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Journal of Applied Communications

The Journal of Applied Communications

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ACE develops professional skills of its members to extend knowledge about agriculture, natural resources, and life and human sciences to people worldwide.

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Research

Journal of
Applied Communications

Identifying Agriculturists' Online Communication Tool Training Needs

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Abstract

Online communication tools, specifically social media, have provided new ways for agriculturists to promote and advocate for agriculture. Although agricultural producers find value in using social media to communicate about agriculture, many are not comfortable using these tools. The purpose of this study was to identify and prioritize training needs of agriculturists regarding use of various online communication tools. The USDA's Beginning Farmers and Ranchers Development Program provided funding to develop workshops that would help agriculturists learn to use online communication tools effectively. Members of seven agricultural organizations in three states were sent a link to an online questionnaire, and 185 completed responses were analyzed for this study. Across all tasks, the highest means for perceived importance dealt with website tasks while Twitter and blogging tasks had the lowest means for perceived importance. Many of the tasks respondents were most competent completing were the beginning steps and they were least competent completing more complex uses of social media. Using the Borich needs assessment model, respondents indicated a greater need for training on topics related to websites, other online communication tasks, and Facebook. These results were used to develop a daylong online communications training workshop in each of the states.

Key Words
Social media, online communication, needs assessment, farmers, ranchers

Introduction/Literature Review
The advent of online technology provides unprecedented opportunities for those in agriculture to communicate with many different publics in new ways (Irani, 2000). Grassroots environmental organizations have reported being better able to spread information to voters and supporters through Internet channels (Kutner, 2000), while home horticulturists have indicated they use online resources for gardening tips and information (Ellis, Gordon, & Johnson, 2012). Social media sites, in particular, have the ability to serve as a forum for personalized and targeted communications as well as reach large audiences quickly (Anderson-Wilk, 2009). Social media sites are

> [W]eb-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. (Boyd & Ellison, 2007, p. 1)

Duggan and Smith (2014) found 73% of online adults now use some sort of social media tool and found 42% use multiple sites.

Some of the most popular social media tools currently include Facebook, Twitter, and blogs. Facebook has more than 1 billion monthly active users (Facebook, 2015), including near 870 million mobile users. Twitter has 302 million active users who log in at least once a month (Twitter, 2015). Blogs are websites maintained by a web user where posts may contain commentary, news, photos, videos, or other content (Kaye, 2010). The Nielsen Company (2012) reported there are more than 181 million blogs online, an increase from 36 million blogs identified in 2006. Social media use also accelerated due to smartphones, which facilitate access to social networking sites, without being tied to a wired Internet connection (Smith, 2009). The Pew Research Center (2014) reported 90% of all adult Americans own a cell phone and more than half (64%) own a smartphone.

In agriculture, Lohr (2011) said social media tools are a farming revolution in the same way the advent of radio was able to share market prices and weather information. Both can and have been used to make farming more profitable and depict agriculture in a positive manner. Through social media, farmers have the opportunity to interact, promote, and advocate for agriculture (Lohr, 2011). Agriculturists are able to share a realistic picture of agriculture with the public and create awareness for important issues (Meyers, Irlbeck, Graybill-Leonard, & Doerfert, 2011). Baumgarten (2012) said agribusinesses are using social media in revolutionary ways. Agricultural business owners have reported using Twitter to put a face with the farmer, encourage dialogue between agriculturists and those unfamiliar with agriculture, and connect members of the agricultural industry (Payn-Knoper, 2009). Agricultural commodity organizations are using blogs successfully to reach both traditional and new audiences (Moore, Meyers, Irlbeck, & Burris, 2013). Some agriculturists state social media will serve as "agriculture's newest survival tool" (Wisconsin State Farmer, 2011, para. 4). "With less than two percent of the U.S. population involved in farming, we have to take our stories directly to the consumer" (Lohr, 2011, para. 10).

Many agriculturists are not against participating in social media discussions, but they simply may not understand the benefits of using social media tools to promote or enhance business (Baumgarten, 2012). Although farmers may have access to the Internet through smartphones and other wireless-capable technology, many still are not realizing the full power social media can have on their business or agriculture as a whole (Graber, 2010). Agriculturists should broaden the scope of their social media efforts and begin to focus efforts externally to better communicate the message of agriculture to non-agriculture publics (Telg & Barnes, 2012). Graber (2010) found most agricultural producers see the importance of social media to communicate the message of agriculture, but many were uncomfortable using the technology or felt they did not have the time to contribute.

To help agriculturists more effectively utilize these online communication tools, the researchers organized social media training workshops through a grant from the USDA's Beginning Farmers and Ranchers Development Program. The free, daylong workshops were offered in three different states: Florida, Georgia, and Texas. The researchers targeted areas adjacent to metropolitan areas that had a known concentration of beginning or alternative farmers and ranchers. However, before the workshops were developed, it was necessary to conduct a needs assessment to determine how the importance of various online communication tasks and identify areas that deserved additional training. This article provides the results of that needs assessment.

Theoretical Framework
The theoretical framework for this study is Rogers' (2003) diffusion of innovations theory. According

to Rogers (2003), "diffusion is the process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). Innovations are ideas, practices, or objects seen as new by an individual (Rogers, 2003). Rogers identified five attributes of any innovation that help determine adoption rates: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage is the perception of how much more useful an innovation will be in comparison to its predecessor. Compatibility is how much an innovation agrees with current cultural and societal norms of a social system. The complexity of an innovation is the perception of the ease or difficulty required to master the innovation. Trialability refers to the ability of individuals to test-run an innovation before committing to adoption. The final perceived attribute is observability, which references whether the innovation can be observed in use by others in a social system (Rogers, 2003).

Consideration of these five characteristics is vital to explaining adoption patterns of any innovation. Other factors may influence the likelihood of technology adoption: the perceived ease of use (similar to complexity) and perceived usefulness (similar to relative advantage) (Rice, 2009) as well as people's attitudes toward the technology and their degree of innovativeness (Irani, 2000). Self-efficacy can also play a significant role in a users' technology-adoption attitudes (Yi & Venkatesh, 1996). Higher self-efficacy regarding technology use is positively related to the perceived ease of use, which influences an individual's intention to adopt the technology (Venkatesh, 2000). Agarwal, Sambamurthy, and Stair (2000) found a positive relationship between application-specific self-efficacy and ease of use that when users had higher self-efficacy regarding the specific application, they rated the system easier to use.

The diffusion of innovations theory has been cited in numerous studies regarding the adoption of emerging online media. The theory has been applied to identify who uses specific technologies (Peng & Mu, 2011) as well as why some users leave specific platforms in favor of others (Coursaris, Yun, & Sung, 2010). The adoption rate of social media is a topic of particular interest, especially among specific groups including university communicators (Kelleher & Sweetser, 2012), nonprofit organizations (Waters, 2010), online election campaigns (Gulati & Williams, 2011), and agricultural editors and broadcasters (Rhoades & Aue, 2010). These studies support the use of diffusion of innovations as a theoretical framework and demonstrate how the theory can be applied in a variety of settings. Rogers (2003) said a change agent can be used to influence the diffusion of an innovation through a social system. In the current study, diffusions of innovations is used as a theoretical framework to better understand where individuals who are serving as change agents should exert their efforts based on the feedback from those they intend to help.

Purpose & Research Questions

The purpose of this study was to understand the training needs of agriculturists in three states regarding the use of online communication tools. According to the American Association for Agricultural Education's 2011-2015 National Research Agenda (Doerfert, 2011) it is crucial to address the challenges and opportunities changing technologies present. These changing technologies include a wide variety of online communication tools such as social media, websites, and blogs.

To address the study's purpose, it was necessary to conduct a needs assessment, which is the process of identifying an area of need or weakness, then completing primary and secondary research to bridge gaps in areas of deficiency (Altschuld & Kumar, 2010). To develop training for agriculturists on how to utilize online communication tools, it was important to identify areas of need. Altschuld and Kumar (2010) define a need as "a measureable gap between two conditions – 'what is' (the cur-

rent status or state) and 'what should be' (the desired status or state)" (p. 3). The most beneficial pieces of needs assessment can be used to quickly impact short-term needs and those that can quickly be resolved as well as identify high-priority needs that may be more long-term to all those involved (Altschuld & Kumar, 2010). The following research objectives guided this investigation:

1. Determine respondents' perceptions of the importance of and their competence to complete identified online communication tasks.
2. Prioritize the online communication tasks, according to respondents, in need of additional training.

Methods

The design of this study was a quantitative, descriptive survey. Based on a USDA grant received to develop training materials for beginning farmers and ranchers in Florida, Georgia, and Texas, the population of this study included members of seven different organizations across these states that target either beginning or young farmers and ranchers. These organizations were purposively selected because their members represented agriculturists that the training resources were intended to reach.

The instrument, modified from an existing instrument to assess social media use and knowledge in college-aged students (Abrams & Baker, 2012), was distributed using Qualtrics online survey software. The survey consisted of four sections – current use of online communication tools, perceived importance and competence of completing identified online communication tasks, potential barriers and motivations for attending training regarding these online communication tools, and demographic questions. This article provides the results to the perceived importance and competence online communication tasks and demographics sections.

To determine the perceived importance and competence for completing various online communication tools, respondents were presented two to 10 frequently used tasks specific six social or online media tools – Facebook, Twitter, blogs, websites, "other online communication tasks," and "computer-based communications technology." Other online communication tasks dealt with using multiple social media tools and common tasks across tools such as uploading video and photos.

Respondents were asked first to indicate their perceived level of importance for each task in relation to his or her business or organization. For example, respondents were asked to "Please rate how you perceive the LEVELS OF IMPORTANCE for each of the following items." The following items could be: "Steps to create a Facebook page" and "Knowing what to post to Facebook." Each task's importance was indicated on a 5-point scale from 0 (no/none) to 4 (utmost/exceptional). After answering the importance questions for each tool, respondents were asked to rank their perceived level of competence for the same tasks on the same 5-point scale ranging from 0 (no/none) to 4 (utmost/exceptional). For example, respondents were asked to "Please rate your LEVEL OF COMPETENCE in response to the following items." They would then indicate their level of competence to complete the following items: "Steps to create a Facebook page" and "Knowing what to post to Facebook." Means and standard deviations were calculated to describe these responses.

To prioritize the training needs, researchers utilized Borich's (1980) needs assessment model. This approach to needs assessments collects more information than a Delphi study or Q-sort methodologies, which ask respondents to rank the importance of various topics. In the Borich needs assessment model, respondents indicate the importance of various tasks or competencies and indicate their ability to apply that knowledge or their competence related to those items. "Collecting this additional information increases the likelihood of planning inservice education programs which will be

of most importance" (Waters & Haskell, 1988, p. 27). The Borich needs assessment model has been used to identify the professional development needs of beginning agriculture teachers (Edwards & Briers, 1998; Garton & Chung, 1997), Extension professionals (Conklin, Hook, Kelbaugh, & Nieto, 2002), and college of agriculture faculty members (Rocca, 2010).

This model consists of a three-step process to analyze data. First, discrepancy scores were calculated for each individual for each task by subtracting the mean competence value from the mean importance value. This results in a set of "discrepancy scores." Second, a "weighted discrepancy score" was calculated for each individual by multiplying the discrepancy score by the overall mean importance rating for each task. Third, a "mean weighted discrepancy score" (MWDS) was calculated by using the sum of all weighted discrepancy scores and dividing by the number of respondents in the study. Essentially, if the participants rated one task as important, but they did not feel competent, then that task would rank high as an area in which to provide training; however, if the participants rated something as important but they felt competent, then the task would rank low as a training need. The MWDSs then were ranked from high to low to determine which areas warrant or require more training than others.

Before administering the instrument, it was evaluated by a panel of experts representing universities in each of the participating states to establish face and content validity. Survey distribution was conducted during a four-month period between July 2012 and October 2012. The lead research sent emails to organization representatives who then forwarded to the list of current members in their organizations. Potential participants first were sent an introductory email, then an email containing the survey link one week later. Two weeks after receiving the initial email, participants were sent a final reminder email, also containing a link to the survey. Qualtrics survey software stored all responses and then data was transferred into Microsoft Excel and SPSS® Version 20.0 for Windows.

The use of non-probability sampling is a limitation of the study. Due to this, the results cannot be generalized beyond this study's sample. This study is also limited in the inability to calculate a response rate because researchers were not given access to member contact information (or provided with the total number on each email list). However, the instrument did have a 64.7% completion rate; of the 286 respondents who started the questionnaire, 185 provided instruments complete enough to be analyzed for the study.

Results

A slight majority of respondents were males (n = 100, 54.1%). The mean age of respondents was 39 years (SD = 13.74), but respondents' ages ranged from 18 to 90 years old. The two most frequently selected types of agricultural operations were cattle production (n = 78, 42.2%) and grain and oilseed farming (n = 76, 41.1%). The least frequently indicated type of agricultural operations were horticulture (n = 10, 5.4%) and dairy cattle and milk production (n = 8, 4.3%). The majority of respondents (n = 112, 66.7%) selected more than one operation type while the remaining 56 respondents (33.3%) identified only one. Seventy-seven respondents (41.6%) said they engaged in some type of direct-to-consumer marketing; a greater number (n = 92, 49.7%) indicated they did not. Respondents owned a variety of electronic devices that had Internet access, such as laptops (n = 154, 83.2%), smartphones (n = 120, 64.9%), desktop computers (n = 104, 56.2%), and tablets (n = 55, 29.7%). The majority of respondents (n = 145, 85.9%) owned more than one of these tools.

Research Objective 1. Determine respondents' perceptions of the importance of and their competence to complete identified online communication tasks.

Facebook

Mean scores for importance and competency of Facebook tasks are displayed in Table 1. The highest importance mean belonged to the task "Understanding the purpose for my Agricultural Business" (M = 2.48, SD = 1.28). The lowest task was "Steps to Create a Facebook Page" (M = 1.92, SD = 1.14). The highest competency mean belonged to the task "Understanding the purpose for my Agricultural Business" (M = 2.34, SD = 1.19). The lowest mean for competency was "Generating Page 'Likes'" (M = 1.65, SD = 1.21). Table 1 also displays the mean weighted discrepancy scores calculated for each Facebook-related task.

Table 1

Respondents' Perceptions of the Importance of Facebook Tasks and Perceived Competence Performing the Tasks

Facebook Tasks	Importance		Competence		
	M	SD	M	SD	MWDS[a]
Engaging people/consumers	2.31	1.32	1.78	1.15	1.11
Awareness of the risk in having a business presence and how to mitigate them	2.25	1.22	1.72	1.19	1.06
Measuring impact or effectiveness for my agricultural business	2.17	1.21	1.67	1.16	0.95
Knowing what I should post to Facebook	2.33	1.28	1.90	1.22	0.85
Using one effectively for my agricultural business	2.15	1.27	1.72	1.19	0.81
Generating Page Likes	2.05	1.25	1.65	1.21	0.72
Creating an effective Facebook Page	2.12	1.23	1.85	1.28	0.49
Understanding the purpose for my Agricultural Business	2.48	1.28	2.34	1.19	0.42
Steps to create a Facebook Page	1.92	1.14	2.04	1.31	-0.22

Note. Attitudes were evaluated on a five-point scale where 0 = *no/none* and 4 = *utmost/exceptional*.
[a]MWDS: Mean Weighted Discrepancy Score.

Twitter

Results for attitudes toward the importance of Twitter for an agricultural business or organization are indicated in Table 2. The highest importance mean response was for "Understanding the purpose for my agricultural business" (M = 1.41, SD = 1.47), while the lowest mean was "Steps to create a Twitter page" (M = 1.04, SD = 1.24). Though below the mid-point on the scale, the highest competency mean was for "Understanding the purpose for my agricultural business" (M = 1.05, SD = 1.25). The lowest competency mean was tied between "Generating followers" (M = 0.74, SD = 1.04) and "Measuring impact or effectiveness for my agricultural business" (M = 0.74, SD = 1.09). Mean weighted discrepancy scores were then calculated for each Twitter-related task (see Table 2).

Table 2

Respondents' Perceptions of the Importance of Twitter Tasks and Perceived Competence Performing the Tasks

Twitter Tasks	Importance		Competence		MWDS[a]
	M	*SD*	*M*	*SD*	
Awareness of the risk in having a Twitter presence and how to mitigate them	1.25	1.38	0.78	1.10	0.49
Knowing what I should post to Twitter	1.24	1.40	0.77	1.08	0.48
Generating followers	1.21	1.37	0.74	1.04	0.48
Engaging people/consumers	1.25	1.40	0.78	1.11	0.47
Measuring impact or effectiveness for my agricultural business	1.19	1.33	0.74	1.09	0.46
Using one effectively for my agricultural business	1.21	1.33	0.77	1.07	0.45
Understanding the purpose for my Agricultural Business	1.41	1.47	1.05	1.25	0.42
Creating an effective Twitter page	1.16	1.34	0.78	1.11	0.38
Steps to create a Twitter page	1.04	1.24	0.84	1.19	0.18

Note. Attitudes were evaluated on a five-point scale where 0 = *no/none* and 4 = *utmost/exceptional*.
[a]MWDS: Mean Weighted Discrepancy Score.

Blogs

Respondents' perceived importance, competency, and mean weighted discrepancy scores of blog-related tasks are provided in Table 3. The blogging task with the highest mean was "Understanding the purpose for my Agricultural Business" (*M* = 2.06, *SD* = 1.35), and was also the only mean above the mid-point of the scale. The task with the lowest importance mean was "Steps to create a blog" (*M* = 1.70, *SD* = 0.93). Although all competency value means fell below the scale's mid-point, the task with the highest competency mean was "Understanding the purpose for my Agricultural Business" (*M* = 1.68, *SD* = 1.28). The lowest blogging task competency mean was "Generating subscribers" (*M* = 1.13, *SD* = 1.12). Mean weighted discrepancy scores were also calculated for each website-related task (see Table 3).

Table 3

Respondents' Perceptions of the Importance of Blogging Tasks and Perceived Competence Performing the Tasks

Blogging Tasks	Importance		Competence		MWDS[a]
	M	*SD*	*M*	*SD*	
Engaging people/consumers	1.79	1.34	1.17	1.11	0.95
Generating subscribers	1.76	1.35	1.13	1.12	0.92
Measuring impact or effectiveness for my agricultural business	1.76	1.31	1.16	1.11	0.88
Using it effectively for my agricultural business	1.82	1.32	1.24	1.20	0.86
Creating an effective blog page	1.78	1.33	1.22	1.19	0.84
Awareness of the risk in having a blog and how to mitigate it	1.76	1.36	1.23	1.20	0.79
Knowing what I should post to the blog	1.82	1.35	1.33	1.19	0.75
Steps to input multimedia into a blog post	1.72	1.29	1.27	1.23	0.64
Steps to create a blog	1.70	1.27	1.24	1.20	0.65
Understanding the purpose for my Agricultural Business	2.06	1.35	1.68	1.28	0.62

Note. Attitudes were evaluated on a five-point scale where 0 = *no/none* and 4 = *utmost/exceptional*.
[a]MWDS: Mean Weighted Discrepancy Score.

