentioned, social skills will have to serve a role in the current curricula. Professionalism/professional development and leadership courses are important vehicles for providing students the opportunity to learn social skills, but these skills will need to be focused on in all classes. Several courses in the curricula may have social skills embedded in them, which may be the reason students are not recognizing their presence. Social skills need to be identified and worked into instruction. Altering students' social skill behaviors requires changing old behaviors, which requires repetition (Schulz, 2008). Implications in this study reiterate the importance of ensuring faculty members/instructors are intentionally incorporating social skills in their courses to prepare graduates while balancing the curricula with the most important

technical skills as well. Agricultural communication programs need to focus on social skills in the curricula and find a way to engage students in activities that require social skills to be used.

It may serve students well if faculty members/instructors specifically identify the social skills that are intended to be covered in the course. Implementing group work, presentations, and assignments with minimal direction to promote creative and independent thinking are a few ideas to incorporate social skills into the curricula. It may also benefit students if each assignment that was intended to promote social skills was discussed beforehand and/or after the fact. While it is important for learning objectives to guide all assignments, it should be made clear to students what the learning objectives are for social-skills based assignments, ensuring they are not missing the desired goal of the assignment.

Social skills are difficult to observe and quantify, but an attempt by faculty members/instructors to include social skills on rubrics could further emphasize the expected social skills to be learned from assignments. Internships, apprenticeships, and student organizations could also serve as additional opportunities for students to apply the knowledge and skills they have learned in the classroom, allowing them to develop social skills, which can solidify their learning. Practical application opportunities like these can become available through relationships built between faculty members/instructors and industry professionals (Accenture, 2013; Morgan, 2012; Robinson, 2006; Sprecker & Rudd, 1997).

To aid newly established and developing programs, using the findings in this study, it is recommended that oral communication, professional development and agricultural leadership principles courses be included in the initial curricula additions for agricultural communication programs. These courses encompass some of the most important social skills needed for agricultural communication students (Canon et al., 2014).

Differences between social and technical skill areas in agricultural communication programs could be further explored through future research as well. This research could provide further clarification and direction as faculty members develop curricula with social skills in mind. Researchers should continue studying methods to more effectively measure/evaluate social skill attainment to aid faculty members in curricula decisions. Additional research should evaluate the content being offered in agricultural communications programs further to determine if the most important social skills are being included in the current curricula, adding a more in-depth evaluation to the Agricultural Communication Program System Model.

Future research should explore the differences in opinion found in graduates' ability to perform social skills, and researchers should also determine what other factors (personality, demographics, family history) affect graduates' ability to perform social skills. Since perceived ability can be viewed as a subjective evaluation, the development and use of an instrument that could more precisely measure graduates' ability could also provide a more conclusive measurement of skills attainment. Additional research should include a similar evaluation of technical skills to contribute to the Agricultural Communication Program System Model, which could provide a more complete picture of agricultural communication graduates' career readiness. Several institutions did not have permission to share their alumni database, which served as a limitation in this study, so future research should determine how a larger, more reflective sample of graduates can be obtained.

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**Visualizing Values: A Content Analysis to Describe a Value Congruent Video Message
Campaign Used in Agriculture**

Research Paper

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Visualizing Values: A Content Analysis to Describe a Value Congruent Video Message Campaign Used in Agriculture

Abstract

Visual messaging is becoming the new avenue to connect with consumers. The majority of the American public is not connected with agriculture and often question procedures, practices, and tactics within the industry. Practitioners and researchers have suggested value congruent messages, a type of emotional appeal, may increase attention to agricultural messages. Limited research has been completed to investigate value congruent messages in agricultural communications. The purpose of this study was to describe the presented messages in videos used in one agricultural advocacy effort, CommonGround's "Nothing to Fear Here" campaign. This quantitative content analysis described the video's message structure, content, and use of value congruent messages. Schwartz Theory of Basic Human Values (2012) was used to identify the values present in each video within the campaign. The values present were benevolence, security, self-direction, universalism, and hedonism were common values in the campaign. The message sensation value of the videos indicated they had moderate levels of emotional arousal. The primary characters in the videos were mothers, farmers, and children. Drawing upon theories of information processing and persuasion, the researchers suggest value congruent messages may allow for higher levels of cognitive processing leading to attitude change after exposure. More research should be conducted to explore the how value congruent messages and message sensation value interact to increase a receiver's level of attitude change after viewing the message.