Websites

Respondents were asked to identify their perceptions of importance and competency of several website tasks. Results for this set of tasks are displayed in Table 4. The website task with the highest importance mean was "Using a website effectively for my agricultural business" (M = 2.59, SD = 1.32), followed closely by "Creating a website with user-friendly templates and publishing options" (M = 2.57, SD = 1.31). The provided website task with the lowest importance mean was "Publishing or updating your own Web page/site" (M = 0.72, SD = 1.23). The competency means for all website-related tasks fell below the scale's mid-point. The task with the highest mean was "Using a website effectively for my agricultural business" (M = 1.56, SD = 1.22). The task with the lowest mean was "Publishing or updating your own Web page/site" (M = 1.41, SD = 1.21). Mean weighted discrepancy scores were also calculated for each website-related task (see Table 4).

Table 4

Respondents' Perceptions of the Importance of Website Tasks and Perceived Competence Performing the Tasks

Website Tasks	Importance		Competence		MWDS[a]
	M	SD	*M*	*SD*	
Creating a website with user-friendly templates and publishing options	2.57	1.31	1.45	1.19	2.64
Using a website effectively for my agricultural business	2.59	1.32	1.56	1.22	2.42
Measuring impact or effectiveness of website for business	2.48	1.30	1.43	1.19	2.35
Publishing or updating your own Web page/site	2.45	1.32	1.41	1.21	2.35
Understanding how to manage a website efficiently	2.47	1.33	1.45	1.24	2.30

Note. Attitudes were evaluated on a five-point scale where 0 = *no/none* and 4 = *utmost/exceptional*.
[a]MWDS: Mean Weighted Discrepancy Score.

Other Online Communication Tasks

The next section on the instrument asked respondents to rate the perceived importance and competence of a variety of other online communication tasks. As Table 5 displays, the task with the highest importance mean was "Understanding how social media (in general) fits into the business strategy for my agricultural operation" (*M* = 2.31, *SD* = 1.22). The task with the lowest importance mean was "Using a social media management tool" (*M* = 1.54, *SD* = 1.19). The other online communication task with the highest competency mean was "Understanding how social media (in general) fits into the business strategy for my agricultural operation" (*M* = 1.73, *SD* = 1.19). The task with the lowest mean was "Using a social media management tool" (*M* = 1.00, *SD* = 1.12). All reported means for this set of competencies were below the scale's mid-point. Table 5 also provides the mean weighted discrepancy scores for each of these communication tool-related tasks.

Table 5

Respondents' Perceptions of the Importance of Other Online Communication Tool–Related Tasks and Perceived Competence Performing the Tasks

Other Online Communication Tools Tasks	Importance		Competence		
	M	SD	*M*	*SD*	MWDS[a]
Using social media to gather information about audiences/consumers as it relates to your business	2.09	1.25	1.27	1.14	1.56
Understanding how to manage social media effectively	2.12	1.27	1.38	1.19	1.43
Using social media to monitor consumer trends as they relate to my business	2.02	1.22	1.25	1.12	1.42
Understanding how social media (in general) fits into the business strategy for my agricultural operation	2.31	1.22	1.73	1.19	1.30
Understanding how I can utilize multiple people in my operation to help with my social media presence (family members and employees)	2.13	1.27	1.46	1.20	1.29
Using social media measurement tools	1.93	1.23	1.19	1.16	1.24
Uploading videos to the web for the purpose of sharing	2.10	1.22	1.48	1.20	1.16
Uploading photos to the web for the purpose of sharing	2.19	1.23	1.66	1.23	1.00
Using a social media management tool	1.54	1.19	1.00	1.12	0.73

Note. Attitudes were evaluated on a five-point scale where 0 = *no/none* and 4 = *utmost/exceptional*.
[a]MWDS: Mean Weighted Discrepancy Score.

Computer-based Communication Technology

Finally, respondents were asked to indicate perceived importance and competency for two general computer-based communication technology tasks. The higher importance mean for the set was "Using computer-based communication technology" (M = 3.00, SD = 0.90) compared to "Teaching myself new computer-based communications technology" (M = 2.83, SD = 1.00). "Using computer-based communication technology" had a competence mean of 2.37 (SD = 0.94) compared to the other item's mean of 2.27 (SD = .98). The mean weighted discrepancy score for the "Using computer-based communication technology" was 1.69. "Teaching myself new computer-based communications technology" had a mean weighted discrepancy score of 0.00.

Research Objective 2: Prioritize the online communication tasks, according to respondents, in need of additional training.

Using the Borich needs assessment model, mean weighted discrepancy scores were calculated for tasks. Table 6 provides the tasks (ranked in descending order) that had mean weighted discrepancy

scores more than 1.0, indicating more need for additional training. The top five ranked tasks were all website tasks.

In addition to rating the importance and competence of specific online communication tasks, respondents provided their level of interest in learning how to use low cost or free online communications technology to improve your agribusiness. This question was asked on a four-point scale ranging from 0 (*uninterested*) to 3 (*very interested*). The overall mean response for this item was 1.97 (*n* = 169, *SD* = 0.89), indicating that participants were somewhat interested.

Table 6

Online Communication Tool Training Needs of Agriculturists Using the Borich Needs Assessment Model

Rank	Construct	MWDS[a]
1	Website – Creating a website with user-friendly templates and publishing options	2.64
2	Website – Using a website effectively for my agricultural business	2.42
3	Website – Measuring impact or effectiveness of website for business	2.35
4	Website – Publishing or updating your own Web page/site	2.35
5	Website - Understanding how to manage a website efficiently	2.30
6	Computer-Based Communication – Using computer-based communication technology	1.69
7	Other Online Communication Tools – Using social media to gather information about audiences/consumers as it relates to your business	1.56
8	Other Online Communication Tools – Understanding how to manage social media effectively	1.43
9	Other Online Communication Tools – Using social media to monitor consumer trends as they relate to my business	1.42
10	Other Online Communication Tools – Understanding how social media (in general) fits into the business strategy for my agricultural operation	1.30
11	Other Online Communication Tools – Understanding how I can utilize multiple people in my operation to help with my social media presence (family members and employees)	1.29
12	Other Online Communication Tools – Using social media measurement tools (Google Analytics, Facebook Insights, etc.)	1.24
13	Other Online Communication Tools – Uploading videos to the web for the purpose of sharing	1.16
14	Facebook – Engaging people/consumers	1.11
15	Facebook – Awareness of the risk in having a business presence and how to mitigate them	1.06
16	Other Online Communication Tools – Uploading photos to the web for the purpose of sharing (using Facebook, Twitter, Flickr, etc.)	1.00

[a]MWDS: Mean Weighted Discrepancy Score.

Conclusions & Implications

Many people have encouraged agriculturists to adopt emerging online communications tools to promote their businesses (Baumgarten, 2012) and share agriculture's story with a larger audience (Telg

& Barnes, 2012). To develop training opportunities and resources to help agriculturists adopt these online communication tools, it is important to identify what topics require or deserve the most attention. This study used the Borich (1980) needs assessment model to identify these needs in a sample of agriculturists in three states.

The diffusion of innovations theory (Rogers, 2003) provides a robust framework through which to understand how technologies may spread (or not) through a social system (Rice, 2009). Consideration of the innovation characteristics of various technologies helps explain the likelihood of adoption or non-adoption. The respondents' rating of the importance of various communication tasks provides insight into how they viewed different online communication tools and were used in planning online media training workshops for beginning farmers and ranchers. Irani (2000) said a person's attitude toward the technology may influence a technology users' decision to adopt. According to Rogers (2003), an innovation's attribute of relative advantage is how "an innovation is perceived as better than the idea it supersedes" (p. 15). Within each tool, the highest perceived importance mean typically dealt with understanding the purpose of the tool or using it effectively. Across all tasks, the highest means for importance dealt with website tasks. The lowest importance means typically dealt with the "getting started" item of creating an account. This may not have been ranked as high in importance because these are beginning level items and can typically be completed quickly before needing to address more time-intensive items such as engaging the audience and knowing what to post. The importance means for Twitter and blogging tasks were all below the mid-point on the scale. Although Twitter and blogs have been found to be useful in agriculture (Moore et al., 2013; Payn-Knoper, 2009), these items were not very important to respondents in this study.

An individual's perceived competence to complete a task is closely related to self-efficacy, which can influence a technology users' adoption (Venkatesh, 2000; Yi & Venkatesh, 1996). An individual's competence rating provides their perception of the ease or difficulty required to master the technology, which is the innovation characteristic of complexity (Rogers, 2003). In many instances, what was rated as the most important task within each tool was also where respondents were most competent. This may indicate they had already made the effort to learn the tasks they viewed as the most important. Many of the tasks respondents were most competent completing were the beginning steps such as creating a page on Facebook or Twitter. These are introductory level tasks that must be done to begin using a tool so it is logical the respondents would feel competent in these areas. This higher rating of competence for these items may also explain why respondents did not view them as high in importance – they had already moved past this step and were focused on different tasks. Respondents indicated the lowest competence means for more complex uses of social media such as engaging followers and measuring the impact. These tasks require more planning and active experimentation, which respondents may not have had time to complete.

Utilizing Borich's (1980) model for needs assessment, respondents indicated they have a greater need for training for 16 of the 44 online communication tasks included on the instrument. Of these 16 tasks, the top five were related to the use of a website, eight were classified under "other communication tools," two involved use of Facebook, and one was about the general use of computer-based communication. These tools and tasks are what the respondents deemed most desirable to address in future trainings.

Recommendations

This study provided practical recommendations that were implemented in the design of workshops for beginning farmers and ranchers that took into account differences in gender, age, experience

level, and operation type to best serve the diverse audience. Based upon the Borich (1980) needs assessment values, the researchers created the following workshop agenda: Social Media Planning and Engagement (1 hour and 15 minutes); Facebook for Business Marketing (1 hour); Websites and Blogs (1 hour and 15 minutes); Using Twitter to Promote an Agricultural Business (45 minutes); and Measuring Social Media Success (45 minutes). Because many agricultural businesses use a blog as a website and the respondents of the questionnaire placed so much importance on websites, the team dedicated a significant portion of the workshop to the topic. This included creating a blog, aesthetics, content, and other best practices.

Additional training opportunities should focus on tasks related to website creation and management. These tasks were rated as the most important, but respondents' demonstrated a shared need for more training in this area, and thus workshops focusing on these needs will be offered. With this much importance placed upon websites, and after one round of daylong training workshops were offered, the researchers separated website development, management, and assessment into its own workshop offered in addition to a workshop that focused specifically on social media. There was also a need for training regarding more abstract conventions including the purpose of using online communication tools and how to manage them effectively. Less time should be spent training attendees on tools such as Facebook, which many respondents rated themselves as competent using, and Twitter, which respondents indicated was not useful for their businesses. If training in these social media tools is requested, it is best to ask participants to complete some of the basic steps (such as creating accounts) before they attend the workshop so more time can be dedicated to more complex tasks.

Although this study does provide insight into what agriculturists' online communication training needs are, the results cannot be generalized beyond this study's sample. As such, additional inquiries should be made in other states with a randomized sample of agriculturists to allow for generalization. Online communication tools are continually being updated or introduced so additional research needs to be conducted to further explore how individuals and groups in agriculture are adopting these innovations.

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Loss Aversion and Regulatory Focus Effects in the Absence of Numbers: Qualitatively Framing Equivalent Messages on Food Labels

Katie M. Abrams

Abstract

Examining effects of qualitatively framing information as nonloss and gain is important because not all messages can be communicated quantitatively to consumers. This is especially the case with many food labels addressing farming methods. Research on loss aversion cognitive bias has shown people react more strongly to messages framed negatively (loss/nonloss) than equivalent information framed positively (nongain/gain). A few studies, however, have shown an opposite reaction when comparing equivalent nonloss– to gain-framed information and offered regulatory focus theory as an explanation. Most studies have relied on quantitative descriptors to frame information as gains or nonlosses, but are the cognitive biases explained by loss aversion or regulatory focus still powerful using qualitatively framed information? The purpose of this study was to compare effects of qualitatively framed gain and nonloss messages within food labels on people's attitudes. Six-hundred-sixty subjects were assigned randomly to one of two treatment groups: nonloss– or gain-framed information about environmental impact and animal welfare on a package of chicken or a control group. Results showed no difference between the frames in the effect on subjects' attitudes toward the product. Marketers and others crafting persuasive messages who attempt to use nonloss or gain framing of information to appeal to consumers' cognitive biases may be compromising their efforts without using numbers or quantifiable information.

Key Words

Framing effects, food labels, cognitive biases, loss aversion, regulatory focus

Introduction

People will arrive at different decisions depending on how choices are framed. Framing, at a basic level, refers to the process through which individuals or groups make sense of their environment — frames are cultural structures that organize understanding of social phenomena. "Packets of incoming information pass through various cognitive, affective, and/or social filters to produce a 'perception' of the outside world. This construction of reality then drives judgment and decision-making and ultimately behavior" (Boettcher, 2004, p. 332-333). Although this may be an internal process, it is often constructed by some external actor — either deliberately or unintentionally (Boettcher, 2004).

The psychology literature's definition of a framing effect is when two "logically equivalent (but not transparently equivalent) statements of a problem lead decision makers to choose different options" (Rabin, 1998, p. 36; Tversky & Kahneman, 1981). This manipulation of information is called equivalency framing. The terminology used in the literature to describe these frames is loss (referring

This paper was presented at the Association for Education in Journalism and Mass Communication, Communication Theory and Methodology Division.

to losing something or taking something away), nonloss (referring to avoiding the loss of something), gain (achieving or gaining something), and nongain (not achieving or gaining something). Levin and Gaeth (1988) offer a good example of equivalency framing. They found variation in quality preferences regarding beef depending on whether a beef product was labeled as being 75% lean (gain frame) or 25% fat (loss frame). The ground beef was evaluated by subjects as better tasting and less greasy when it was labeled in the positive light (75%) lean. The common adage of pessimists see the glass half empty and optimists see it half full also demonstrates the same object can be viewed in two different ways. Objectively, a glass half empty is a glass half full, but people may make different decisions about that object depending on how it is presented to them. One of the key findings from research in the area of equivalency framing effects is people will react more strongly to the idea that the glass is half empty than half full because humans are more averse to the notion of losing something.

A few studies, however, have shown an opposite reaction when comparing equivalent nonloss- to gain-framed information and offered regulatory focus theory as an explanation. Furthermore, most studies have relied on quantitative descriptors to frame information as gains or nonlosses, meaning they use numerical information (e.g., 75% lean meat vs. 25% fat). However, not all messages can be communicated quantitatively, so are the cognitive biases explained by loss aversion or regulatory focus still powerful when numbers are not used in the framing of the information, in essence, when information is qualitatively framed as being a nonloss or gain? For example, a food product with labeling claims framed as avoiding loss or damage to the environment (nonloss) may or may not garner a different consumer response in comparison to claims framed as achieving gains or repairing the environment (gain). Food labels addressing farming methods, such as animal production techniques (e.g., free range, humanely raised) or "no genetically modified organisms," are an ideal case-in-point to examine since quantifying farming methods' effects are not only debated (Broom, 1991; Stolze, Piorr, Häring, & Dabbert, 2000) but also are difficult for consumers to understand (Bateman, Dent, Peters, & Glitsch, 2007). This study compared the persuasive effects of qualitatively framed gain and nonloss messages contained within food labels addressing farming methods.

Equivalent Gains and Nonlosses: Loss Aversion and Regulatory Focus

The attempt to explain and predict how people will react to different frames of information is explained by both the principle of loss aversion and regulatory focus theory. "Loss aversion is perhaps the most successful and widely used explanatory construct in behavioral decision research" (Brenner, Rottenstreich, Sood, & Bilgin, 2007, p. 369). As one of the main components of Kahneman and Tversky's (1979, 1981) prospect theory, it shows losses have a steeper value function than gains. The concept of loss aversion does not necessarily imply people pay more attention to losses over gains, rather, the reaction to a loss is stronger than a gain (Brenner et al., 2007).

> Although seemingly irrational in the context of business and market transactions, it has roots in lower-level psychological laws that seem adaptive to basic environmental demands. Thus, the asymmetry of people's reactions to pain versus pleasure is eminently sensible in a world that punishes those who ignore danger signs more than it rewards those who pursue signs of pleasure. (Newell, Lagnado, & Shanks, 2007, p. 119)

Many studies have found support for loss aversion (for example, Gamliel, 2010; see Levin, Schneider, & Gaeth, 1998, for a review). One of the more recent studies testing loss aversion, however, found a greater hedonic reaction to losses than to non-gains (supportive of loss aversion) but a greater hedonic reaction to gains than non-losses (not supportive of loss aversion) (Liberman, Idson, & Higgins, 2005). The figure used to depict prospect theory and loss aversion in the study includes

a depiction of nongains and nonlosses (see Figure 1), which makes the conflicting finding regarding the stronger reaction to gains than nonlosses more visible. Similar findings were presented in Idson, Liberman, and Higgins (2000) and Idson, Liberman, and Higgins (2004). All three studies offered regulatory focus theory as a possible explanation for the findings.
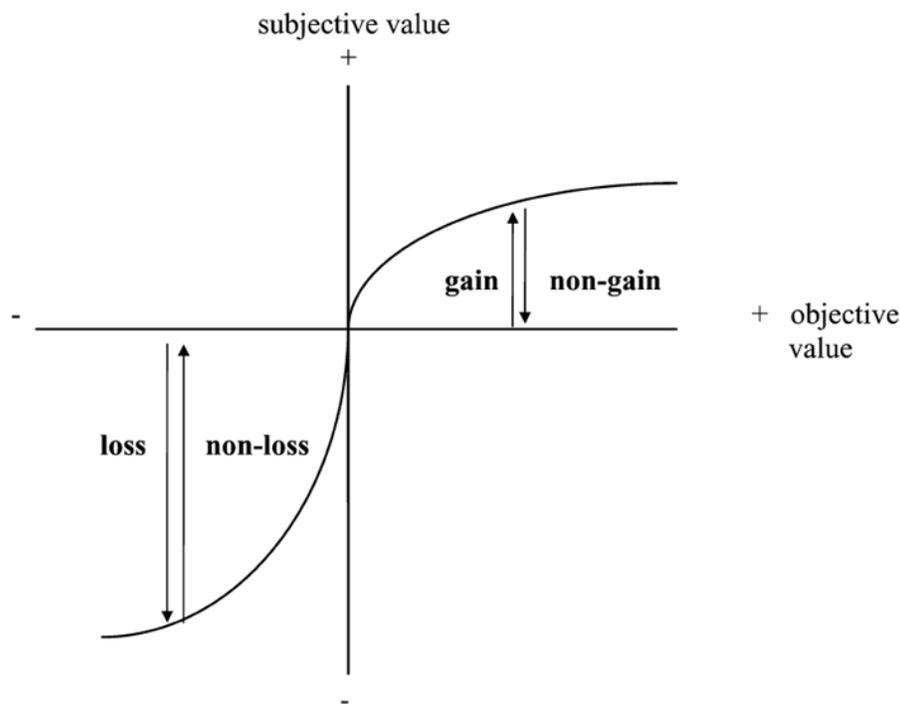

Figure 1. Subjective value function under prospect theory with reference to gains/non-gains and losses/non-losses. Shows loss-framed information garners a stronger subjective reaction than equivalent gain-framed information. Obtained from Liberman et al. (2005).