Keywords: message sensation value, value congruent messages, framing, message appeals, videos

Visualizing Values: A Content Analysis to Describe a Value Congruent Video Message Campaign Used in Agriculture

Introduction and Literature Review

As the global population grows to nine billion people by 2050, many members of the American public, including decision makers for agricultural policy, are not aware of the substantial challenge the world is facing in regard to sustaining a viable agriculture system (Doerfert, 2011). This uninformed population may have detrimental impacts on the future of the U.S. and global food system. However, education and communication efforts can address this knowledge deficiency. “An informed citizenry, including policy decisions at all levels, will create win-win solutions that ensure the long-term sustainability of agriculture, natural resources, and quality of life in communities across the world” (Doerfert, 2011, p. 8).

To provide more information about agriculture that resonates with the public, researchers and practitioners have suggested agricultural communicators should use value congruent message appeals (Center for Food Integrity, 2014; Krause, Meyers, Irlbeck, & Chambers, 2015). Communicators must provide messages that resonate with a public audience to build trust in agricultural practices (Steede, Gorham, & Irlbeck, 2016). One way communicators can create messages that resonate with audience members is to acknowledge their social and personal beliefs. The Center for Food Integrity (2014) stated “connecting through shared values is the first step” to building trustworthy conversations with the public (p. 16). When developing these messages, the communicator’s goal should not be “to win a scientific or social argument, but to find more meaningful and relevant methods to introduce science and technology in a way that encourages thoughtful consideration and informed decision making” (Center for Food Integrity, 2014, p. 8).

Recent agricultural advocacy campaigns have adopted this approach to messaging with information presented that is both information and congruent with audience members' values. One such organization is the Find our CommonGround advocacy group, developed by farmers and supported by the United Soybean Board and National Corn Growers Association. This organization is comprised of women farmers "having conversations about the food we grow and how we produce it. We share our personal experiences, as well as science and research,." (Find our CommonGround, 2015, para. 6). To generate these conversations, CommonGround's mission has been to combine personal experiences with relevant scientific research "to help consumers like you sort through the myths and misinformation surrounding food and farming" (Find our CommonGround, 2016, para. 6). This agricultural advocacy initiative provides two-way communication face-to-face, through a website with regular blog posts, and via social media outlets.

Social media outlets have provided a place where organizations can create and share visual content to gain attention and encourage audience engagement to influence attitudes and behavior (Jenkins, Ford, & Green, 2013). Video content in particular is increasing in popularity. In 2015, online video traffic account for 70% of global consumer Internet use (Cisco, 2016). By 2020, Cisco (2016) predicted online video access will account for 82% of all global consumer Internet traffic.

YouTube, the second largest search engine, allows individuals to watch videos and engage in the content via sharing, liking, and commenting (Susarla, Oh, & Tan, 2012). More than one billion people use YouTube and people watch hundreds of millions of hours of videos every day (YouTube, n.d.). The more engaged an individual becomes with the video, the more likely the video will impact their behavior or attitude (Susarla et al., 2012). If consumers are

receiving their information online through video messages (Golan, & Zaidner, 2008), then video messaging plays a vital part in advertisements and campaigns for agriculture. The creation and distribution of effective video messages could play an important part in improving trust in and attitudes toward the agricultural industry.

Although researchers and practitioners have suggested value congruent messages should be used in agricultural communications, little research has defined value congruent messages and the content within them. This study sought to identify the visual and audio content in one recent online video campaign, “Nothing to Fear Here” from the Find our CommonGround association, and determine if the videos contained value congruent messages.

Conceptual and Theoretical Framework

To communicate with the public about agricultural issues, video messages may be structured in a persuasive manner to resonate with a specific audience. In public relations and strategic communications, communicators have shown interest in understanding how messages may be designed to produce the highest level of cognitive processing to influence an attitude change (Shen & Bigsby, 2013). Shen and Bigsby (2013) identified three components of a message that may be manipulated to result in higher levels of persuasion – content, structure, and style.