Regulatory focus theory adds to the concept of loss aversion by proposing a cognitive mechanism (regulatory focus) that regulates how people attend to gain, nongain, loss, and nonloss messages. Those with a prevention focus will regulate their behaviors away from negative outcomes (losses/nonlosses), while those with a promotion focus will regulate their behaviors toward positive outcomes (gains/nongains) (Higgins, 1998). Regulatory focus can be primed, but it is also a cognitive style (referred to as chronic regulatory focus). The theory also offers a rationale for why gain-framed information should garner a stronger reaction than equivalent nonloss-framed information, regardless of chronic regulatory focus.

Now, for comparing the effects of gains versus nonlosses, regulatory focus theory predicts:

… because promotion success (gain) is success in achieving a maximal goal (a standard one hopes to achieve), it should be experienced more intensely than prevention success (nonloss), which is success in achieving a minimal goal (a standard one must achieve). (Liberman et al., 2005, p. 269)

Loss aversion, however, predicts a nonloss should garner a stronger reaction than a gain. These findings suggest an area for continued study in other contexts before conclusions can be made regarding the explanatory strength of loss aversion with respect to gains versus nonlosses.

Furthermore, most studies examining equivalent gain- versus nonloss-message framing have used quantitative descriptors (Boettcher, 2004; Idson et al., 2004; Kahneman & Tversky, 1979; Liberman

et al., 2005; McDermott, 2004; Tversky & Kahneman, 1981). Attempting to qualitatively frame equivalent nonloss and gain messages are of interest because not all information necessary to make a decision can be communicated quantitatively, such as messages about environmental impact or animal welfare on a farm. In fact, research has shown holistic environmental impact and animal welfare, in particular, are difficult to quantify objectively (Broom, 1991; Stolze et al., 2000). At best, quantified messages would be difficult for the average person to fully interpret (Bateman et al., 2007). Additional research is needed to test whether the predictions of loss aversion or regulatory focus hold for qualitatively defined frames/descriptors of equivalent gains and nonlosses.

Determining Framing Effects through Attitude

Framing effects can be measured through a variety of outcomes, but preferences (choices or decisions) and attitudes are common assessment methods. The concept of a preference is, in some ways, the counterpart in economics to the concept of an attitude in psychology, "but the logic of attitudes and the logic of preferences are quite different" (Kahneman & Sugden, 2005, p. 164). Preferences are subjective, but their logical structure is objective. If a consumer prefers a ground beef product that is 25% fat, they should prefer a product that is 75% lean. Attitudes are not objective in structure, and a consumer might have a negative attitude toward a ground beef product that is 25% fat but a positive attitude toward one that is 75% lean. The occurrence of framing effects does not violate the logic of attitudes as it does the logic of preference (Kahneman & Sugden, 2005). Preferences are best measured by making people choose between two options, while attitudes are best measured by affective responses to a single object.

Attitudes have a reasonable amount of stability. "This stability of attitudes lends some stability to the choices people make, but attitudes are also susceptible to a lot of manipulations that are not allowed to have any effect in a rational theory of preferences" (Kahneman & Sugden, 2005, p. 165). Attitudes, therefore, are susceptible to framing effects. Researchers have explained the framing of information affects the hedonic reaction people have toward the information (Brenner et al., 2007; Liberman et al., 2005). Because attitudes are composed of both hedonic and utilitarian components (Batra & Ahtola, 1981), this provides additional support for using attitude as a measure of framing effects.

Purpose and Hypotheses

The purpose of this study was to compare effects of qualitatively framed gain and nonloss messages on attitude. The theory of loss aversion (Tversky & Kahneman, 1981) predicts losses and potential losses garner a stronger hedonic reaction than gains. Therefore, avoiding a loss should yield a stronger response than achieving a gain. Although two studies specifically suggested gains are reacted to more strongly than nonlosses (Idson et al., 2004; Liberman et al., 2005) and offer the regulatory focus theory as an explanation, the literature testing and supporting the predictions of loss aversion is far more extensive.

To measure the effects of framing in this study, attitude toward the product was chosen as the dependent variable. An attitude is defined as an association between an object of thought and a valence evaluation with three components: cognitive, emotional, and behavioral (Ostrom, Bond, Krosnick, & Sedikides, 1994). Attitudes are not objective in nature (like preferences) and "are also susceptible to a lot of manipulations that are not allowed to have any effect in a rational theory of preferences" (Kahneman & Sugden, 2005, p. 165). Therefore, a framing effect should yield a change in attitude. In this study, participants' attitudes toward two products were assessed: one with claims and one

identical product without claims.

The literature, therefore, suggests the following hypotheses:

Hypothesis 1: Subjects exposed to nonloss-framed claims will have a stronger positive attitude toward the product with claims than those exposed to gain-framed labeling claims or control group claims.

Hypothesis 2: Subjects exposed to nonloss-framed claims will have a weaker positive attitude toward the product without claims than those exposed to gain-framed labeling claims or control group claims.

It is assumed the attitude for the products will remain positive (rather than negative) because the stimulus — boneless, skinless chicken breasts — is frequently consumed and no negative information was provided about either product. It is the top consumed protein in the United States, eaten at home an average of four times in a two-week period, and this specific cut is preferred 2:1 over other cuts (National Chicken Council, 2013a, 2013b).

Methodology

Subjects

To test the hypotheses, a posttest-only, randomized experimental design was used with a convenience sample of 660 college students at a large U.S. university. Students were offered course extra credit to incentivize participation. Cognitive psychologists argue that when examining cognitive mechanisms, such as memory, attention, or biases, college students are an acceptable sample because they maintain the same information processing systems in the brain into the future (Peterson, 2001). The nature of the study was to examine cognitive mechanisms (framing effects, loss aversion, and regulatory focus) that have shown prevalence in multiple nonstudent samples (Druckman, 2001) as well as student samples (Liberman et al., 2005).

In the case of marketing meat and poultry products with enhanced animal welfare and environmental, a key issue is identifying consumers or potential consumers for the product category. Young adults, specifically college students, are one segment of consumers for food products. There are more than 15.9 million college students in the United States, representing a $9.2 billion market that is viewed by packaged goods marketers as "a meaningful segment" on its own, with distinct characteristics, brand loyalties, and preferences for consumable goods, including food (Ness et al., 2002, p. 506). As a segment, traditional 18- to 24-year-old college students have been shown to differ from their similarly aged nonstudent peers, in that they are much more likely to live away from home, and thus are able to establish an independent lifestyle, including the need to develop life skills such as food shopping and meal preparation (Ness et al.). Students may even spend more on food as a percentage of their total living expenses compared with other consumers (Ness et al.). They are also more likely to be aware of diet and health issues as compared with the population as a whole (Ness et al.), which makes them a relevant target for marketing new food products and technologies. Also, research shows young consumers (ages 18 to 32), and those with a college education are more likely to purchase organic food products (Onyango et al., 2007).

Stimuli

To test the persuasive effects of qualitatively framed nonloss and gain messages, a virtual setting was designed to mimic a common food product comparison scenario in which subjects were presented with chicken product with advertising claims about environmental impact and animal welfare (referred to later as production claims) and a chicken product without these claims. The advertising

claims were chosen based on researcher observations of 33 farming methods claims regarding the environment or animal welfare on meat and chicken products at six different U.S. grocery store companies (two chain superstores, two chain supermarkets, two local stores).

The claims were pre-tested with 66 college students (who were not part of the sample included in the experiment) via survey to determine which of the 33 strongly suggested a gain or nonloss. Respondents were asked to evaluate each claim as to whether they thought it suggested avoidance of a negative outcome/impact or achieving a positive outcome/impact. Based on this survey and a Chi-square analysis of the data, the environmental gain-framed claim chosen was "good for the environment," and the nonloss-framed claim chosen was "no negative environmental impacts." These two claims are qualitatively equivalent in that a product produced in a way that does not have negative environmental impacts is good for the environment. In the same line of logic, a product produced in a way that is good for the environment does not have negative environmental impacts. The animal welfare nonloss-framed claim chosen was "no cages," and the gain-framed claim chosen was "free to roam." These two claims are qualitatively equivalent in that animals raised in a production system with no cages would be free to roam, and animals free to roam are not in cages. It is important to note broilers (chickens raised for meat) are not raised in cages like layer hens (egg-producing chickens) and are group-housed in large barns on the floor and are all "free to roam."

The claims were printed on a label, placed on a package of boneless, skinless chicken breasts, and photographed (labels were used on the same chicken package to ensure reliability). Chicken was chosen to ensure reliability of the study because it is a uniform product with little to no differences of product characteristics that are visually detectable within a given cut category (e.g., chicken breasts, thighs, whole chicken, etc.). In addition, chicken is a product consumers choose primarily based on color with no consideration for marbling or other visual quality cues (Becker et al., 2000). Because of the standardization of this product, chicken was ideal for experimental purposes to ensure participants are making their decisions based on the claim and not on physical quality characteristics. Variables of price, weight, brand, and product were controlled to test the framing effects exclusively.

Measures

After viewing the product with claims and product without claims simultaneously, subjects' attitudes toward each product (with claims and without claims) were measured. The measure of attitude toward product without claims was included because advertising offers product comparison information to consumers. Advertising works by influencing consumers' assessment of not only the advertised product, but also the competing product(s). The scale developed by Batra and Ahtola (1991) measures the hedonic and utilitarian sources of consumer attitudes using 12 semantic-differential questions. The researcher added four items to this scale to measure product-specific attitude: safe/unsafe, humane/inhumane, good for environment/bad for environment, healthy/unhealthy. All 16 items were measured on a five-point semantic differential scale where 1 = negative and 5 = positive; none were reversed.

Procedure

Subjects were randomly assigned (with the use of a random number generator) to either the nonloss-framed claims condition, the gain-framed claims condition, or the control claims condition to test the hypotheses. In the gain-frame and nonloss-frame conditions, subjects simultaneously viewed a package of chicken with two production claims, brand, cut, weight, and price on the label and a package of chicken with only brand, cut, weight, and price on the label (referred to hereafter as the

product without claims). In the control condition, subjects simultaneously viewed a product without claims and a product with general product claims (boneless and skinless, and chicken breasts). The claims and treatment conditions are shown in Figure 2. Subjects' attitude toward the product with claims and the product without claims were measured. After the dependent measures were assessed, demographic data was collected, manipulation checks were conducted, and subjects read a debriefing statement about the study. Data were analyzed using one-way analysis of variance to determine framing effects on attitudes.
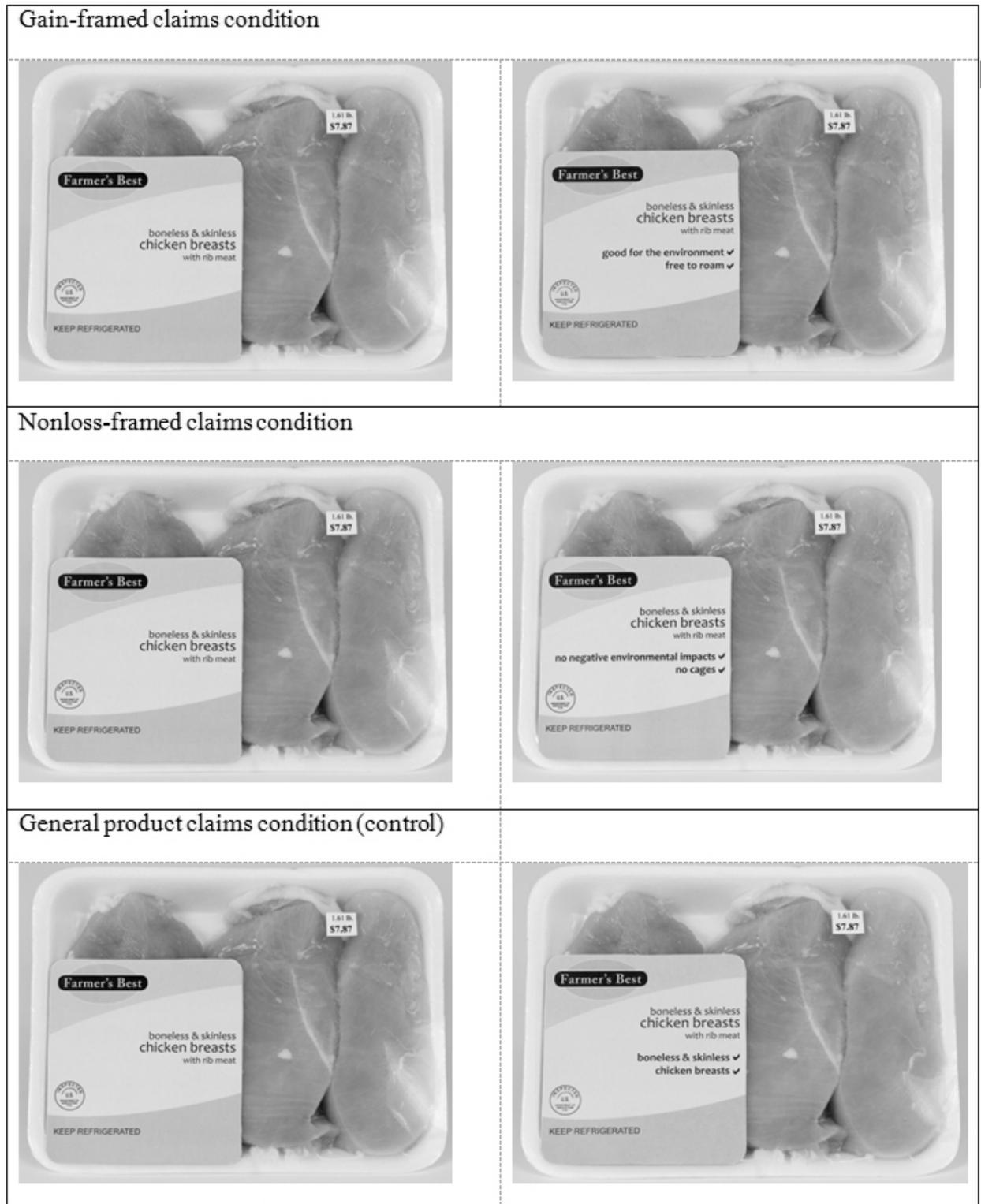

Figure 2. Experimental conditions

Results

Descriptive analysis indicated 459 of subjects were female (69.5%) and 201 were male (30.5%); 660 subjects participated in the study. Subjects ranged in age from 18 to 33 years old, with a mean of 21 years old (*SD* = 1.69). Most described the community in which they grew up in as a subdivision in a city or town (*n* = 491, 74.4%), followed by rural, not a farm (*n* = 98, 14.8%), downtown in a city or town (*n* = 47, 7.1%), and farm (*n* = 23, 3.5%). The majority of subjects indicated they consumed meat or poultry on a regular basis, with most eating it 4–7 times per week (*n* = 258, 39.1%) and 8–14 times per week (*n* = 216, 32.7%). Only 27 (4.1%) indicated they never eat meat or poultry, and 14 (2.1%) indicated they eat it less than once per week.

The grand mean on attitude toward the products without claims was 3.53 (*SD* = .84). The grand mean attitude toward the products with claims was higher (*M* = 4.04, *SD* = .74). Overall, attitude toward the product with claims was more positive than attitude toward the product without claims. Table 1 shows the descriptive statistics for each item in the attitude scale between the treatment groups. The alpha reliability coefficient for the scale in this study was α = .96 on attitude toward product without claims and α = .96 on attitude toward product with claims. Therefore, the 16-item scales were collapsed into two separate scores representing subjects' attitude toward the products in preparation for analysis for the hypotheses.

Table 1
Attitude toward Products

	Attitude Toward Product Without Claims			Attitude Toward Product With Claims		
	n	*M*	*SD*	*n*	*M*	*SD*
Useless:Useful	660	3.98	.98	660	4.18	.87
Worthless:Valuable	660	3.86	.97	660	4.14	.85
Harmful:Beneficial	660	3.62	1.08	660	4.17	.85
Foolish:Wise	660	3.42	.94	660	3.82	.96
Unpleasant:Pleasant	660	3.49	1.04	660	3.93	.93
Awful:Nice	660	3.49	.96	660	3.91	.91
Disagreeable:Agreeable	660	3.54	.99	660	3.90	.93
Sad:Happy	660	3.23	.99	660	3.71	.92
Bad:Good	660	3.53	1.08	660	4.01	.92
Negative:Positive	660	3.41	1.05	660	4.04	.91
Dislike:Like	660	3.57	1.13	660	4.05	.93
Unfavorable:Favorable	660	3.42	1.15	660	4.08	.95
Unhealthy:Healthy	660	3.70	1.09	660	4.27	.84
Unsafe to eat when cooked: Safe to eat when cooked*	660	4.25	.97	660	4.46	.85
From an animal treated inhumanely: From an animal treated humanely*	660	2.92	1.15	660	3.95	1.10
Bad for the environment: Good for the environment*	660	3.08	1.04	660	3.96	1.02

Note: Scores based on semantic differential scale from 1= negative to 5= positive. *Researcher-developed item to measure product-specific attitude.

Hypothesis 1: Subjects exposed to nonloss-framed claims will have a stronger positive attitude toward the product with claims than those exposed to gain-framed labeling claims or control group claims.

A one-way between-groups analysis of variance was conducted to compare the different claim framing effects on attitudes toward the product with the claims. The independent variable was the frame of the claim (nonloss, gain, control), and the dependent variable was attitude toward the product with the claims. Preliminary assumption testing showed no serious violations.

There was a significant effect of claim frame on attitudes toward the product with production claims, $F(2, 657) = 16.87$, $p < .001$ (see Table 2).

Table 2

Effects of Claim Frame on Attitudes Toward Product with Claims

Source	SS	df	MS	F	p
Claim Frame	17.49	2	8.75	16.87	< .001
Error	340.53	657	.52		
Total	358.02	659			

Planned contrasts revealed subjects exposed to gain-framed claims had more positive attitudes toward the product with the claims than those exposed to general product claims $t(424) = -5.26$, $p < .001$, and those exposed to nonloss-framed claims had more positive attitudes in comparison to the control group as well $t(452) = -4.79$, $p < .001$. The difference between gain and nonloss claim frames, however, was not significant $t(444) = -.64$, $p = .52$ (2-tailed) (see Table 3).

Table 3

Planned Comparisons t-test for Differences between Treatment Groups on Attitude toward Product with Claims

	n	M	SD	t	df	p
Gain-Framed Production Claims	208	4.17	0.67	-5.26	657	< .001
General Product Claims (Control)	216	3.80	0.81			
Nonloss-Framed Production Claims	236	4.13	0.68	-4.79	657	< .001
General Product Claims (Control)	216	3.80	0.81			
Gain-Framed Production Claims	208	4.17	0.67	-.64	657	.52
Nonloss-Framed Production Claims	236	4.13	0.68			

Note. Means ranged from 1 (most negative) to 5 (most positive).

Hypothesis 2: Subjects exposed to nonloss-framed claims will have a weaker positive attitude toward the product without claims than those exposed to gain-framed labeling claims or control group claims.

A one-way between-groups analysis of variance was conducted to compare the different claim

framing effects on attitudes toward the product without the claims. The independent variable was the frame of the claim (nonloss, gain, control), and the dependent variable was attitude toward the product without the claims. Preliminary assumption testing was conducted with no serious violations noted.

There was a significant effect of claim frame on attitudes toward the product without production claims, $F(2, 657) = 6.41$, $p = .002$ (see Table 4).

Table 4

Effects of Claim Frame on Attitudes toward Product without Claims

Source	SS	df	MS	F	p
Claim Frame	9.86	2	4.43	6.41	.002
Error	453.90	657	.69		
Total	462.76	659			

Planned contrasts revealed subjects exposed to gain-framed claims had less positive attitudes toward the product without the claims than those exposed to general product claims $t(424) = 2.12$, $p = .035$, and those exposed to nonloss-framed claims had less positive attitudes in comparison to the control group, as well $t(452) = 3.56$, $p < .001$. The difference between gain and nonloss claim frames, however, was not significant $t(444) = -.1.37$, $p = .17$ (2-tailed) (see Table 5).

Table 5

Planned Comparisons t–test for Differences between Treatment Groups on Attitude toward Product without Claims

	n	M	SD	t	df	p
Gain-Framed Production Claims	208	3.51	0.81	2.12	657	.035
General Product Claims (Control)	216	3.68	0.81			
Nonloss-Framed Production Claims	236	3.41	0.87	3.56	657	< .001
General Product Claims (Control)	216	3.68	0.81			
Gain-Framed Production Claims	208	3.51	0.81	-1.37	657	.170
Nonloss-Framed Production Claims	236	3.41	0.87			

Note. Means ranged from 1 (most negative) to 5 (most positive).

Summary

Based on the theories of framing effects, loss aversion, and regulatory focus, the first hypothesis predicted subjects exposed to nonloss-framed claims would have more positive attitudes toward the product with production claims than those exposed to gain-framed labeling claims or control group claims. This hypothesis was partially supported. The gain- and nonloss-framed claims did not lead to significantly different attitudes toward the product with the claims. Subjects in both treatment conditions had positive attitudes toward the product with claims, regardless of whether the claims were framed as nonlosses or gains. Subjects exposed to gain or nonloss claims had more positive attitudes towards the product with the claims than those exposed to neutral, general product claims, but this

Research appears as vertical text in the left margin.

points to an effect of the treatment conditions' use of production claims than the frames themselves.

The second hypothesis predicted subjects exposed to nonloss-framed claims would have less positive attitudes toward the product without production claims than those exposed to gain-framed labeling claims or control group claims. This hypothesis was partially supported. Subjects exposed to gain claims did not differ from those exposed to nonloss claims in their attitudes toward the product without the claims. Subjects exposed to gain or nonloss claims had less positive attitudes towards the product without the claims than those exposed to neutral, general product claims. Again, this was likely because of the production claims subjects were exposed to in the treatment conditions rather than the framing.

Discussion/Conclusions

Previous loss aversion research consistently showed people have stronger reactions to information presented as potential losses/nonlosses when compared to equivalent potential gains/nongains (Boettcher, 2004; Kahneman & Tversky, 1979; McDermott, 2004; Tversky & Kahneman, 1981). Conversely, a few other studies suggested gains garner a stronger reaction than nonlosses (Idson et al., 2000; Idson et al., 2004; Liberman et al., 2005).

The present study did not find loss/gain asymmetry in support of either prediction. Whether subjects were exposed to gain-framed production claims or nonloss claims did not matter, attitudes toward the products were affected similarly. This could be because the application of the message/ information was directly connected with an ordinary market good: food. Horowitz and McConnell (2002) found the more a product is like an "ordinary market good," the lower the degree of gain/loss asymmetry. The production claims themselves, however, were less about the product itself and more about the product's implications for environmental impact and animal welfare. The environment and animal welfare are non-market goods and cannot be directly experienced by the consumer, such is the nature of these attributes (Darbi & Karni, 1973). Perhaps the predictions of loss aversion would hold when testing the production labeling claims in the absence of the food product. While that would be a clearer test of the prediction, it is less representative of the reality of how these production claims are frequently encountered by consumers.

Another reason framing effects were not found could be that the messages (the production claims) in this study were presented in a qualitative manner rather than the typical quantitative manner used in many previous studies supporting loss aversion (Kahneman & Tversky, 1979; Tversky & Kahneman, 1981; Levin et al., 1998; Boettcher, 2004; McDermott, 2004) and in those supporting regulatory focus theory (Idson et al., 2000; Idson et al., 2004; Liberman et al., 2005). As mentioned in the literature review, holistic environmental impact and animal welfare are difficult to quantify objectively (Broom, 1991; Stolze et al., 2000), or, at best, would be difficult for the average consumer to fully interpret (Bateman et al., 2007). Consumers rely on food production certification agencies (government and third-party) to make the interpretations and provide them a trustworthy generalization of the meanings of good animal welfare and environmental impact (Caswell & Mojduszka 1996; Golan et al., 2001).

Also, framing information as gains and nonlosses primarily affects the reference point people use to make judgments and decisions (Heath, Larrick, & Wu, 1999). Soman (2004) explained values are coded as gains and losses relative to a reference point, meaning a decision is reference dependent. Presenting messages in a qualitative manner might cause people to automatically adjust their reference point because neither numerical values nor words describing a move from one point to another (i.e., increase/decrease, worsen/improve) are available to encode the message as a gain or

a nonloss. Qualitatively created frames, like "no negative environmental impacts" vs. "good for the environment," may not communicate the intended reference point strongly enough; therefore, they are equally persuasive on attitudes. Bateman, Day, Jones, and Jude (2009) suggested an individual is able to interpret that one numeric value is larger than another without necessarily understanding its meaning, thereby leading to the reliance on heuristics and biases to form judgment.

This study attempted to frame nonlosses and gains equivalently, but qualitatively. The results suggest that in the absence of numbers or quantifiable information, the biases of loss aversion and framing effects are minimized. The message may need to include terms more strongly suggesting a reference point, such as "reduce environmental impact" or "improve environmental impact," to induce the biases.

Limitations

While the present study offers several useful theoretical and practical insights, there were some limitations. The convenience sample of college students is one key limitation, primarily for the practical implications and recommendations, for two reasons. First, randomized samples as opposed to convenience can offer greater external validity (Tashakkori & Teddlie, 2003). Second, college students are still developing their consumer habits, which may change with further maturity, experience, and when starting a family. For example, consumers with children are more likely to learn about and purchase organic foods (Hughner et al., 2007). Readers should carefully consider the demographic information before applying conclusions to other populations.

Recommendations for Future Research

From a theoretical perspective, more research needs to be done examining the effects of gains versus nonlosses. This study attempted to further some of the previous research in that area (Idson et al., 2004; Liberman et al., 2005), but perhaps due to the qualitative nature of the frames and the nature of the application (food product), did not find asymmetry in the attitudinal reactions to gains versus nonlosses. Researchers in these theoretical areas should consider future studies that attempt to manipulate gains and nonlosses qualitatively to determine if biases are minimized as a result.

The manipulations of nonloss and gain messages in future studies should include terms like "reduce" and "improve" to more strongly suggest a reference point that is moved toward or away from to determine if the biases of loss aversion and regulatory focus fit effect are subsequently induced.

The present study held several variables consistent to determine the effect of the differently framed production labeling claims on attitudes. Additional manipulations of variables such as product type, price, brand, and other packaging characteristics would be beneficial to marketers and may produce different attitudinal effects.

Recommendations for Practitioners

Gain-framed claims produced slightly (but not statistically significant) more positive attitudes toward the product with claims, but slightly less negative attitudes toward the product without claims. Marketers of credence attribute food products could potentially encourage purchase by placing products with gain-framed claims in their own section of the grocery store (away from the conventional products without the claims) and those with nonloss-framed claims next to the conventional items. However, additional research adding price variation as an additional independent variable would need to be considered.

Marketers and communicators attempting to leverage the persuasive power of the loss aversion

cognitive bias should consider doing so with the use of numbers or quantifiable information when possible. Raw data, however, would likely be difficult to interpret, so providing some system of interpretation or relatable comparisons (e.g., equivalent of taking 500 cars off the road) would be more beneficial. When providing such exact information may be difficult for communication about certain farming practices, terminology that strongly suggests a nonloss reference point (e.g., reduce, decrease, less/fewer) may, theoretically, capitalize on the loss aversion bias.

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Research

A Review and Evaluation of Prominent Theories of Writing

Holli R Leggette, Tracy Rutherford, Deborah Dunsford, and Lori Costello

Abstract

Theoretical frameworks bring order to phenomena and provide a context for both research and practice. However, it has only been in the last four decades that theoretical frameworks have guided writing research. Before the 1980s, writing research focused more on mechanics and grammar than on cognitive thought processes related to writing. During the mid-1990s, theories shifted to a more sociocultural view of writing. Therefore, the purpose of this study was to apply theory evaluation criteria to theories of writing to review and evaluate their use and applicability in modern-day writing research. A literature review yielded three theories consistent across publications: cognitive process theory of writing, social cognitive theory of writing, and sociocultural theory of writing. The theories were reviewed and evaluated using accuracy, consistency, fruitfulness, simplicity/complexity, scope, acceptability, and sociocultural utility. Since the 1980s, writing researchers have modified theories to define writing ideas, concepts, and relationships. Cognitive processes should also be included in writing theories because of their importance in knowledge construction. Of the three theories that were reviewed and evaluated, the social cognitive theory of writing was the most complete. Its structure included society's influence on writing and the cognitive processes involved in writing development. Each writing theory brought a unique perspective to writing research, but Flower's theory was a complete theory that incorporated an in-depth look at writing as a product of cognitive processes situated within society. However, more research needs to be done on its applicability in agricultural communications research and practice.

Key Words

writing, evaluation, theories of writing

Introduction

Research is not meaningful without theory, and theory does not have meaning without research to test and generate theory (Camp, 2001). A "theory is a mental activity" (Turner, 1986, p. 4) through which ideas about reality are constructed. Theories are also "set[s] of interrelated universal statements, some of which are definitions and some of which are relationships assumed to be true, together with a syntax, a set of rules for manipulating the statements to arrive at new statements" (Cohen, 1980, p. 171). Theories should "explain the observed facts, … be consistent with observed facts and with the already established body of knowledge, … provide means for its verification, … stimulate new discoveries[,] and indicate further areas in need of investigation" (Ary, Jacobs & Sorensen, 2010, pp. 15–16). More recently, Kitchel and Ball (2014) established a working definition of theory for quantitative research in agricultural education: "used to explain and predict phenomena and … to answer 'what', [*sic*] 'how[,]' or 'why' particular phenomena occurred" (p. 189).

However, discrepancies exist about what defines a theoretical framework (Camp, 2001) and what qualifies as theory in the theoretical paradigm of research (Dudley-Brown, 1997). Strickland (2001) said a theory is useless if it cannot be tested, but Dudley-Brown argued that empirically testing a theory is only one form of evaluation. Fawcett (1989) suggested analyzing a work's purpose through

its description, explanation, or prediction of concrete, explicit phenomena as a way to determine if the work is a theory. Similarly, Chinn and Kramer (1983) said theory is "a set of concepts, definitions, and propositions that projects a systematic view of phenomena by designating specific inter-relationships among concepts for purposes of describing, explaining, predicting, and/or controlling phenomenon" (p. 70).

Creswell (1994) identified three categories of theories—grand, middle-range, and substantive—which could explain the variations in theory definitions. A grand theory is a general and comprehensive theory with abstract concepts that cover all aspects of human experience related to a specific topic. Researchers do not generally test a grand theory, which is developed through years of research and thought (McEwen & Wills, 2014). A middle-range theory has a middle-ground look at reality and is derived from grand theories, practice, or literature reviews. The concepts within the theory are more concrete, and researchers can find testable hypotheses within a middle-range theory. Often times, middle-range theories are models that can be tested (McEwen & Wills). A substantive theory, or practice theory, as explained by McEwen and Wills, is a simple, straightforward view of reality. The concepts within a substantive theory are operationalized, and the outcomes can be easily defined and tested. Substantive theories are often derived from grounded theory studies (McEwen & Wills).

In addition to understanding theories according to category, theory use is the "specification of relationships" in quantitative research and the "explanation of reality" in qualitative research (Camp, 2001, p. 4). Kitchel and Ball (2014) noted that quantitative studies in agricultural education are most often conducted using middle-range and substantive theories. Conversely, a qualitative researcher's perspective of theory is both theory building and theory testing. Theory building is a preferred approach, but it is dependent on the type of qualitative research (Bryman, 2012).

Pre-1970s writing instruction was focused on improving student errors—the mechanics of writing—and was largely explicit to English and the humanities genre (Foster, 1983; Nystrand, 2006; Rose, 1985). However, since that time, writing has become a stimulus of thought with a direct connection to the writer's thought process—"an activity of the mind" (Foster, p. 24). Since the 1980s, writing researchers have worked to develop theoretical and conceptual frameworks related to writing (Becker, 2006). Early empirical writing research was believed to be a precursor to improving writing instruction (Nystrand) and was not built on theoretical frameworks. The early years of writing research focused primarily on investigating writing skill and ability and not on writing as a knowledge creation and human development tool. However, at the end of the 20th century, researchers shifted their work from defining writing to investigating "writing in all its situated contexts, especially beyond school" (Nystrand, p. 22).

Eventually, the work of the early researchers would lead to a writing research movement in the 1970s and 1980s, and the culmination of early research agendas would soon influence theory and model development in writing (Nystrand, 2006). Early writing research was conducted with theoretical underpinnings of cognitive processes without the inclusion of society and culture (Prior, 2006). The cognitive approach described writing as a function of what occurs in the writers' minds, not as a function encouraged and impacted by the social contexts and situations that occur in the world where writers exist (Deane et al., 2008). Prior argued that writing is situated within the social context of the writer and is impacted by communities of practice occurring as a part of the situated social context. Therefore, writing research has become more holistic, focusing more on the situation as a whole and not on the writer and the text.

Framework development in writing is marked by four eras—Hayes and Flower's work on text production, Bereiter and Scardamalia's work on the development of writing expertise, Levelt's work

on speaking, and both Hayes' and Kellogg's work on the relationship of text writing and working memory (Alamargot & Chanquoy, 2001). However, Wallace, Jackson, and Wallace (2000) argued that, although many writing frameworks exist, the frameworks lack the empirical evidence to inform the teaching writing profession.

In 1991, Raimes proposed theories and practices of teaching writing could be classified according to four elements that guide both education and research: form, writer, content, and reader. The element of form is the "linguistic and rhetorical conventions of the text" (Raimes, pp. 238–239). During the 1960s and 1970s, the teaching of writing was centered on the form-focused approach—formal features of writing (rhetorical form and accurate grammar) instead of writing as a relationship among the reader, writer, and content (Raimes).

Additionally, the element of the writer is the "writer's ideas, experiences, feelings, and composing processes" (Raimes, 1991, pp. 238–239). Writing research of the 1970s influenced the writer-focused approach, which encouraged writers "to think through issues by means of writing about them, to practice generating and revising ideas through the act of writing, and to read, discuss, and interpret texts" (Raimes, p. 241). The writing- process approach described by multiple researchers (e.g., Hayes and Flower, 1980) is a writer-focused approach.

Further, the element of the content is the subject matter of the work (Raimes, 1991). The content-focused approach was the new process approach, focusing more on content than on the features of writing or the writer (Raimes). This approach emphasized that language courses have no value as standalone courses because they are service courses to other subject matter areas (Raimes).

Lastly, the element of the reader related "specifically [to] the expectations of the academic audience" (Raimes, 1991, pp. 238–239). The reader-focused approach overvalued the reader, audience, or discourse community. The reader and content are accentuated, and the writer and his/her expertise get lost in the process.

Placing more emphasis on one element over the other creates an unbalanced stance (Raimes, 1991). Therefore, writers' main goal should be to maintain a balanced stance between all elements of writing (Booth, 1963). Writers need to understand their audience and its expectations and characteristics, so they can determine what and how to write (Alamargot & Chanquoy, 2001). They must constantly control text production so only the pertinent and necessary information is generated and conveyed (Alamargot & Chanquoy). "A balanced approach [of writing] recognizes that the four elements…are not discrete entities to be emphasized and reduced to prescriptions…they are fluid, interdependent, and interactive" (Raimes, p. 246). Writers become readers, readers become writers, content and subject matter are not independent, and form is the product of the reader, writer, and content (Raimes).

Since the early 20th century, agricultural communicators have used writing to disseminate knowledge about the agricultural industry (Boone, Meisenbach, & Tucker, 2000). In recent decades, researchers (Ettredge & Bellah, 2008; Morgan, 2010; Sitton, Cartmell, & Sargent, 2005; Sprecker & Rudd, 1997; Terry et al., 1994) have identified writing as a key competency needed by agricultural communicators. Perhaps, that is because "writing is not just a skill with which one can present or analyze knowledge. It is essential to the very existence of certain kinds of knowledge" (Rose, 1985, p. 348). Writing has been, and continues to be, one form of storytelling in agriculture (Telg & Irani, 2011). Even so, Sitton, Cartmell, and Sargent reported writing was an important part of the course curricula in agricultural communications.

Writing skill is an important component of education, research, and practice, yet the existing theories may lack sufficient empirical evidence that supports writing education. Understanding writ-

ing theories, and how they can be applied, will begin to provide a framework for constructing empirical evidence to modify and update theoretical frameworks in writing. Therefore, the purpose of this study was to apply Dudley-Brown's (1997) theory evaluation criteria to the three prominent writing theories in writing research to review and evaluate their use and applicability in modern-day writing research. Four objectives guided this study:

1. Identify theory evaluation criteria that can be used to evaluate writing theories,
2. Identify the most documented theories in writing research,
3. Review the most documented theories in writing research, and
4. Evaluate the most documented theories in writing research.

Method

The method used in this study was part of the reporting for a larger research project, *A model to augment critical thinking and create knowledge through writing in the social sciences of agriculture*. The research method is fully described within, but similar methods exist as a larger project (Leggette, 2013).

The foundation of this research study is Dudley-Brown's theory evaluation criteria (1997). "To utilize theory appropriately, in all domains of practice, education[,] and research, it is important to know how to describe, analyze[,] and evaluate theory" (Dudley-Brown, p. 76). Theory evaluation, according to Meleis (1985), offers constructive criticism of the framework, modification of the current theory, and researcher appreciation for theory development. Dudley-Brown) noted theory evaluation should be conducted to make an informed analysis of theory before and after it is applied to research and before it is used in education and practice. Theory evaluation is both subjective and objective, but subjectivity can be reached if a set of formal criteria is used (e.g., Dudley-Brown).

Dudley-Brown (1997) proposed a criteria-approach evaluation of nursing theory she created using a culmination of criteria suggested by nursing theory evaluators, one of which was Fawcett's (1989) evaluation of conceptual frameworks. Theoretical framework research within the nursing paradigm has been well-developed and documented for many years. Nursing theory definitions originated in psychology and social sciences with underlying principles rooted in the nurturing instincts of human nature. Longest (2002) said nursing research is focused on societal issues that affect human health determinants (e.g., environment, human behaviors, social factors, biological factors). Shoemaker et al. (2004) defined social science as the "knowledge of nature and the natural world … [and the] study of naturally occurring phenomena, and how they relate to each other, the structure of the universe, and the activity of its elements" (p. 3). Because social science is the study of nature and how things occur in nature and nursing is the study of societal issues related to human health determinants, it may be concluded there is a logical connection between nursing theory and social science theory.