Message Content

The message’s content refers to the “topic, theme, or story being told (including plot and characters)” (Shen & Bigsby, 2013, p. 20). Framing theory has been used to select a topic or theme of the message. Framing involves the selection of portions of the information from a larger message and making them more noticeable to perform four main functions: define problems, diagnose causes, make moral judgments, and/ or suggest remedies (Entman, 1993).

When a communicator frames a message, it may appear as if the message appeals to a specific audience segment. Agricultural communications, researchers have suggested message appeals must provide a theme congruent with values, culture, or social aspects while also providing the necessary information to discuss the topic at hand (Abrams & Meyers, 2010; Gorham, Rumble, & Holt, 2015; Goodwin et al., 2011; Krause et al., 2016). Communicators may appeal to consumers by emphasizing social benefits of a particular issue, such as purchasing local food or appealing to emotion by adding empathy to persuade a voter to support a specific legislation (Goodwin et al., 2011; Gorham et al., 2015). Communicators have also found the use of social and personal message appeals in water conservation research has increased attitudes toward participating in conservation behaviors (Warner, Rumble, Martin, Lamm, & Cantrell, 2015). Similarly, in Goodwin et al.'s (2011) study, consumers in focus groups were shown 10 messages related to agriculture. Of the 10 messages, researchers found consumers deemed six of the messages “un-favorable” and the remaining four were deemed “favorable” (Goodwin et al., 2011). The groups indicated language such as, “stewards of the land” and “wide open green pastures,” as favorable. The idea of farmers nurturing their natural resources and deeply caring about their influence on the environment resonated well with consumers. On the other hand, messages such as “best management practices” and “scientifically proven, sociably responsible and economically sound” were viewed as into un-favorable feelings and had negative perceptions. Study participants said this language had too much potential for bias and created a feeling of distrust after viewing them (Goodwin et al., 2011).

Communicators have used one of two types of common message appeals – emotional or logical – to frame messages so they have the desired impact on the target audience, (Brader, 2006; Krause et al., 2015). In the use of a logical message appeal, the communicator relies on

only the facts to portray the message and minimizes emotions (Brader, 2006). In contrast, an emotional appeal would put forth the same information, but the communicator uses references, audio content, and music in an attempt to evoke emotions from the receiver (Brader, 2006). “An emotion is not technically a property of an ad, but rather a response that the ad may or may not elicit from those who view it” (Brader, 2006, p. 5). Since the inception of advertisements via television and other media in the 1950s, political advertisements have been framed with both logical and emotion appeals (Kaid & Johnston, 2001).

Communicators use value congruent appeals to connect with a receiver on an emotional and personal level in order to prompt a change in attitude. To do so, the communicator must first understand a consumer’s values associated with agriculture. Then they can develop framed messages targeted toward influencing the consumer to think positively about agriculture (Goodwin et al., 2011). Value congruent emotional message appeals have allowed communicators to make information relevant to the audience’s current values, social beliefs, personal beliefs, and cultural connotations (Schultz & Zelzeny, 2003). Previously, political communicators have used this type of message appeal to increase an audience’s issue involvement and personal relevancy, which makes the message more salient to the audience member (von Borgstede, Andersson, & Hansla, 2014). In addition to improving the saliency of the message, researchers have suggested value congruent messages may increase the level of information processing, and ultimately attitude formation, that occurs during message consumption (von Borgstede et al., 2014). Therefore, value congruent messages provide an avenue for communicators to provide consumers information in a way that resonates with their beliefs.

The researchers used Schwartz Theory of Basic Human Values (2012) as a framework to identify the values present in each video within the campaign. Every individual has numerous values that all hold varying degrees of importance (Schwartz, 2012). According to Schwartz (2012), six main features are correlated with values: 1) beliefs leading to change; 2) desirable goals that motivate action; 3) values transcending in situations; 4) standards set by values; 5) order of importance in values; and 6) importance of values guiding action. According to the theory, there are 10 different values most individuals can relate to and live by (Table 1).