Dudley-Brown (1997) noted theory evaluation should be conducted using a set of specific criteria—accuracy, consistency, fruitfulness, simplicity/complexity, scope, acceptability, and sociocultural utility (see Table 1 for a complete description of each criterion). The criteria proposed by Dudley-Brown provided a more quantifiable and observable way to evaluate theory, accounting for objective, subjective, internal, and external criteria in the evaluation. Additionally, Dudley-Brown modified and expanded on Kuhn's (1977) theory evaluation terms and documented theory evaluation researchers as influential in her theory evaluation criteria to ensure it was robust in presentation and evaluation.

Table 1
Definitions of Theory Evaluation Criteria

Criterion	Definition	Related Citations
Accuracy	A world view of the culture where it is used and applied (Dudley-Brown, 1997)	Kuhn, 1977
Consistency	Internal consistency; language, logical order, and connectedness (Newton-Smith, 1981); clarity (Meleis, 1985)	Ary et al., 2010; Barnum, 1998; Chinn & Kramer, 1983; Kuhn, 1977; Meleis, 1985; Newton-Smith, 1981
Fruitfulness	"Fruitful, bountiful, productive, and prolific" (Dudley-Brown, 1997, p. 80); reveals new feelings, phenomena, or unknown relationships (Kuhn, 1977); further research ideas (Newton-Smith, 1981); generate hypothesis (Ellis, 1968); problem-solving, research tradition (Laudan, 1977)	Ary et al., 2010; Barnum, 1998; Ellis, 1968; Hardy, 1974; Kuhn, 1977; Laudan, 1977; Newton-Smith, 1981
Simplicity/ Complexity	Concepts, phenomena, and relationships in the theory (Meleis, 1985); balance of simplicity and complexity (Dudley-Brown, 1997); can be simple[1], complex[2], or pragmatic[3]	Ary et al., 2010[1]; Barnum, 1998[2]; Chinn & Kramer, 1983[1]; Ellis, 1968[2]; Kuhn, 1977[1]; Meleis, 1985[3]; Newton-Smith, 1981[1]
Scope	Phenomenon and its context (Barnum, 1998); based on level of theory (e.g., middle range theory; Dudley-Brown, 1997); increased number of facts and concepts, more significant theory (Ellis, 1968); more general, more useful (Hardy, 1974); focused on developing specific theories (Jacox, 1990); can be broad[1], narrow[2], or pragmatic[3]	Barnum, 1998[3]; Ellis, 1968[1]; Hardy, 1974[1]; Jacox, 1974[2]
Acceptability	Adoption of theory by others (Dudley-Brown, 1997); practice (direction, applicability, generalizability, cost effectiveness, and relevance); education (philosophical statements, objectives, and concepts); research (consistency, testability [research potential or empirical adequacy], and predictability)	Ary et al., 2010; Barnum, 1998; Ellis, 1968; Fitzpatrick & Whall, 2005; Laudan, 1977; Meleis, 1985
Socio-cultural Utility	Social congruence and social significance (Fawcett, 1989; Johnson, 1974; Meleis, 1985); transferability (Dudley-Brown, 1997)	Fawcett, 1989; Johnson, 1974; Meleis, 1985

We used the pragmatic and methodical theory evaluation criteria proposed by Dudley-Brown (1997) because of its inclusion of theory evaluation literature and research. Her evaluation criteria provided us the opportunity to evaluate the concrete, explicit theories through the rigorous theory evaluation criterion. Many of the criterion were transferrable to other disciplines, but some points of the criteria were related directly to nursing. Therefore, we modified Dudley-Brown's nursing theory evaluation criteria to meet the needs of this study.

To modify the criteria, we reviewed related literature (e.g., Barnum, 1998; Ellis, 1968; Hardy, 1974; Jacox, 1974) cited in Dudley-Brown because the literature provided us with descriptions, examples, and criteria that better explained each evaluation criterion. Once we had an in-depth understanding of each criterion, we reviewed each criterion within the context of writing to establish the evaluation criteria for this study. Personal experience, as well as literature on writing theories, provided the data for the qualitative coding template (Saldaña, 2013; see Table 2 for the coding descriptions). A researcher's position helps the reader to clarify how and why the data were interpreted (Merriam, 2009). "The qualitative analyst owns and is reflective about her or his own voice and perspective" (Patton, 2002, p. 41) as the data collector and interpreter (Merriam). As such, the qualitative coding (Saldaña) template included the descriptions, inclusion and exclusion evaluation criteria, and the typical exemplars in the context of writing for each of Dudley-Brown's (1997) criterion.

Table 2

Descriptions, Inclusion and Exclusion Evaluation Criteria, and Typical Exemplars in the Context of Writing for each of Dudley-Brown's (1997) Criterion

Criterion	Evaluation Criteria
Accuracy	**Description:** True representation of writing, incorporates key components of the writing process **Inclusion criteria:** Author claimed; audience, critical thinking, content and discourse knowledge, context **Exclusion criteria:** Transcription, technology **Typical exemplars:** Contains the writing process (e.g., drafting, editing, revising, feedback, planning)
Consistency	**Description:** Internal consistency, evidence of reliability **Inclusion criteria:** Author claimed; clear, consistent language; logically connected; consistent terms, principles, and methods; clear definitions and concepts; coherent **Exclusion criteria:** Inconsistent **Typical exemplars:** Statement of reliability; consistent language; clear concepts
Fruitfulness	**Description:** New feelings, phenomena, or relationships; explains phenomenon; generates hypothesis; examines prior work; contains development ideas; addresses issues; has research potential **Inclusion criteria:** Author claimed; significant, revelation of new phenomena, solves problems; leads to new research **Exclusion criteria:** Does not contain ideas for further development **Typical exemplars:** Has potential for continued research; Research opportunities are not stagnant
Simplicity/ Complexity	**Description:** Number of phenomena, relationships, and concepts identified in the theory; consistently simple; consistently complex **Inclusion criteria:** Author claimed; easy to understand; simple or complex graphical representation; contains further explanation of hard-to-understand pieces **Exclusion criteria:** Unbalanced—simple concepts and complex concepts within one theory **Typical exemplars:** Clarifies isolated, confused, and hard-to-understand phenomenon
Scope	**Description:** Dependent on the phenomenon and its context **Inclusion criteria:** Author claimed; grand, middle-ranging, or substantive; narrow—focused on specific concepts and facts; broad—general and useful; pragmatic approach **Exclusion criteria:** Scope is not indicative of its purpose **Typical exemplars:** Grand, middle range, or substantive theory
Acceptability	**Description:** Level to which the theory has been adopted and accepted in research and practice; adoption in various contexts within the discipline **Inclusion criteria:** Number of citations, according to Google, based on the time since publication (If it has been accepted by researchers, it would have more citations than a theory that has not been accepted. The longer it has been in publication, the more citations it should have.); critique as usefulness **Exclusion criteria:** Administration **Typical exemplars:** Adaptability to use in practice (e.g., direction, applicability, generalizability, cost effectiveness, relevance); education (e.g., philosophical statements, objectives, concepts); and research (e.g., consistency, testability, predictability)
Sociocultural Utility	**Description:** Takes into account cultures' beliefs, values, and expectations; transferability; consistency of goals and values systems; potential to make a difference in the lives of those who use it **Inclusion criteria:** Consistent with the society in which it was developed; theories adopted for writing in the Western culture may not be relevant to other cultures **Exclusion criteria:** Inconsistent within society **Typical exemplars:** Adaption of Western theories to other cultures

After we identified the evaluation criteria and developed the qualitative coding template, we sought to identify prominent writing theories. First, we reviewed the literature to determine the most documented theoretical frameworks. We used Google Scholar, [University] library, and WorldCat.org to search for literature related to writing theories. To be included in the study, each theory had to be cited within the writing research literature and had to include theory in its title. The literature review yielded three theories—cognitive process theory of writing (Flower & Hayes, 1981), social cognitive theory of writing (Flower, 1994), and sociocultural theory of writing (Prior, 2006). Once we identified the theoretical frameworks to review, we further reviewed the literature to locate the original theory reference. In our search, we found the three original theories, as well as supporting works.

Lastly, we reviewed and evaluated the theoretical frameworks. The review and evaluation process were simultaneous. The review process required us to immerse ourselves into the frameworks to understand the concepts within each theory. While critically reading and evaluating each theory and its supporting literature, we took notes using a replica of Table 2. We sought to find criteria and examples that fit the criteria established by Dudley-Brown (1997). If a theory did not meet the evaluation criteria set forth for a particular criterion (e.g., accuracy), we documented the theory's failure to meet the criteria for that particular criterion. For some criterion, we determined the author indicated the theory met or did not meet a specific set of established criteria and provided an example, which was also documented. After our critical evaluation of each theory, we formulated a narrative from our notes, which we developed using Table 1 and 2, and documented key characteristics for each particular framework as it related to Dudley-Brown's theory evaluation criteria.

Findings

For this study, a theory evaluation criteria was identified and modified for use in the context of writing. Dudley-Brown's (1997) theory evaluation criteria was identified as a pragmatic, methodological approach that has application in writing and other social science disciplines. The criteria was applied to three prominent writing theories—cognitive process theory of writing (Flower & Hayes, 1981), social cognitive theory of writing (Flower, 1994), and sociocultural theory of writing (Prior, 2006)—as a means to review and evaluate the work.

Cognitive Process Theory of Writing (Flower & Hayes, 1981)

Flower and Hayes (1981) developed the cognitive process theory of writing as a foundation to inform research and practice about the thinking processes that occur during the writing process. The theory has four points: (a) "… writing is … a set of distinctive thinking processes which writers orchestrate or organize during the act of composing" (Flower & Hayes, p. 366); (b) the components of the process are hierarchical and can be in embedded within each other; (c) "composing itself is a goal-directed thinking process, guided by the writer's own growing network of goals" (p. 366); and (d) writers should set goals representing their purpose by modifying current goals or create new goals based on experience.

The cognitive process theory of writing, however, is not a traditional stage model (Flower & Hayes, 1981) because writers do not move through linear stages of development before completing a product. Writers move through units of mental processes situated within a hierarchical structure with embedded components (Flower & Hayes). For example, generating ideas is a mental sub process of planning. When writers encounter a problem within the process, they could retreat back to one of the earlier processes and work through the process for that particular problem (Flower &

Hayes). Flower and Hayes referred to the mental processes as the writer's tool kit, which could be used at any point in the process.

Furthermore, the writing process is directed by goals, which are created and modified during the process (Flower & Hayes, 1981). Goal-directed thinking, as described by Flower and Hayes, included describing goals, developing plans to meet those goals, and evaluating the success of those goals. This goal-directed process is also a hierarchical structure, and writers often refer back to their goals. As writers write, knowledge develops, and they create, retrieve, modify, and consolidate goals based on the discovery of new knowledge (Flower & Hayes).

The cognitive process theory of writing (Flower & Hayes, 1981) was consistent, fruitful, complex, middle-range (scope), and acceptable (Dudley-Brown, 1997). The theory was not accurate for the 21st century because it did not include the context's influence on writing. It was consistent because it had coherence with clear, logical connected terms and concepts. Flower and Hayes described their theory as fruitful because it revealed new phenomena, generated hypotheses, discussed ideas for potential research opportunities, and addressed essential issues related to the theory. The complex structure of the theory showed a hierarchical, in-depth look at the writing process. It portrayed writing as a hierarchical structure with multiple sub processes, concepts, and relationships.

Based on the substantive theory definition cited by Creswell (1994) and discussed by McEwen and Wills (2014), the cognitive process theory of writing was a middle-range theory because it is a model that can be tested. It was more descriptive, and provided an understanding of the phenomenon. Because of its number of citations and "circle of contagiousness" (Meleis, 1985, p. 159), it has been accepted by writing researchers. As of July 2015, the theory had 3,279 citations on Google Scholar. Further, it was useful because it can be applied to practice, education, and research. However, the theory did not meet the criteria of sociocultural utility because it did not include its transferability, its relationship to society, or its inclusion of community practices and their impact on the writing process. Although the cognitive process theory of writing has been the research base for several writing models, it is missing the inclusion of society's influence on the writing process. With the addition of social context, this theory could be stronger.

Social Cognitive Theory of Writing (Flower, 1994)

Flower (1994) called for an integration, especially in education, of social and cognitive theory in her book *The construction of negotiated meaning: A social cognitive theory of writing* because "neither social nor cognitive theory makes genuine sense without the other" (Flower, p. 33). Writing is a constructive process often shaped and carried out in a complex environment guided by the attitudes and feelings of not only the writer, but also the society and people who surround him or her (Flower). "The forces clustered around the poles of self and society, public and private, convention and invention, social and cognitive, [*sic*] are all forces that can give structure to a writer's meaning, guide composing, or set criteria …" (Flower, p. 34). This construction becomes moments of active meaning negotiation that causes the writer to deal with multiple forces while bringing meaning to a situation (Flower).

Flower (1994) contended that meaning is socially shaped through reproduction, conversation, and negotiation. Reproduction is one-way communication; whereas, conversation and negotiation are both dialogic processes. Knowledge production using reproduction is an unconscious process of text production (Flower). "New texts can be defined as a reconfiguration of prior texts" (Flower, p. 56) through the process of connecting previous meaning with new information to develop new meaning, which is an example of knowledge transformation (Bereiter & Scardamalia, 1987).

Constructing meaning in written conversation is shared knowledge with a community (Clark,

1990). Conversation is involvement (Brandt, 1990) that occurs through interaction (Flower, 1994). Partners in conversation use discussion and dialogue to construct meaning—at points clarifying where the conversation stands and agreeing to move forward. Meaning by conversation "draw[s] attention to a relatively undirected process, in which meaning is nourished, shaped, and expanded by existing within a stream of possibilities" (Flower, p. 65).

However, Flower (1994) postulated that meaning is best shaped through negotiation, and writers internally and externally negotiate meaning. "Negotiation draws our gaze to a dilemma-driven and goal[-]directed effort to construct meaning in the face of forces" (Flower, p. 66). In the presence of negotiated meaning, individuals are ready-to-share freethinkers with a unique understanding and conceptualization of information (Flower). The process of constructing negotiated meaning is influenced by outside forces (e.g., language, teachers, collaborators, discourse convention) and voices or knowledge (e.g., goals, constraints, opportunities, experiences, wisdom, conflict; Flower).

The social cognitive theory of writing (Flower, 1994) was accurate, consistent, fruitful, complex, middle range (scope), acceptable, and had sociocultural utility. The theory was important for writing research because it emphasized the role that society and community play in writing, as well as the role of cognitive processes in writing. Research studies have shown that writing and writing development are influenced by society and cognitive processes; however, theorists had failed to recognize such a relationship until Flower did so in 1994. Additionally, Flower presented a theory that was consistent, logical, and connected, as well as consistent in assumptions and propositions.

Flower's theory (1994) was fruitful because it revealed new phenomena, and the undocumented relationship between social context and cognitive processes in writing. It also examined the literature that led to its development, showed potential to solve problems, and provided ideas for further research. Flower claimed her theory was complex and described an intricate number of concepts, phenomena, and relationships in the theory. The theory was middle range (McEwen & Wills, 2014) because it covered a significant number of related concepts and facts. Additionally, the social cognitive theory of writing met the criteria of acceptability because, as of July 2015, it had been cited 521 times according to Google Scholar. It also had potential for usefulness in practice, education, and research paradigms. Lastly, the theory met the criteria for sociocultural utility because it represented a significant practice in society and had the potential to make an impact on society's writing education outcomes. The theory was transferable and consistent with the cultural values and beliefs systems within education.

Sociocultural Theory of Writing (Prior, 2006)

Early writing research related to cognitive processes was not representative of the complex intricacies of writing, so researchers began investigating the "social, historical, and political contexts of writing" (Prior, 2006, p. 54). Prior noted since this shift in the writing research paradigm, more empirical research has been conducted using the sociocultural theory approach. Sociocultural theory is not a new concept—it has complex interdisciplinary linkages that include diverse terms, concepts, and contexts (Prior).

Sociocultural theory contended that "activity is *situated* in concrete interactions that are simultaneously *improvised* locally and *meditated* by prefabricated, historically provided tools and practices" (Prior, 2006, p. 55). The mediated activity within the theory involves three elements: externalization through oral and written communication, co-action through collaboration with people and objects, and internalization through perception of reality and learning (Prior). During activity, people form institutions, and the world is personalized through their beliefs and values, which leads to a social-

ized and individuated individual (Prior). An iconic figure within sociocultural theory is Lev Vygotsky. His work "produced a rich set of studies, theories, methods, and goals for research" within the sociocultural theory paradigm (Prior). Additionally, Vygotsky has conducted research on childhood writing and on "ways that writing meditates problem solving and memory" (Prior, p. 55).

Writing, as a sociocultural approach, "involves dialogic processes of invention. Texts … are parts of streams of meditated, distributed, and multimodal activity" (Prior, p. 57). The individual writer participates in activities that extend beyond the individual (e.g., knowledge, distribution, reading). In a school setting, teachers are as much involved in the writing process as students are because teachers set deadlines and guidelines while simultaneously mentoring the students in the writing process (Prior). Using a sociocultural approach, learning to write, as explained by Daiute (2000), is "being socialized into a set of values, practices, and symbol systems" (p. 256), where the activities are group specific and not universal practices. Deane et al. (2008) said sociocultural stresses that "community practices deeply influence what sort of writing tasks will be undertaken, how they will be structured, and how they will be received, [which] emerge in specific social contexts and exist embedded within an entire complex of customs and expectations" (p. 13).

Sociocultural theory of writing has three themes: "redrawing the oral-literate divide, emerging schooled literacies, and writing in college and beyond" (Prior, 2006, p. 58). The oral-literate divide category focused on writing in the home and community, writing as an organized production, and the use of text in a social, purposeful, and contextual paradigm (Prior). Additionally, Prior stated that emerging schooled literacies is "a mode of participation in worlds of peer, group, school, and society" (p. 61), going beyond the home and community and defining writing as an even deeper sociocultural practice. Writing in college is much like emerging school literacies in that it focuses on the classroom practices. It is genre specific, and the genre is chosen by the teacher, students, discipline, and institution (Prior). "Writers [need] to continually learn new genres and textual practices" (p. 63) because of the complexity of literacy and the need to transfer knowledge and adapt to new situations (Prior).

The sociocultural theory of writing (Prior, 2006) was consistent, fruitful, simple, middle-range (scope), acceptable, and had sociocultural utility. It incorporated context and research base but failed to incorporate the cognitive processes and the writing process. Therefore, the theory is not accurate for the present-day writing paradigm. Prior's theory was, however, consistent because it was coherent and connected and used consistent terms, principles, and methods. The sociocultural theory of writing was fruitful because it had potential to generate hypothesis, examined the literature that led to its development, showed potential to solve problems, and provided ideas for further research.