Table 1. *Schwartz (2012) Description of Basic Human Values*

Value	Definition
Self-Direction	An independent thought or action to choose something different than the norm. This is typically associated with creating or exploring.
Stimulation	Derives from the organismic need for excitement or a challenge in one's life.
Hedonism	A value directly associated with gratification from oneself and pleasure associated with fulfilling themselves.
Achievement	The desire for personal success in social situation. It is the desire to demonstrate ones skill when compared to the social norm or standard.
Power	The desire to be the dominant in a social situation. Words associated with power could be prestige or control.
Security	Directly associated with safety and harmony. While some security values are associated more individually, others can be expressed on a wider group like national security.
Conformity	The desire or goal to maintain the social expectation. One focused on conformity attempts to fit in smoothly with groups and conform to the norm.
Tradition	Associated with commitment to customs established long ago. An example of tradition is best seen in culture or religious traditions.
Benevolence	The desire to enhance the welfare of those around an individual. This value is seen typically in a mother and child relationship or those similar. Benevolence would be characterized as mature love.
Universalism	The goal is to maintain welfare for all people and nature.

According to Shen and Bigsby (2013), message content describes the topic or theme of the message as well as the type of characters that should be present in the visual media. The Center for Food Integrity (2015) suggested consumers are more likely to respond favorably to

familiar-type people such as parents of children and farmers who produce their food as opposed to scientists and corporations. Additionally, Hughner, McDonagh, Shultz, and Stanton (2007) found parents, especially of young children, are the most likely to be concerned with where their food comes from. Perceived source credibility has an impact on whether or not a receiver processes a message (Petty & Cacioppo, 1986). Consumers are most likely to trust sources that they connect with such as friends and other parents as opposed to scientists (Center for Food Integrity, 2015).

Message Structure

The manipulations of style and structure – such as edits, music, and pacing – are features within the mediated messages (Shen & Bigsby, 2013). Additionally, Brader (2006) found emotional appeals must be structured to be consistent with the mood the creator strives to establish. One approach to describing the emotional structure of video content to determine the message sensation value (Morgan, Palmgreen, Stephenson, Hoyle, & Lorch, 2003). Message sensation value is “the degree to which formal and content audio-visual features of a televised message elicit sensory, affective, and arousal responses” (Palmgreen et al., 1991, p. 219).

Emotional arousal has been connected to higher levels of perceived interest in a video, and it has played a key role in the information processing and ultimately, the persuasiveness of a message. Because emotional arousal influences an individual’s motivation to process a message (Harrington, Lane, Donohew, Zimmerman, & 2006), when the video creator manipulates the variables of audio, visual, and content in videos, superior levels of message sensation are produced, resulting in greater stimulation of emotional arousal during information processing (Morgan et al., 2003; Paek, Kim, & Hove, 2010).

Purpose and Objectives

Prior research has suggested a need for agricultural communicators to create value congruent message appeals in persuasive campaigns (Krause et al., 2015; Center for Food Integrity, 2015). The purpose of this study was to identify and describe the value congruent messages presented in CommonGround's "Nothing to Fear Here" campaign. Researchers chose to analyze this specific campaign because it is an agricultural advocacy group that uses actual farmers to share information about a variety of topics pertinent to many within the industry. The following objectives guided the study:

1. Describe the audio and visual message structure present in the campaign videos.
2. Describe the type of on-camera sources and characters in the campaign videos.
3. Identify the number and types of values presented in the campaign videos.

Methods

The research design for this study was a quantitative content analysis. A content analysis may be used to make valid inferences to identify trends and patterns from data by assigning numbers to demonstrate variation (Krippendorff, 1980). This method may also be used to provide a systematic, objective, and quantitative manner to measure and analyze communication messages to describe content, explore the media image, and establish a need for other studies (Krippendorff, 1980).

The focus of this content analysis was to identify and describe the message content and structure of the United Soybean's Find our CommonGround initiative, "Nothing to Fear Here" campaign. The YouTube campaign was implemented in September 2015, and the 10 videos feature female farmers discussing common myths and misperceptions of the agricultural industry. The video topics were: sustainability, organic foods, hormones in milk, genetically

modified organisms, food safety, food prices, family ownership, antibiotics, animal welfare, and a general overview of agriculture. Each of the videos was approximately 2 minutes long.