Additionally, the sociocultural theory of writing (Prior, 2006) was a simple theory because it was easy to understand and brought order to individualized, isolated studies. It was a middle-range theory (McEwen & Wills, 2014) that covered writing in multiple contexts, from home to school to workplace, and was derived from the grand sociocultural theory and the literature. Additionally, Prior's sociocultural theory of writing met the criteria of acceptability because, as of July 2015, it had been cited 219 times according to Google Scholar. The theory has been influential in writing research and writing education research and has shown usefulness to practice, education, and research paradigms. Lastly, the theory met the criteria for sociocultural utility because it accounted for different contexts within the writing community (Prior). The theory is transferable and consistent with cultural values and beliefs systems. Overall, with more research, theory testing, and modifications to include a deeper understanding of the writing process, Prior's sociocultural theory of writing has potential to become a more broadly used theory in writing and writing education.

Of the three theories that were reviewed and evaluated, the Flower's (1994) social cognitive

theory of writing was the most complete. Its structure included both society's influence on writing as well as the cognitive processes involved in writing development. Each writing theory brought a unique perspective to writing research, but Flower's social cognitive theory of writing was a complete theory that incorporated an in-depth look at writing as a product of cognitive processes situated within society.

Discussion

Theoretical frameworks are important to the development of empirical research, but many definitions exist about what defines a theoretical framework, also noted by Camp in 2001. As Creswell (1994) stated, three levels of theories exist: grand, middle-ranging, and substantive. The different levels of theory play an important role in how theoretical frameworks are defined and used, ultimately impacting how they are applied in research and practice, which McEwen and Wills described in 2014.

The seven criteria proposed by Dudley-Brown (1997) provided a thorough framework for theory evaluation. Because a goal of any type of research should be to enhance and expand on theory, or to develop robust theory based on empirical research, theories need to be evaluated using a set of pragmatic and methodical evaluation criteria (e.g., Dudley-Brown). Because Dudley-Brown's evaluation criteria were founded in the nursing profession, and the nursing profession has roots in social science, it was logical to use her evaluation criteria in analyzing writing theories. The evaluation criteria were supported by a long-standing literature base (e.g., Kuhn, 1977; Laudan, 1977; Newton-Smith, 1981) and provided criteria descriptions that could be used to review and evaluate different levels of theories in a variety of contexts.

Since the 1980s, writing researchers have modified and adapted writing theories to better depict writing ideas, concepts, and relationships (Nystrand, 2006). Writing research has progressed from empirical research related to grammar and mechanics to the cognitive processes involved with writing and society's role in the writing process (Prior, 2006). Writing is situated within the social context of the writer and is impacted by communities of practice that occur as a part of the situated social context (Prior). Cognitive processes and social context are intricate pieces of writing theories that cannot be used alone to define writing. Flower (1994) intertwined the two domains when she introduced the social cognitive theory of writing, contending writing is constructed through a set of cognitive processes guided by society and/or social context. The cognitive process theory of writing (Flower & Hayes, 1981), social cognitive theory of writing (Flower), and sociocultural theory of writing (Prior) emerged as the most prominent writing theories of the last three decades.

The review and evaluation of prominent writing theories showed evidence that the frameworks were diverse in their description of writing ideas, concepts, and relationships; structure and level of theory (McEwen & Wills, 2014); and classification according to the four elements described by Raimes (1991). Each writing theory brought a unique perspective to writing research and represented writing during its respective era. Flower's (1994) social cognitive theory of writing was the most complete writing theory because it incorporated an in-depth look at writing as a product of cognitive processes situated in the society. "Neither social nor cognitive theory makes genuine sense without the other" (Flower, p. 33).

Recommendations and Implications

This review and evaluation of writing theories provides a basis for research, as well as practice, in agricultural communications. Reviewing the prominent writing theories sheds light on the exist-

ing theoretical frameworks in writing and provides researchers and practitioners a synopsis of three frameworks that could be used to advance the agricultural communications discipline. For writing research to be applicable in the 21st century, vigorous empirical research must be conducted because empirical research that investigates writing as a cognitive process guided by social context is limited (Prior, 2006). Therefore, more empirically sound writing theories that are exclusive to certain social contexts, such as the discourse communities within agriculture, should be developed to better understand writing as a cognitive process in specific social contexts.

Agricultural communicators know writing is necessary, but may not understand the theoretical underpinnings of writing and writing development. However, theoretical frameworks within the writing research paradigm have the potential to make substantial contributions to writing research, education, and practice in agricultural communications. Agricultural communications' researchers, educators, and practitioners should be open to change, adaption, and modification of writing theories and work continuously to make the frameworks more reliable, credible, and applicable in the profession. Many communication theories guide research and practice in agricultural communications, but few writing research studies or courses are grounded in a writing theory.

Regardless of how much research has been done on writing and the best ways to facilitate writing education, "the chilling truth is that we are no closer to knowing how to teach writing than we were at the beginning of the process movement" (Wallace et al., 2000, p. 93). The same is true for teaching writing in agricultural communications. Much of what exists in the literature about writing in agricultural communications is related to undergraduate competencies (Morgan, 2010, 2012; Morgan & Rucker, 2013; Sitton, Cartmell, & Sargent, 2005; Watson & Robertson, 2011), which does not inform the profession on how to teach writing. Moving from understanding what graduates need to succeed to understanding how to teach students what they need to succeed is important for the profession. Because theories "help develop or guide a program, through which aspects of the program itself are researched" (Kitchel & Ball, 2014, p. 186), those who teach writing in agricultural communications need to understand writing theories so that stronger writing programs can be designed.

Although writing is a creative skill that is often used to document stories in agriculture, researchers have not investigated how students use writing to create knowledge and develop into communicators who can tell the written story. Nystrand (2006) suggested writing should be investigated in all contexts; however, writing has not been investigated in all contexts related to agriculture. Using theory to teach writing courses may help students improve their cognitive process, knowledge creation, and ability to write effectively, improving the knowledge transformation process (Bereiter & Scardamalia, 1987). Understanding the relationship between text production and cognitive processes is a start to transforming writing education in agricultural communications and throughout the agricultural industry.

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Setting the Agenda: Exploring Florida Residents' Perceptions of Water Quality and Quantity Issues

Arthur Leal, Joy N. Rumble, and Alexa J. Lamm

Abstract

Water quantity and quality are among the top issues currently facing Florida. To understand residents' perceptions of these issues as well as understand how agenda-setting may be used to influence residents' behaviors and opinions surrounding water issues, this study explored Florida residents' opinions of water. Agenda-setting served as the conceptual framework to aid in understanding where water quality and quantity emerge on the public's agenda. Responses were obtained from 469 Florida residents via an online survey. The results showed respondents believed water quality had not changed, with the exception of the quality of bays, which they believed was getting worse. Water quality was found to be an issue of high importance among respondents, especially in regard to the quality of drinking water. Respondents believed water quantity was highly important; however, more importance was associated with water quality issues. The results of this study identified the current disconnect that exists among residents concerning water issues. This study also established the salience of water issues on the public's agenda and how Florida residents could be better informed. A statewide communication campaign focused on both water quality and quantity issues was recommended to decrease the disconnect that currently exists between residents' perceptions and the reality of water issues. This campaign should utilize the technology-based outlets to stay informed with the public's agenda to personalize communication efforts. These efforts would increase the public's interest concerning water issues by reducing redundant information and diluting important issues.

Key Words

Water, quality, quantity, agenda-setting, public opinion

Introduction

Water is essential for human life; each human being requires 1.5 liters of water daily to survive (Spellman, 1998). Water has become increasingly limited during the last 100 years and low water levels now threaten the American lifestyle (Araya & Kabakian, 2004; DeLorme, Hagen, & Stout, 2003; Spellman, 1998). Water supply has depleted in the United States since the 1900s with a four-fold increase in water usage but with no increase in rain and snow amounts (Spellman, 1998). In addition to decreased water supplies, agrochemical and urban runoff has threatened water quality and groundwater recharge in the southeastern (i.e., Florida, Georgia, and Alabama) United States (Workman, Bannister, & Nair, 2003). Several studies have shown fertilizer, crops, and runoff have decreased water quality in Florida since the mid-1950s (Finkl & Charlier, 2003; Weber & Perry, 2006). The convenience of water contributes to the public's disconnect with water shortages, and as-

surance of safe and palatable water (Stanford, 1996). Convenience and comfort are two factors that determine the public's engagement with conservation behaviors (Kollmuss & Agyeman, 2002). Not only has the short walk to the faucet contributed to the public's disconnect with water issues, but so has the convenience of paying bills. Whether it is automatic "bill-pay" or water costs included in a renter's monthly payment, residents have had limited exposure to costs associated with the amount of water they use (Stanford, 1996).

Rapid population growth has contributed largely to a decrease in existing water sources. Florida experienced a 64% population growth from 1980 to 2000, straining water resources (DeLorme et al., 2003). Water conservation involvement from the public has played a key role in the success and sustainability of water management programs, emphasizing the critical role the public plays in sustaining water resources (DeLorme et al., 2003). Water conservation efforts require individuals to give something up, rather than enjoy something, making water conservation campaigns challenging (Stanford, 1996; Syme, Nancarrow, & Seligman, 2000). While droughts often promote increased water conservation awareness, responses to a crisis are often temporary and short lived (Syme et al., 2000). Perceived as a public resource, some homeowners are willing to contribute to water conservation efforts; however, residents still lack consistent water conservation behaviors and fail to see their individual connection to the problem (DeLorme et al., 2003; Stanford, 1996).

Florida residents experienced extreme drought conditions in 2011 and most of 2012 (Pittman, 2012; Yeager, 2012). While Florida received mild relief with mid-summer rain, the drought's effects lingered until drought conditions resurfaced again in 2013 (Florida Weekly, 2013; Goldenberg, 2013; Marslender, 2013; Spear, 2013). Residents often become aware of water shortages as a response to shocking headlines: "Hefty Price Hikes for Fresh Food Amid Drought, Disease," "Proposed County Law Would Restrict Lawn Watering," and "A Fight Over Water, and to Save a Way of Life" (Alvarez, 2013; Curry, 2009; Stone, 2014). Individuals are not as likely to support environmental efforts unless the circumstances are under a negative context, carrying more weight than positive circumstances (Johnson & Scicchitano, 2000; Slovic, 1993). Therefore, the public is not as likely to support stricter environmental standards unless they view the situation as a problem (Johnson & Scicchitano, 2000).

Residents are increasingly interested in personal and environmental connections with water quality, but traditional methods (i.e., town meetings) of communicating about water issues have not reached large audiences (Stanford, 1996). However, ensuring some personal relevance with issues has the ability to encourage behavioral changes (Abbot, Policastro, Bruhn, Schaffner, & Byrd-Bredbenner, 2012; Petty, Barden, & Wheeler, 2009). Seymour and Bauske (2009) used workshops to inform university managers concerning water conservation. Participants in that study found workshops not only informative, but they reported a better understanding of how to address water conservation efforts. Additionally, areas like Denver, Colorado, have increased public awareness of water issues and water conservation efforts via the media (Stanford, 1996). While residents hold limited trust in popular media, the media still has the ability to raise a level of awareness of water issues (Merkel, Bicking, & Sekhar, 2012).

Like many states around the country, Florida has experienced many water quality and quantity hardships. Water quality of both fresh and salt water is a major concern for residents. Newspapers covered Florida's worst outbreak of red tide in 2012 and 2013, which stretched nearly 100 miles around the southwest coast of Florida. As a result, many Florida residents experienced substantial aquatic animal loss, which included the termination of more than 450 manatees within a three-month period (Flemming, 2013; Orlando Sentinel, 2012; Spinner, 2012). Florida drought conditions have increased awareness of the existing water quantity crisis (DeLorme et al., 2003; Stanford, 2006).

The public is more likely to consider water quantity an issue in drier areas of the United States or regions that have experienced frequent droughts (Borisova et al., 2013; Mahler, Simmons, Sorensen, & Miner, 2004). As Florida residents' travel around their communities, low-level lakes and ponds are reminders of water shortages (DeLorme et al. 2003). DeLorme et al. (2003) found central Florida residents have started to become conscious of their water usage and are implementing conservation strategies: water-efficient appliances, monitoring usage, and sprinkler timers. This level of awareness has not only included the amount and quality of outdoor water available to residents, but also it has extended to the quality of water being used in homes.

Many residents are skeptical and fear potential contaminants in drinking water. In a study conducted by Mahler et al. (2004) in the Pacific Northwest, 99% of the respondents considered clean drinking water the most important water priority. With not only their personal health in mind, parents want to ensure their families are safe from radiation, bacteria, parasites, and other harmful contaminants (Araya & Kabakian, 2004; Hu, Morton, & Mahler, 2011; Merkel et al., 2012). Unfortunately, Mahler, Simmons, and Sorensen (2005) found many residents do not have adequate knowledge to evaluate potential water pollutants. Instead, residents use color, taste, and odor as key indicators of poor water quality (Doria, 2010). DeLorme et al. (2003) found residents' connection with water quality stems "more from firsthand sensory information than from mass media or interpersonal interaction" (p. 30).

A non-mutual sense of urgency exists between water providers and residents. More often than not, residents have complained about the aesthetic qualities of their tap water, and water providers have dismissed those concerns with the notion they are unimportant (Saylor et al. 2011; Stanford, 1996). With their concerns being ignored, residents believe their tap water is not safe for consumption and have resorted to alternative sources of water: bottled water, water purification systems, Brita® filters, and machine distiller and purifiers (DeLorme et al., 2003; Hu et al., 2011). An organization that frequently addresses issues like water found "73% of the people in the United States believe government investment in safe, public water is either extremely or very important" (Corporate Accountability International, 2012, p. 3). Improvements to assure the availability of safe public water can be undermined when residents purchase alternative sources of water (i.e., filters, bottled water, etc.) instead of using public tap water (Hu et al., 2011).

As water quality and quantity issues continue to be a problem, communicating with residents is vital. While some Florida residents participate in various conservation practices, many forgo conservation efforts because they lack the knowledge to address these issues (DeLorme et al., 2003). It is often unclear water conservation efforts include recreational and household activities. Efforts must go beyond conservation awareness and reinforce Florida homeowners' contribution to the water conservation problem (DeLorme et al., 2003). Lambright, Chjangnon, and Harvey (1996) found environmentally conscious cities become more active with increased involvement and importance placed on environmental issues from environmental groups, influential proponents, and governmental agendas. A balance between opinions and knowledge serves as a credible tool in communicating important messages that require residents to change behaviors (Lambright et al., 1996).

This study sought to better understand Florida residents' perceptions of water quality and quantity issues to identify the public agenda on water issues. Effective communication and education efforts can address concerns and misconceptions through identification of public perception of water quality and quantity issues.

Conceptual Framework

Agenda-setting served as the conceptual framework for this study. Nearly 45 years old, agenda-setting has been used in multiple disciplines and countries, enabling more than 300 studies to identify its effects and help ground this framework (Stone, Singletary, & Richmond, 1999). Agenda-setting has been studied for many years to capture how media create the basis for everyday public discussion, allowing media the opportunity to create and even swing public opinion (Baldwin, Perry, & Moffitt, 2004). By reporting what issues are seen as important and focusing attention on certain issues, media are able to limit the extent of what the public thinks about (McCombs & Shaw, 1972). A three-part process, agenda-setting stems from the media agenda, which influences the public agenda and that ultimately affects the policy agenda (Littlejohn & Foss, 2011). Several current opinions and concerns regarding national issues exist among the public, referred to as the public's agenda, and have been shown to closely mirror the media's agenda (Stone et al., 1999). While media and public agendas commonly overlap, their interdependence has also been emphasized, suggesting a causal relationship between the two (Stone et al., 1999). McCombs and Shaw (1972) found the media agenda appeared to precede the public agenda, which would suggest the media agenda might set the public agenda (Stone et al., 1999). This relationship has been debated among social scientists for many years in an effort to understand the complexities between the two agendas (Uscinski, 2009).

While the public agenda and media agenda are not expected to always mirror one another (Stone et al., 1999), research has shown the influence the public agenda might have on the media agenda (Littlejohn & Foss, 2011). Much of what the media reports on is determined by its newsworthiness, and some important issues may be ignored on that basis. Moreover, public demand has been shown to control newsworthiness. The public has a role in shaping the salience of certain issues — environmental issues included — ultimately influencing the media's agenda (Uscinski, 2009). The public's power to influence the salience of issues has also been balanced by technology. Technology has aided the public in creating additional outlets for setting the news agenda and providing greater freedom to the public in determining what is important. The media agenda has a habit of ambiguously reporting on recurring issues, diluting its affect on the public and limiting its ability to keep the conversation going (Protess, 1987). Traditional media outlets (i.e., newspapers, television, etc.) have the ability to start the conversation, but public-controlled outlets (i.e., blogs, forums, etc.) have the ability to help the conversation last (Meraz, 2009). Scheufele (2000) referred to agenda-setting as an "inherently casual theory" (p. 304), and no matter which agenda is dependent upon the other, positive correlations between the public and media agenda have been observed.

Shiffman (2007) explained many factors contribute to an issue making it on the policy agenda. Whether or not the issue is highlighted and receives visibility (i.e., crises, conferences, and discoveries), affects its ability to be placed on the policy agenda and acted upon. The public's activity level with environmental issues, including water quality and quantity issues, varies around the United States. Larger cities tend to be more environmentally conscious, which can increase the number of environmental groups lobbying for water issues to be placed on the public's agenda (Lambright et al., 1996). DeLorme et al. (2003) found central Florida residents believed the water crisis was a serious, complex problem that should be a part of the political, economic, and social agendas. Only at the point of crises, when a situation is visible or apparent, does the public become concerned, triggering the need for agenda-setting, though at a high cost (Graffy, 2006; Syme et al., 2000). When the governmental agenda and public agenda's reflect concern for the environment, communities are more likely to become environmentally active (Lambright et al., 2006). Agenda-setting served to guide this study to better understand the salience of water quality and quantity issues on the public's agenda.

Purpose

This study sought to explore Florida residents' perceptions of water issues, seeking to gain a better understanding of the public's agenda on water issues. Researchers assessed the level of importance Florida residents place on water quality and quantity. This study was guided by the following research objectives:

1. Describe the opinions Florida residents have about changes in water quality.
2. Describe the level of importance Florida residents associate with water quality issues.
3. Describe level of importance Florida residents associate with water quantity issues.

Methods

Florida residents, 18 and older, were the population of interest for this study. Respondents were limited to Florida residents because water was a high priority issue facing Florida at the time of the study. To fulfill the research objectives, an online survey was used to collect data.

The survey instrument used in this study was adapted from the 2012 RBC Canadian Water Attitudes Study (Patterson, 2012). The data used in this survey was part of a larger study; however, only two sections of the instrument were used to address the objectives for this study: importance of water quality and quantity as well as the opinions of the change in water quality. Four individuals with expertise in water quality and quantity, public opinion research, and survey design served on the panel of experts, ensuring content and face validity of the survey instrument (Ary, Jacobs, & Sorensen, 2010).

Respondents were asked to indicate their opinions concerning several water-related sources on a four-item Likert-type scale and indicate whether the water quality of the sources presented were 1 = *Better*, 2 = *No Change*, 3 = *Worse*, and 4 = *Unsure*. This was used to measure respondents' opinions of the change in water quality. A seven-item Likert-type scale was used to measure the importance of water quality. The same scale was used to measure seven items addressing water quantity. Both of these scales ranged from 1 = *Extremely Important*, 2 = *Highly Important*, 3 = *Fairly Important*, 4 = *Slightly Important*, and 5 = *Not at all Important*.

A total of 516 representative Florida residents were sent the survey link. Of those 516, 469 responded. Thus, a 90.9% response rate was achieved. The 2010 U.S. Census data for Florida were used to weight the demographic characteristics of the respondents to be reflective of the Florida population (Baker et al., 2013). Data for each research objective were analyzed using SPSS ® 21.0. Descriptive analyses were used to calculate respondents' opinions of the change in water quality and to evaluate respondents' level of importance placed on various water quality and quantity items.

A public opinion research company recruited respondents through non-probability opt-in procedures. Non-probability samples are a common sampling method for public opinion research as they allow for population estimates (Baker et al., 2013). Non-probability samples are known to have limitations associated with selection, exclusion, and non-participation biases (Baker et al., 2013). To overcome these potential limitations, post-stratification weighting methods were used (Kalton & Flores-Cervantes, 2003). The demographics weighted in this study included gender, race, ethnicity, age, and community size using the rural urban continuum coding system (United States Department of Agriculture Economic Research Service, 2013).

After demographic weighting was completed, a descriptive analysis of the demographic data was completed (see Table 1). The respondents included 240 (51.1%) females and 229 (48.9%) males. There were primarily Caucasian/White (Non–Hispanic; 77.1%, *n* = 362) respondents. Hispanics represented 22.5% (*n* = 106) of the respondents, while African Americans included 17% (*n* = 80) of

the respondents. Just more than half of the respondents were between the ages of 20 and 59 (52.7%, *n* = 247) and 93.6% (*n* = 450) resided in metropolitan counties.

Table 1
Weighted Demographics of Respondents

Characteristic	*n*	%
Gender		
Female	240	51.1
Male	229	48.9
Race		
African American	17	17.0
Asian	14	3.0
Caucasian/White (Non–Hispanic)	362	77.1
Native American	1	0.2
Hispanic Ethnicity	106	22.5
Age		
18 - 29	66	14.1
30-39	57	12.2
40-49	67	14.2
50-59	63	13.5
60-69	52	11.1
70-79	35	7.4
80 and older	23	4.9
Rural-Urban Continuum Code Classification		
1 million or more metropolitan area	296	63.1
250,000 to 1 million metropolitan area	121	25.7
Few than 250,000 metropolitan area	23	4.8
20,000 or more, non-metro area	16	3.5
2,500 to 19,999 non-metro area	12	2.6
<2,500 completely rural non-metro area	1	0.3
Political Affiliation		
Republican	113	24.3
Democrat	188	40.7
Independent	142	30.6
Other	20	4.3

Results
Describe the Opinion Florida Residents Have About Changes in Water Quality

Respondents were asked whether or not they believed the quality of various water sources was getting better, worse, had no change, or if they were unsure (see Table 2). Overall, respondents believed the water quality had not changed in almost all of the water sources examined. The only exception was that 34.4% (*n* = 162) of the respondents believed the water quality of bays was getting *worse*, making worse the highest selection for this water source.

Table 2
Respondents' perceptions of water quality

	Better		No Change		Worse		Unsure	
	n	%	n	%	n	%	n	%
Springs	84	17.9	200	42.7	88	18.9	96	20.6
Estuaries	50	10.8	175	37.4	117	25.0	125	26.7
Groundwater	62	13.1	175	37.2	136	29.1	96	20.4
Lakes	56	11.9	172	36.6	154	32.8	82	17.5
Rivers	71	15.1	166	35.5	149	31.7	81	17.2
Oceans	69	14.6	164	35.0	159	33.9	77	16.5
Bays	63	13.4	153	32.6	162	34.4	90	19.2

Describe the Level of Importance Florida Residents Associate with Water Quality Issues

Respondents were asked to rate the level of importance they associated with the quality of seven water sources (see Table 3). Overall, respondents believed the water quality in all water sources was either *highly* or *extremely important*. Drinking (*n* = 385, 82%) water quality was afforded the highest level of importance, with 65.7% (*n* = 308) of respondents deeming the quality of ground water as the second highest important water source. Beaches (*n* = 307, 65.4%) were also rated as *highly important* among respondents. Additionally, respondents believed the water quality for shell fishing (*n* = 273, 58.2%) was the least important of all water sources assessed.

Table 3
Level of importance associated with water quality

	Extremely Important		Highly Important		Fairly Important		Slightly Important		Not at all Important	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Drinking	385	82.0	51	11.0	19	3.9	6	1.2	1	0.2
Groundwater	308	65.7	105	22.4	37	7.8	5	1.1	7	1.4
Beaches	307	65.4	118	25.1	28	6.0	9	1.8	4	0.8
Lakes	300	64.0	117	24.9	41	8.8	4	0.9	1	0.2
Oceans	287	61.2	132	28.1	36	7.7	6	1.4	2	0.4
Estuaries	284	60.7	133	28.4	35	7.5	8	1.6	2	0.5
Shell fishing	273	58.2	122	26.0	46	9.8	14	3.1	4	0.9

Describe the Level of Importance Florida Residents Associate with Water Quantity Issues

Respondents were asked to indicate the level of importance they associated with the amount of water available for different activities (see Table 4). Overall, respondents believed water quantity in all water sources was either *highly* or *extremely important*. Respondents believed the amount of water afforded for agricultur*e* (*n* = 300, 63.9%) and recreation (*n* = 293, 62.5%) were the most important of the activities assessed. Respondents placed the lowest level of importance with water needed for aquifers, springs, and rivers (*n* = 165, 35.3%) as well as landscapes (*n* = 172, 36.6%).

Table 4
Level of importance associated with water quantity

	Extremely Important		Highly Important		Fairly Important		Slightly Important		Not at all Important	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Agriculture	300	63.9	116	24.7	36	7.6	7	1.5	2	0.5
Recreation	293	62.5	111	23.6	38	8.2	13	2.8	5	1.1
Golf Courses	269	57.4	128	27.4	50	10.8	11	2.4	3	0.7
Commerce	233	47.5	155	33.0	64	13.7	15	3.2	6	1.3
Cities	186	39.6	113	24.2	78	16.6	31	6.6	11	2.4
Landscapes	172	36.6	113	24.1	110	23.5	49	10.5	20	4.2
Aquifers, Springs and Rivers	165	35.3	149	31.8	100	21.3	33	7.1	10	2.2

Discussion

This study sought to assess Florida residents' awareness of water quality and quantity issues. The first research objective assessed whether or not Florida residents observed changes in water quality. Respondents appeared to observe little *change* overall of the seven water sources assessed. However, 34.4% (*n* = 162) of respondents believed the water quality of bays was becoming the worst, making *worse* the highest selection for this water source. While no direct connection can be made, the media's agenda reflected strong concern for the impact of red tide on the southwest coast line of Florida, as there was severe aquamarine life loss (Flemming, 2013; Orlando Sentinel, 2012; Spinner, 2012). These events occurred during data collection for this study, which may have had an affect on the public's agenda at the time. Additionally, DeLorme et al. (2003) found similar results with residents sharing a concern of decreased outdoor water quality. Red tide has been a constant battle for the state of Florida, and several studies referenced cases of its impact from 1995 to 2005 (Goodnough, 2005; Morgan & Larkin, 2006). DeLorme et al. (2003) and this study appear to have experienced similar events with red tide while each study was conducted, and Florida residents in both studies shared relatively similar views of outdoor water quality. This appears to show some type of pattern with both the media's and public's agenda reflecting concern for Florida water.

There appears to be a slight disconnect with Florida residents' perception in the quality change of their drinking water. Respondents indicated there was *no change* in the quality of groundwater, which is a major source of drinking water. However, several studies have shown the Florida water quality has decreased due to fertilizers, crops, and runoff (Finkl & Charlier, 2003; Weber & Perry, 2006). Florida residents in DeLorme et al.'s (2003) study were generally dissatisfied with their household water quality. Several factors might contribute to respondents' perceptions of the change in water quality; community size can be a contributing factor to residents' perceptions of drinking water (Hu et al., 2011). Water quality may also vary around the state of Florida as residents use alternative methods of substituting poor water quality (i.e., water bottles, filter systems, purifiers, etc.; DeLorme et al., 2003; Hu et al., 2011). Mahler et al. (2005) suggested residents do not have an adequate

amount of knowledge to evaluate their water quality effectively. As a result, the public might not be aware of the current water quality issues, potentially contributing to a disconnect between their perception and reality as well as a general lack of awareness on behalf of the public. This finding suggests the salience of water quality issues is not appropriately represented on the public's agenda, and its importance will not be reflected until the public is better informed.

This study also examined the level of importance Florida residents associated with the water quality of several water sources. The findings supported the notion that respondents assigned high levels of importance to drinking water quality. Mahler et al. (2004) found similar results with respondents affording the highest priority to drinking water quality. DeLorme et al. (2003) also found that central Florida residents were conscious of drinking water quality, which indicated residents are aware of drinking water safety (Hu et al., 2011). Merkel et al.'s (2012) study also found that water quality safety (i.e. water free from parasites, radiation, and illness causing contaminates) was a primary concern. While respondents assigned the highest level of importance to drinking water in this study, groundwater (the primary source of drinking water) was afforded the fourth highest level of importance. This finding indicates that participants possess some confusion regarding the source of their drinking water. As weather patterns change and surface water is depleted, there will be an increased dependency on groundwater. Unfortunately, groundwater supply is also becoming depleted, which will require new behavioral changes (Spellman, 1996).

Respondents also assigned the second highest level of importance to the water quality of beaches, while oceans were designated with the fifth highest level of importance. Serving as another interesting finding, beaches and oceans embody the same water source. One explanation might be the accessibility of beaches and the ocean. The public commonly visits beaches for various reasons, as they are normally accessible to everyone. For several individuals, beaches are a car ride or short walk away from their homes. However, traveling out to the ocean requires additional transportation (i.e., boats, etc.) and those are not necessarily accessible to everyone. While no definite conclusion can be made from the inconsistent importance placed on like water sources, these findings display some level of disconnect in knowledge or awareness.

The last research question focused on participants' perceived importance associated with the quantity of several water activities. Overall, respondents assigned a high level of importance in allocating water for all water sources. Participants indicated the highest level of importance with water needed for agriculture and recreation. Mahler et al. (2004) reported similar results with 84% of respondents indicating the amount of water for agriculture as a high priority. Agriculture and forestry serve as a major contributor to the Florida economy, second only to tourism (Workman et al., 2003). Similarly, Mahler et al. (2004) found a connection with cultural and economic importance afforded to particular water issues. While no direct correlation can be made from the data in this study, there does appear to be some connection between allocation of water and state economy.

Consistent with DeLorme et al. (2003), respondents in this study indicated a high level of importance associated with the amount of water available for recreation. While respondents in this study attributed a high level of importance to the amount of water in cities, with consideration for the decrease in the current water supply (Spellman, 1998), city water quantity might have been expected to rate higher among respondents. The level of importance for recreational water uses appeared to compete with water sources that are required for human survival. Serving as a central hub in supplying water to large populations, the level of importance for the amount of water in cities rated fifth among the sources assessed. Additionally, Florida was surrounded by extreme drought conditions during the time of this survey. Several newspaper articles indicated the drought was get-

ting worse and utility companies were uniting to attempt to prevent water supplies from dissipating (Florida Weekly, 2013; Goldenberg, 2013; Marslender, 2013; Pittman, 2012; Spear, 2013; Yeager, 2012). While the media's agenda appeared to reflect concern, the public's agenda appeared to focus elsewhere. It seems water for recreation might overshadow or compete with the need for water in areas of higher population in this study. The convenience and availability of drinking water might explain the decreased importance of quantity respondents afforded to heavier populated areas in this study (i.e., cities) (DeLorme, et al., 2003; Stanford, 1996). Droughts and the current water crisis have only restricted outdoor water usage. Residents have not experienced indoor water restrictions, which might explain the lower importance associated with the amount of water needed for cities.

Recommendations
Practice
While respondents in this study displayed inconsistent perceptions of like water sources (i.e., beaches and oceans, and drinking and groundwater), and reflected different opinions examined in previous research (DeLorme et al., 2003), a series of awareness campaigns addressing water sources may be beneficial. In a time when environmental issues and concerns are being publicly addressed (i.e., recycling, energy efficiency, etc.), a campaign should use the current environmental efforts being pursued and address water issues. In particular, based on the results of this study, a statewide communication campaign could increase awareness of water issues in general, but also it could hone in on particular areas where public knowledge is lacking and reduce the disconnect that currently exists. Research has shown the public's ability to influence the media's agenda (Uscinski, 2009). The public uses many technology-based outlets to indicate what is important to them (Meraz, 2009), and this is a way for communication campaigns to stay informed and personalize efforts to the public. Personal relevance has a stronger chance in influencing the public's agenda. At the time of this study, media appeared to be reporting on the impacts of red tide and droughts, but respondents only showed awareness of the issues that existed with water for recreation, and less concern for the amount of water for drinking. Communication campaigns should focus their efforts to address the quality of drinking water, as this study found the majority of respondents felt there was no change in the groundwater quality. Conversely, several studies have shown the public to exhibit concerns regarding the quality of water around the United States for various reasons (DeLorme et al., 2003; Hu et al., 2011; Saylor et al., 2011; Stanford, 1996), and other studies have shown the water quality in Florida to be decreasing (Finkl & Charlier, 2003; Weber & Perry, 2006). A campaign should also determine methods of increasing general knowledge of water sources, as respondents displayed some confusion about where water comes from and failed to make a connection between like water sources. With interest from residents to learn more about water issues, information could be provided to Florida residents to help them better understand their role in preserving water.

By using research results to target specific areas that have been identified as areas of disconnect, unnecessary efforts would be limited and redundant information could be reduced. This could increase public interest by preventing the dilution of important issues (Protess, 1987). Campaigns would also serve as a proactive approach to water issues and increase the impact of those efforts, which was established Syme et al. (2000). Agenda-setting served as the guiding conceptual framework in this study. Studies have shown once issues like water are placed on the agenda (i.e., media agenda) and awareness of issues increases, the more likely individuals are to take action and reflect similar views on the issue (Lambright et al., 2006; Mazarr, 2007; Shiffman, 2007). A more active role from governmental and influential proponents driving the media agenda and public agenda have the

ability to increase local and national awareness, further emphasizing the need for communicators to deliver this information to policy makers.

The findings in this study illustrate the need for increased consideration for the public's agenda by the Florida governmental agenda concerning water issues. Communication channels need to be opened between policy makers and communicators conducting research regarding consumer perceptions of water issues. The communication channels would allow constituents' views to be known and provide policy makers guidance in creating and revising current policies that address pressing state problems. How experts go about addressing these priorities will determine how issues are publicly "introduced, understood, and acted upon within the public agenda" (Graffy, 2006, p. 466), providing the opportunity to address misconceptions and further understanding of current water issues. These efforts would also allow governmental officials to better understand water issues that may exist in different areas of Florida, allowing the governmental agenda to address concerns that are more reflective of Florida residents as a whole, versus residents from selected areas.

The results from this study show a high level of importance for water quality, but display a lack of concern regarding the amount of water (quantity) available on the public's agenda, which is known to affect legislation, demonstrating the need for policy makers to focus the political agenda around the availability of water (Stone et al., 1990). With minimal regulations in the amount of water residents can use, aside from drought conditions when little water is available, such an effort might meet some resistance or skepticism. However, the consequences of not proactively addressing these issues has the potential to be much more severe in the event water use is limited due to a nationwide depletion. Until the public agenda and political agenda reflect this concern, water quantity and quality issues will not be seen as reality, and little will be done to address this issue; this also draws attention for more research to be conducted on water quantity issues (Lambright et al., 2006).

Future Research

A limited number of studies exist addressing water quantity issues in social sciences. The majority of the current research focuses on water quality issues with limited information concerning water quantity and consumer knowledge and perception of water quantity issues. However, it appears there are major water quantity issues that exist around the state of Florida, which have the potential to severely impact residents. In an effort to increase awareness and knowledge of water quantity issues, the research agenda must reflect a more balanced analysis on this topic. This will accurately serve communicators and policy makers when making important decisions.

While this study was limited to the state of Florida, future studies could assess perceptions of water quality and quantity on a national level. Several studies around the nation have reported a decrease in the quality of drinking water (Hu et al., 2011; Merkel et al., 2012), and the media appears to be addressing water quality issues around the United States as well. Future studies could also evaluate state comparisons, not only noting differences among different states but also different regions in the United States (i.e., rural versus urban, population, etc.). Research also could benefit from assessing the salience of water issues on the media's agenda, which would also provide a better understanding of the results in this study. As water quality and quantity issues become a growing issue, increased involvement and awareness will have to be implemented on many levels.

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Fitting Farm Safety into Risk Communications Teaching, Research and Practice

Jim Evans and Scott Heiberger

Abstract

New safety challenges are emerging as agriculture evolves within the complexity of serving a growing world population. The nation's most hazardous industry is struggling to provide safe working environments in the face of demographic changes in the agricultural work force, new technologies, new kinds of enterprises, pushback against regulation, and other forces. Such changes introduce new forms of occupational risk and create greater need for appropriate safety communications. This study examined potentials for improving engagement of the agricultural media, which serve as primary information channels for farmers. Those who teach agricultural communications are key gatekeepers in preparing skilled professional agricultural journalists and other agricultural communicators. Therefore, the study focused on potentials for strengthening skills in farm safety communications through teaching programs in agricultural journalism and communications. The second and related purpose involved advancing understanding of conceptual linkages between farm safety communications and risk communications, using a safety-oriented framework of risk communications. A mixed methods research design involved quantitative and qualitative approaches using an online survey among faculty representatives in 23 agricultural communications programs at universities throughout the nation. Responses identified encouraging potentials and useful direction for integrating farm safety into agricultural communications courses. Findings also shed helpful light on conceptual linkages between risk communications and a seemingly "lost cousin" — farm safety communications. They pointed to new potentials for agricultural communications teaching and scholarship in strengthening connections between theory and practice in risk communications (including farm safety communications) related to agriculture.

Key Words

Farm safety, risk communications, agricultural communications, communications education, courses

Introduction

Safety in farming faces serious and growing challenges in human and financial terms. Agriculture has the highest rate of occupational death across all U.S. industries — 22.2 fatalities per 100,000 workers — ranking it ahead of transportation, mining, and construction (U.S. Department of Labor,

2014). The annual cost of occupational injuries in agriculture is $8.3 billion in medical costs and lost productivity, with a typical cost of $1 million for one tractor overturn (Agricultural Safety & Health Council of America, 2014). About every three days, a child dies in an agriculture-related incident (National Children's Center, 2013).

Furthermore, new safety challenges are emerging as agriculture evolves dramatically. For example, demographics of the agricultural workforce are changing rapidly, along with scales of operation, types of farming enterprises (such as agritourism, organic farming, biomass production, and other niche enterprises), and specialized equipment and technologies (as with precision farming and unpiloted aerial vehicles). Each change introduces new safety challenges and new communications challenges. Also, proposals and changes in safety regulations generate a need for improved communications among and with farmers (Heiberger, 2012). Such changes call for greater diversity of safety information and new ways to deliver it (Murphy & Lee, 2009). This need for improved communicating about safety serves as the foundation for two companion purposes of research reported here.