A researcher-developed codebook aided the researchers in analyzing the content of the videos. The codebook had three sections: 1) structure of the videos, 2) type of on-camera sources, and 3) values presented in the campaign. To address RO1, the first section of the codebook determined the message sensation value of the videos. Message sensation value was calculated via Morgan et al.'s (2003) calculation where number of cuts and the presence or absence of certain message characteristics (*0 = absent, 1 = present*) were used to calculate a score from 0-12. These message characteristics were message visuals (i.e. special effects, text graphics, slow motion), message audio (i.e. sound saturation, music, sound effects), and content (i.e. acted out, unexpected format).

In the second section of the codebook, the researchers identified the types of on-camera sources or characters in the videos. The characters were coded as citizens (no children referenced), mothers, fathers, female farmers, male farmers, scientists, doctors, chefs, governmental, and other (*0 = absent; 1 = present*). On-camera sources could be placed in multiple categories.

The final section of the codebook was to identify the values present in the narrated aspects of the videos. To develop this section of the codebook, the researchers used Schwartz Basic Human Values (2012) scale to categorize the narration. The researchers transcribed the audio of the videos and identified the presence (1) or absence (0) of the values in the narration. In addition to providing numerical descriptions of the values present in the campaign, the researchers used qualitative thematic analysis to categorize the values into their respective themes based on the words, phrases, and patterns. To provide accuracy and credibility of the

data, the two researchers analyzed the data independently, and used peer debriefing to compare notes and details to provide final themes (Glaser, 1965; Lincoln & Guba, 1990).

To establish reliability, two researchers coded 10 videos and compared results using Krippendorff's inter-coder reliability test. The researchers were in agreement 73.3% of the time (Krippendorff's $\alpha = .473$), and after discussion, the researchers came to agreement 96.7% of the time (Krippendorff's $\alpha = .929$). Quantitative data were analyzed using SPSS 22.0 and statistical procedures outlined by Field (2013).

Results

RO1: Describe the audio and visual message structure present in the campaign videos.

Message sensation value is the summation of 12 variables (Morgan et al., 2003). Table 2 lists the variables along with the number of times they were represented in the sample ($N = 10$).

Table 2.

Frequency of Message Sensation Value Variables in "Nothing to Fear Here" Campaign Videos (N=10)

Message Sensation Value Variable	<i>F</i>	%
Number of Cuts		
0-4	0	0
5-14	0	0
15 or more	10	10
Visual		
Slow Motion	4	40
Special Visual Effects	1	10
Text Graphics	1	10
Unusual Color	0	0
Intense Images	0	0
Audio		
Sound Saturation	10	100
Music	10	100
Sound Effects	0	0
Content		
Acted out (vs. Talking Head)	10	100
Unexpected Format	0	0
Surprise Twist or Ending	0	0

The level of message sensation value was slightly above average ($M = 5.60$, $SD = .70$).

The highest message sensation value was 7 ($n = 1$), and the lowest message sensation value was 5 ($n = 5$). Table 3 provides the frequency of the videos message sensation values.

Table 3.

Message Sensation Values of “Nothing to Fear Here” Campaign Videos ($N = 10$)

MSV	<i>f</i>	%
7	1	10
5	5	50
4	4	40

RO2: Describe the type of on-camera sources and characters used in the campaign.

The most predominant on-camera sources in the campaign were female farmers and ranchers ($n = 10$) and mothers ($n = 10$). Children were also present in seven of the videos. Additionally, male farmers/ranchers were present in five of the videos, and fathers were present in four of the videos. The “other” category was used to describe on-camera sources that were not listed in the coding scheme, which were grocery store workers ($n = 1$) and teachers ($n = 1$). Table 4 displays the frequency and percentage of the types of on-camera sources present in each of the videos.

Table 4.

On-Camera Sources Present in the “Nothing to Fear Here” Campaign Videos ($N = 10$)

Sources	<i>f</i>	%
Female Farmer/Rancher	10	100
Mothers	10	100
Children	7	70
Male Farmer/Rancher	5	50
Fathers	4	40
Citizens (No Reference to Children)	3	30
Other	2	20

Note: Totals will not equal 100%

RO3: Identify the values presented in the campaign.

To categorize the type of values present in the “Nothing to Fear Here “ campaign, the researchers used Schwartz (2012) Theory of Basic Human values. Table 5 displays frequencies

and percentages of the values present in the videos. The following section also provides examples of each of the values present in the campaign.

Table 5.
Basic Human Values (Schwartz, 2012) Present in the “Nothing to Fear Here” Campaign Videos (N = 10)

Value	<i>f</i>	%
Benevolence	10	100
Security	9	90
Self Direction	5	50
Universalism	3	30
Hedonism	1	10
Stimulation	0	0
Achievement	0	0
Conformity	0	0
Tradition	0	0
Power	0	0

Note: Totals will not equal 100%

Benevolence. The value of benevolence, or the desire to enhance the welfare of those around an individual, was present in all the videos ($n = 10$). Benevolence was described when discussing the welfare of livestock sent to slaughter: “The thing I want consumers to understand is even though I am raising these animals for meat, I still care deeply for them.” The act of caring for the land was observed in statements about agricultural sustainability: “This is our job, this is our livelihood and we want to make sure we are doing the best that we can.” Discussion of the use of antibiotics was also reflected using the value of benevolence: “We use antibiotics very judiciously. By using antibiotics and preventing animal suffering, I am able to be really compassionate toward that animal.”

Further, the value of benevolence was observed when mothers were comparing the welfare of their children to welfare of animals. For example, in statements about animal welfare, the narrators compared their children’s welfare to that of their animals: “As much as I care about how my children are raised, I care about how our cattle are cared for and so the standards that we

follow in the care of those cattle is top priority for us.” Benevolence was also observed when the topic of genetically modified soybeans was discussed:

I have grown up on the farm my whole life, and I have eaten the soybeans right out the field – before they were GMOs and after they were GMOs. Now, my kids eat the soybeans right out of the field. I don’t feel any worry about that at all. I would never intentionally feed my family anything that would be unsafe.”

Security. The value of security was present in nearly all the videos ($n = 9$). For example, food security was reflected in discussions pertaining to animal antibiotics: “We will always have veterinarian supervision in how we use antibiotics on our farm and that’s really important to us... We are trying to provide the safest, healthiest food possible for our children.” Security was also reflected in the video about dairy management:

I know as a business owner, I want to be really careful about whatever I am introducing into my herd. I want to make sure that they are really well taken care of so I am not going to put anything in there that is not healthy for the cow.

The farmers expressed confidence that their food was safe for consumers:

I absolutely feel confident that the food that we produce on our farm is safe and the reality is, the food that leaves our gate probably ends up on our plate, as well. As a wheat producer or as a cattle producer, we want to make sure that we are providing those consumers with the best possible product.

Self-Direction. The value of independent thought or action to choose something different than the norm, or self-direction, was present in five of the videos in the campaign. Exploring different options for sustainable farming was described:

The goal of sustainability on our farm is to farm indefinitely. Every year, we work to be a little bit better at being good stewards of the land. We work to be better at growing good crops and healthy and safe livestock.

The idea of creativity and exploring different option was valued as self-direction in one video:

We grow both GMO and non-GMO soybeans on our farm, and one year, we decided to look and compare the two fields on chemicals for herbicides. That particular year, we used about 1/3 of the chemicals on the GMO as we did on the non-GMO.

Universalism. Universalism is the value of maintaining welfare for all people, animals, and nature, and it was present in three of the videos. The value was found in discussions of keeping people healthy: “Our farm philosophy is healthy cows, healthy people, healthy planet.” Universalism was also evident when sources discussed how farming could impact the environment: “We have a lot to learn, but we know as farmers we have an impact on the environment and it’s our responsibility to take care of that.”

Hedonism. Hedonism, present in one video about family ownership, demonstrates the fulfillment and gratification of farm ownership: “I started becoming a farmer [when I married my husband], and I have never been more passionate about something in my entire life.”