Purpose 1. Assess the potential for using teaching programs in agricultural journalism and agricultural communications to improve practices for effectively communicating about farm safety through agricultural media.

Several factors prompt interest in assessing the status and potential of teaching farm safety communications within agricultural communications programs at U.S. colleges and universities.

Agricultural media offer exceptional potential for helping improve the safety of practices and conditions on farm and ranches. Farmers use a wide range of sources and channels for gathering agricultural information. Readex Research in 2012 analyzed use of 15 channels by a national sample of U.S. farmers and ranchers. Eighty-two percent reported reading agricultural magazines and newspapers at least weekly. Fifty-two percent reported using digital agricultural media at least weekly, with websites and e-newsletters most common (Agri Council of American Business Media, 2012). Farm broadcasters provide current market information, weather, and agricultural news on more than 1,300 stations nationwide. A 2014 survey by Ipsos Research among U.S. farmers and ranchers revealed 84% reported finding their local farm broadcaster and farm news information important in their daily operation decisions (National Association of Farm Broadcasting, 2015).

Within all those media, professional agricultural journalists select, gather, and process the editorial content. Other communicators, who specialize in agricultural public relations and marketing communications, plan and prepare advertisements and other information about products and services available to producers.

Universities serve as major education providers for such agricultural journalists and communicators. During 2011 nearly 1,500 undergraduate students were enrolled in agricultural journalism/communications degree programs at U.S. land-grant universities. More than 130 students were enrolled in master's and doctoral programs (U.S. Department of Agriculture, 2011). Those who teach agricultural communications courses are key gatekeepers (Shoemaker, 1996) for grooming professional agricultural journalists and communicators. They also are important in teaching communications skills and insights to students who are not preparing to be professional journalists or communicators but who will communicate in all sectors of agriculture.

It would, therefore, seem such programs represent a promising response to the question "Where is the education and training to come from?" posed by two leaders of the Agricultural Safety and Health Council of America (ASHCA) in a 2009 issue of the Journal of Agricultural Safety and

Health. Murphy and Lee highlighted nine critical issues that undergird support, motivation, and effort for safety in the nation's dynamic agriculture sector. They cited weak and dwindling support for farm safety and health in Cooperative Extension programs, farm legislation, state agencies, and commodity groups. They emphasized critical need for better connections between agricultural cooperatives, insurance companies, farm and ranch suppliers, and support services to professional safety and health organizations and societies (p. 205).

Communicating through media about safety is not easy (Ozegovic & Voaklander, 2011; Pedler, 2006). However, research reveals strong potentials for effective teaching and learning about agricultural safety and health through efforts that involve media and other means (Covitt, Gomez-Schmidt, & Zint, 2005; Miller, Schwab, & Peterson, 1994; Teran, Strochlic, Bush, Baker, & Meyers, 2008).

Purpose 2: Examine conceptual linkages between farm safety communications and risk communications, with an eye on identifying ways to strengthen theory and practice in both areas.

Simon, Robertson, and Doerfert (2003) called attention to the need for strengthening linkages in their report, "The inclusion of risk communications in the agricultural communications curriculum." They cited evidence of a gap between the theory and practice of risk communications and the practices of agricultural communications professionals in dealing with a growing menu of issues that involve communicating about risks.

Similar evidence of need emerged from an ad hoc committee of agricultural communications faculty members at eight universities in the southern region of the United States. Risk communications strategies ranked second among the five priority research themes identified. The committee emphasized need for greater understanding of factors that influence risk perceptions and effects of risk communications methods with respect to agricultural products, processes, and technologies (Agricultural communications research priorities, 2003). Indeed, risk communications is, "an extremely important aspect of communication practice" (Telg, 2010, p. 1).

It is noteworthy that interest in risk communications involving agriculture has focused on consumer and public safety more than farm safety. An analysis in the Agricultural Communications Documentation Center at the University of Illinois revealed nearly 1,900 documents about risk communications related to food, farming, natural resources, renewable energy, and other dimensions of agriculture. Those reports trace back more than a century, exploring hundreds of issues that have emerged and changed over time. Examples include the relationship between advertising and pure food legislation (Pierce, 1911); health effects of tobacco and smoking (Cigarette smoker study, 1961); healthfulness of dairy products (Role of diet in heart disease, 1965); use of pesticides (Celebrity pesticide spots, 1968; Harmer, 1971; Salcedo, Evans, & Read, 1971; Whelan & Stare, 1975); safety of meat (Unfounded claims against meat, 1974); routine feeding of antibiotics to livestock (The antibiotics controversy, 1985); irradiation of food (Food is split over irradiation, 1985); artificial sweeteners (Lawler, 1986); use of nanotechnology in food and agriculture (Pense & Cutcliffe, 2007); the portrayal of lean, finely textured beef as "pink slime" (Sellnow & Sellnow, 2014); and dozens of others.

Relatively little reference to risk communications involves occupational risks and safety of farmers/ranchers and their families, farm workers, and others in production agriculture. Farm safety communications has a long tradition, predating much of the current emphasis on risk communications. In fact, the advent of World War II led to the emergence and evolution of a nationwide farm safety movement in the United States. The movement engaged government agencies at all levels as well as universities, agribusinesses, youth organizations, rural groups, and other partners. Oden's research

about this movement from 1940 to 1975 tracked a revolution of technologies and practices on farms and ranches. He observed the blessings of technology sometimes have been mixed, as each advance has also brought a new potential for injury (Oden, 2005, p. 421).

Whereas the traditions of farm safety communications and risk communications have developed quite separately, they would seem to share conceptual roots worthy of attention. The study reported here seeks to add understanding and meaning to the shared elements. It does so by using a safety-oriented conceptual framework identified by Lundgren & McMakin (1998). In their book, Risk Communication, they organized risk communications along three functional lines.

- Care communication. This form is preventive in nature and purpose. It seeks to inform and advise the audience about safety and health risks in the workplace.
- Consensus communication. This form of risk communication involves safety planning. It seeks to inform and encourage groups to work together to reach a decision about how the risk will be managed (prevented or mitigated). It also is a subset of stakeholder participation, which encourages all those with an interest (stake) in how the risk is managed to be involved in building consensus.
- Crisis communication is risk communication in the face of extreme, sudden danger. It can include communication before, during, and after a major emergency.

These three dimensions serve as touch points for using the study reported here to examine conceptual linkages between farm safety communications and risk communications.

Goals of the study reported here are consistent with the National Occupational Research Agenda (NORA) for Occupational Safety and Health Research and Practice in the U.S. Agriculture, Forestry, and Fishing Sector (NORA, 2008). NORA Strategic Goal 3, in particular, addresses "Outreach, Communications and Partnerships." This study also fits within Priority 5 of the National Research Agenda for Agricultural Education and Communication Programs, 2011-2015. Priority 5 involves efficient and effective agricultural education and communications programs. In terms of this study, it emphasizes research focus on seeking and demonstrating effective integration of communications and the safety dimensions of agricultural sciences (Doerfert, 2011).

Research Questions

This research focused on those key gatekeepers — faculty members — who teach agricultural journalism/communications courses and advise future professionals at universities throughout the nation. In support of the identified purposes, it involved five research questions:

RQ 1. What are faculty members' perceptions about (A) the relative importance of farm safety, (B) the effectiveness of communications with farmers, farm families and farm workers about occupational safety, and (C) the extent to which coverage of farm safety requires special reporting skills?

RQ 2. How extensively is farm safety addressed in existing agricultural communications courses?

RQ 3. To what extent are those who teach agricultural communications courses interested in using educational resources about farm safety communications?

RQ 4. In what topics are they most interested, and in what form(s) might they welcome and use educational resources about farm safety communications?

RQ 5. What conceptual linkages, if any, do their responses reveal between farm safety communications and risk communications?

Methods

A mixed methods survey research design was used with a combination of quantitative and qualitative approaches. Specifically, an online survey methodology was chosen with an explanatory design that used qualitative responses to explain quantitative results in selected parts of the survey instrument. This design was chosen to provide a better understanding of the research problem than through either the quantitative or qualitative approach alone (Creswell & Plano-Clark, 2007).

Participants in the survey represented U.S. universities that offer identified majors, options, or concentrations in agricultural journalism or agricultural communications. Investigators chose to seek information through a census or near-census of all of such programs in the nation. Thirty-five programs were identified through organizational directories, university and other websites, research reports, correspondence, and other means. One faculty member from each university was selected to participate. In cases of universities with multiple agricultural communications faculty members, the person identified for contact was selected on the basis of identified program leadership and teaching experience.

The survey was developed collaboratively by project team members in the National Farm Medicine Center and the Agricultural Communications Documentation Center, University of Illinois. Institutional review boards of the University of Illinois and Marshfield Clinic Research Foundation granted approval. Research Electronic Data Capture (REDcap), a secure web application for building online surveys for research studies, was used for this survey.

Respondents were invited to complete an eight-item, two-page survey. The National Farm Medicine Center was identified in the survey introduction. Topics addressed for the instrument were developed through a review of literature about farm safety communications. The questionnaire was pretested through discussions with eight agricultural communications faculty members at a professional conference. The survey was sent by e-mail to the 35 identified faculty members on November 5, 2013. Two reminders were sent by e-mail during the 2-week response period, and non-respondents were not sampled. No incentives were provided.

This effort resulted in 23 completed questionnaires, a response rate of 66%. Responses were not identified by respondent or institution, and enrollment data for individual programs were not available. However, the favorable response rate helped assure that findings represent a substantial majority of total enrollment in agricultural journalism/communications courses and degree programs at universities throughout the nation. Data analyses are descriptive. Standard summary statistics are presented.

Results
Research Question 1
Part A

Results reported in Table 1 reveal respondents place high priority on safety in farming and agriculture, with 87% identifying safety as extremely important. One respondent noted the special importance of this topic for farm audiences. This finding is consistent with results of research among high school teachers of agriculture in Texas. Researchers found teachers exhibited strong personal beliefs consistent with proper safety preparedness and practices in agricultural settings (Hubert et al, 2001, p. 151).

Table 1

Importance of Safety in Comparison With Other Aspects of Farming and Agriculture

Importance	Number	Percent
Extremely	20	87
Somewhat	2	9
Not very	0	0
Not	0	0
No opinion	1	4
Total	23	100

Part B

More than one-half (52%) of respondents replied positively to this question, but marginally so (see Table 2). None said they believe safety is being communicated very effectively. Thirty-one percent said they hold no opinion about the effectiveness of efforts to communicate about safety with farmers, farm workers, and others in agriculture.

Table 2

How Effectively Safety Is Being Communicated With Farmers, Farm Workers, and Others in Agriculture

How Effectively	Number	Percent
Very	0	0
Somewhat	12	52
Not very	3	13
Not	1	4
No opinion	7	31
Total	23	100

"I'm really not sure," one respondent explained. "I would think there could be farm advertising influences on editorial content related to safety. Yet, you do see some safety stories. Honestly, I'm not sure 'how effectively' the topic is covered."

Another respondent observed food safety is not being communicated well, "but I do believe risk-to-life safety is."

A third respondent observed, "It can be effectively communicated through the communication channels of commodity groups and farm organizations. I do not see the coverage addressed in mainstream media because the writers fail to show the newsworthiness of the situation."

"I think the key question is how effectively is it being taken up by producers," said another respondent, emphasizing the gap across media coverage, awareness of safety among farmers and the practices they actually follow.

Part C

Findings in Table 3 show more than one-half (52%) of respondents recognize some special communications skills are needed to cover farm and agricultural safety.

Table 3

Extent to Which Special Communications Skills are Involved in Reporting Farm and Agricultural Safety

Extent	Number	Percent
Many special skills involved	0	0
Some special skills involved	12	52
Few Special skills involved	5	22
No special skills involved	1	4
No opinion	5	22
Total	23	100

Some of the special skills they identified included

- Knowledge of farming operations, tools, and technologies
- Understanding the nature of farming and the agricultural industry
- Knowledge of the inherent risks involved in farming and in agriculture
- Awareness of and familiarity with terminology involving farming and equipment
- Knowledge of national statistics related to farm safety
- Knowledge of science and agriculture
- Understanding of farmer attitudes and practices related to safety
- Special familiarity with media, media skills and media relations involved in communicating about farm safety

Research Question 2

Responses suggested relatively few courses in these programs involve communicating about farm and agricultural safety. Of the 23 respondents, 74% indicated course work in their programs does not involve this subject area. Only two respondents (9%) reported having courses that do so. An additional 17% said they do not know whether courses in their programs involve such coverage.

One respondent at a university offering such courses replied, "We provide opportunities for students to cover many issues in agriculture through practical communications assignments. Occasionally, students choose, or are assigned, topics related to farm safety." These opportunities take place in courses such as Agricultural Communications, Graphic Design in AFLS, Electronic Communications in Agriculture, Agricultural Reporting and Feature Writing, and Agricultural Campaigns."

Another faculty respondent identified three courses that include units on communicating safety: Agricultural Communications, Risk and Crisis Communications, and Organizational Power and Advocacy. "Most relevant is the Risk and Crisis class," the respondent explained.

In terms of teaching resources used, a respondent reported, "All classes use case studies and resources from Extension services. As you know, safety and communications are not often specifically addressed in traditional ag comm textbooks, so we've supplemented this void with our own materials."

Research Question 3

Findings in Table 4 show 78% of respondents indicated they and their associates would have some interest in gaining access to teaching resources that involve covering — or communicating about — farm safety. Of those, 22% expressed keen interest, while 56% percent said they would be somewhat interested.

Table 4

Level of Interest in Teaching Resources that Involve Covering — or Communicating about — Farm and Agricultural Safety

Interest Level	Number	Percent
Very interested	5	22
Somewhat interested	13	56
Little interest	2	9
No interest	1	4
No opinion	2	9
Total	23	100

Research Question 4

Part A

Findings reported in Table 5 reveal two-thirds or more of the respondents expressed interest in three of the identified four topics: communicating about risk assessment and management, issue management, and ethics and journalistic guidelines in describing/portraying farm and agricultural safety. Ethics and journalistic guidelines commanded greatest interest, with 83% indicating that the topic would be useful in their agricultural communications courses. Responses suggest respondents place about equal priority on prevention-oriented coverage and incident/follow-up coverage of farm and agricultural safety.

Table 5

Topics That Would Be Useful in Your Agricultural Communications Courses

Topics	Response	Number	Percent
Communicating about risk assessment and management in the context of farm safety	Yes	15	65
	No	8	35
Communicating about issue management (e.g., child ag labor laws)	Yes	16	70
	No	7	30
Ethics and journalistic guidelines in describing/ portraying farm and agricultural safety	Yes	19	83
	No	4	17
Preventive *vis a vis* incident/follow-up coverage of farm and agricultural safety	Yes	11	48
	No	12	52

Part B

Responses summarized in Table 6 indicate the responding teachers would find use in varied forms of teaching resources about communications aspects of farm and agricultural safety. Printed materials

ranked highest, with 70% of respondents indicating teaching resources in that form would be useful. However, in this regard, one responded explained, "We don't need copies of the materials — just web access."

More than one-half of the respondents (56% to 65%) indicated the other three forms would be used in agricultural communications courses.

These preferences are both consistent with, and different from, those expressed by high school agriculture teachers in Texas who were invited to express their preference for teaching materials about farm safety. Those teachers preferred safety videos with study guides, class demonstration/simulation activities, and individual study booklets. They expressed relatively low preference for interactive media as teaching tools (Hubert et al, p. 151).

Table 6
Form of safety–oriented teaching resources most likely to be used in agricultural communications courses

Form	Response	Number	Percent
Visual presentations for projection in classes with scripts and option for localization	Yes	14	61
	No	9	39
Printed resources, comprehensive or by topic	Yes	16	70
	No	7	30
Audiovisual presentation for projection in classes, online access or self-instruction	Yes	13	56
	No	10	44
Multi-media teaching modules	Yes	15	65
	No	8	35

Research Question 5

Recognition of all three elements of Lundgren and McMakin's (1998) safety-oriented framework for risk communications was apparent. Respondents expressed interest in teaching resources about farm safety communications involving topics represented in all three functional areas of that framework — care, consensus, and crisis/risk. Several respondents referred to risk communications in their comments and evidence suggested aspects of farm safety communications are being taught at some universities in the context of risk communications.

Discussion

This study provides valuable insights, nationally, about the views, efforts, and ideas of those who are in a position to teach risk communications each year to thousands of aspiring agricultural journalists/communicators and others. Findings reveal an encouraging potential for integrating farm safety into agricultural communications courses. Responding teachers offered positive views about the importance of occupational safety in farming, identified special skills needed for communicating about

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Research

farm safety, and expressed interest in gaining access to related teaching resources. They expressed concern about how effectively safety is being communicated with farmers, farm families, farm workers, and others in agriculture. All of these responses reflect strong potentials and offer direction for pursing them. They offer a promising answer to the question asked by Murphy and Lee (2009), "Where is the education and training to come from?"

In a broader sense, the study helps fit a "lost cousin" — occupational safety in farming and agriculture — into a growing family tree of risk communications related to food, natural resources, renewable energy, rural development, sustainability, and other dimensions of agriculture. Review of existing literature identified concerns among agricultural communications scholars about a gap between the theory and practice of risk communications (Simon, Robertson, & Doerfert, 2003). Findings of the study help identify a strategy for strengthening the practice of farm safety communications as an integral part of risk communications in agriculture, a strategy that encompasses occupational safety of producers as well as health and well-being of consumers.

While these two traditions of interest have developed quite separately, results reveal shared conceptual roots, adding understanding and meaning to them. Recognition of all three elements of Lundgren and McMakin's (1998) safety-oriented framework for risk communications was apparent. Respondents expressed interest in teaching resources about farm safety communications involving topics represented in all three functional areas of risk communications — care, consensus, and crisis/risk. Follow-up within such a framework may help strengthen connections between theory and practice in risk communications (including farm safety communications) related to agriculture.

Recommendations

Results of this survey prompt the following recommendations for research and other potential follow-up efforts:

1. Initiate projects for developing and providing to agricultural communications teachers educational resources that involve the topics and forms identified in this survey. Include research components to assess the use and educational value of those resources.
2. Develop sample course outlines and ideas that identify ways in which to incorporate farm safety communications into existing agricultural communications courses. These resources may include case studies, extension materials, and other references such as those identified through the survey.
3. Develop, pretest, and provide educational resources that identify innovative, non-traditional media strategies for communicating with farm workers, farm families, children, and other special audiences.
4. Identify occupational safety risks associated with new and emerging agricultural technologies such as those identified in this study. Through research, analyze communications aspects of those risks and develop strategic communications options.
5. Guided by feedback from respondents, use research to improve understanding of the special skills and concepts required for covering or otherwise communicating about farm safety. Operationalize these insights for use in planning agricultural communications courses and curricula.
6. Conduct research that addresses dilemmas facing agricultural journalists in decisions about how much "care" and "consulting" to include in their journalistic role of editorial independence, neutrality, and balance.
7. Examine further the linkages between concept and practice in communicating about the risk

and safety aspects of agriculture.

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