Conclusions and Discussion

Although the majority of the United States population is disconnected from agriculture, this public is still responsible for policy and market related decisions, and they need to be aware of and informed about the processes that occur in the agricultural industry (Doerfert, 2011). To make information relevant to consumers, researchers recommend value congruent messages should be developed to promote the agricultural industry (Krause et al., 2015; Center for Food Integrity, 2014). Value congruent messages have the unique ability to provide scientific content, while also appealing to aspects of the consumer’s social, cultural, and personal beliefs. This descriptive study sought to analyze videos from the “Nothing to Fear Here” agricultural communications campaign to describe the message’s structure and use of value congruent terminology. This study was limited to one agricultural communications campaign so generalizations should be made with caution.

The videos had a message sensation value scores between 5 and 7, which describes an above average level of message sensation (Krause et al., 2015). Each video had sound saturation

with voice over and natural sounds from the b-roll. According to Morgan et al. (2003), higher levels of message sensation value result in higher levels of emotional arousal. Prior research has connected emotional arousal, and message sensation value, to higher levels of information processing (Harrington et al., 2006). High message sensation value has also been connected to increased levels of social media engagement. Because social media is a community where organizations can make their messages readily available to consumers, these messages have the potential of not only attracting audience engagement, but also influencing their attitude (Jenkins et al., 2013). The more engaged viewers become, the more likely the video will influence them (Susarla et al., 2012). If communicators are able to increase levels of emotional arousal, then receivers may have a higher level of information processing and engage more in the content.

The most predominant characters in the videos sampled were mothers and farmers — who were in all videos. Other characters were children and citizens. The use of these sources added credibility with viewers because they presented information consistent with ideas, such as sustainability, that consumers found favorable in an earlier study (Goodwin et al., 2011). Goodwin et al. (2011) found consumers favor messages targeting ideas of farmers being “stewards of the land” and working in “wide open green pastures.” The narration found in this analysis was consistent with those viewpoints. Further, Hughner et al. (2007) explained how parents, specifically of younger children, are most likely to be concerned with the origin of their food. Because of the narration being congruent with consumer values and the type of characters used, researchers concluded video producers were attempting to use the visual media to be congruent with family values.

Communication practitioners can also frame messages to ensure they appeal to the values of the target audience (Center for Food Integrity, 2015; Krause et al., 2015). Every individual has

numerous values of varying degrees of importance per individual (Schwartz, 2012). Values provide an avenue for communicators to reference cultures, social beliefs and personal beliefs of the target audience. The dominant values in these videos were benevolence, security, self-direction, universalism, and hedonism.

Language such as “I feed my kid this, too” was reflective of the benevolence value. Benevolence and security were the most predominately used values in the video campaign. The findings from this study suggest the videos were created that contain messages congruent with the consumer values.

Prior research suggests understanding levels of message sensation value and the types of values present may increase the level of information processing that occurs when a receiver views a message (Harrington et al., 2006; von Borgstede, 2014). The more engaged individuals become with the video, the more likely the video will influence their behavior or attitude (Susarla et al., 2012; Petty & Cacioppo, 1986). Because these videos were aimed at influencing those outside of production agriculture, it is crucial video producers engage the audience on a deeper level using both values and emotional arousal in their messaging.

Recommendations

This study a framework to develop messages that appeal to both emotions and values of the target audience. According to the prior literature, agricultural communicators must target their messages so they resonate with an audience who is disconnected from agriculture. Additionally, communication practitioners should consider the characters present in their videos as it also plays a vital role in reaching their audience. Additionally, research from the Center for Integrity (2015) identified consumers resonate with people who are similar to them. Therefore, when targeting moms, researchers should use female farmers and mothers as the main characters

in their messages. Value congruent messages that address values such as benevolence and security would also be helpful, although these are not the only values that might need to be included in messaging.

This study described the video structure, content, and values present in one agricultural advocacy campaign. There is a need to evaluate similar types of video campaigns to determine how effectively they are integrating value congruent messages. Video messaging has the potential to promote trust and transparency in the agriculture industry.

For future research, it would be interesting to understand the role of message sensation value and measure emotional arousal levels via psychophysiology, or biometric measurement. Because relationships between value congruent messages and message sensation value have been connected to higher levels of information processing, researchers should seek ways to understand the role of these variables in information processing. Further research should identify how the level of emotion or the type of values contained in a video relates to social media engagement. On a broader level more studies should research how to most effectively influence the public about the agricultural sciences.

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