Evaluating the Effectiveness of the Texas Parks and Wildlife Hueco Tanks State Historic Site Orientation/Conservation Video: A Media System Dependency Theory Perspective

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Abstract

The major purpose of this study was to provide an evaluation of the effectiveness of Texas Parks & Wildlife Hueco Tanks State Historic Site orientation/conservation video and how the video impacted the way people perceived Hueco Tanks State Historic Site through their media dependencies.

A principal components factor analysis of the 16-item dependency scale of the respondents' post awareness levels, using a varimax rotation factor analysis, yielded three dimensions. The first dimension, passive interest, includes individual orientation, action orientation, solitary play and social play (Cronbach alpha = .87); the second dimension, active interest, includes self-understanding, action orientation and solitary play (Cronbach alpha = .86); and the third dimension, activism, includes social understanding and solitary play (Cronbach alpha = .81).

This study provided a test of the media system dependency theory and, in the process, extended the knowledge of the relationships state park attendants have with the orientation/conservation video. A significant association was determined between the three goal dimensions and personal video dependency relationships. The significant association is important due to the fact that previous media system dependency studies have yielded four or more goal dimensions and have not explored personal video dependency relationships.

Key Word: Media System Dependency Theory, public awareness, media evaluation, state parks

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Introduction

Recent trends of wildlife-based recreation in state parks and environmental issues across Texas have contributed significantly to an explosion of knowledge in media communications. Consequently, a demand for program evaluations has been placed upon wildlife programming (K. Loke, personal communication, August 24, 2002).

Texas Parks & Wildlife compiled a Public-Use Restriction Plan in 1998 after evaluating Hueco Tanks State Historic Site's vandalism issues. The park was closed for a period of reconstruction efforts and an orientation/conservation video was developed by the Texas Parks & Wildlife Media Production Department and sent to Hueco Tanks in spring of 2000 for state park attendees to watch before entering the grounds. The mission of Hueco Tanks orientation/conservation video is: (a) to restore and preserve the prehistoric, historic, geologic and natural features of the area; (b) to provide interpretation to the public; and (c) to provide recreational opportunities which are compatible with the preservation goals of the site.

According to Erickson (1969), our response to wildlife and conservation varies, but the basic appeal in anthropomorphic features still exists. As we become older, we have a heightened interest in wildlife preservation and conservation of the vanishing nature. Morris (1969) explains the reason for this is that the older person is about to become extinct and views vanishing wildlife and nature as symbols of an impending death. Their concern for wanting to preserve wildlife and conserve nature reflects a person's desire to extend his own survival. Morris' (1969) observations suggest that the effectiveness of a message about wildlife conservation may be dependent upon the kind of wildlife/nature issues used in the communicator's message.

As a problem with the interaction between man and animal, many wildlife species have been reduced by hunting, trapping or other means of a loss of habitat. Concern for the conservation of wildlife species and the environment has resulted in the establishment of many governmental agencies. These agencies have started realizing that the key element in the survival of wildlife and conservation of nature lay with an informed and educated public.

Powers (1994) stated that if the audience is to meet the needs of wildlife/nature conservation, educational videos must answer the question of whether wildlife programming ever inspires anyone to take active, positive action toward conservation.

Rogers (1996) explained, "the mass media is the primary sources used by people to gather initial awareness…mass media sources have a great influence upon public perception" (p.215). DeFleur and Ball-Rokeach (1989) stated, "The ultimate basis of media influence lies in the nature of the interdependencies between the media and other social systems and how these interdependencies shape audience relationships with the media. The greater the media dependency in connection with a particular message, the greater the likelihood that the message will alter audience cognitions, feelings and behaviors" (p. 3). Ball-Rokeach and DeFleur (1989) explained that the media system dependency theory predicts a cognitive psychological process that increases the probability of someone being affected by a particular medium. This process begins with either an individual who scans the media to actively decide what he or she wishes to listen to, watch or read, or one who comes into contact with media content.

> In step one, active selectors expose themselves to media content that they have reason to expect will help them to achieve one or more of their understanding, orientation or play goals. Their expectations are based upon their prior experience, conversation with family or friends, or cues obtained from media sources. Casual observers encounter media content incidentally with no preformed expectations (e.g., walking into a room where the TV is on). The observers my find that one or more dependency is activated that motivates them to continue exposure. Other observers might not experience dependency activation and exposure will terminate. In step two, variations in intensity of individuals' media

> dependencies will be a function of differences in their personal goals, their personal and social environments, expectations with regard to the potential utility of the specific media content under consideration, and ease of access to that content. The source of the variation in the intensity of the dependency does not matter; however, the greater the intensity of relevant media dependencies, the greater the degree of cognitive and affective arousal. In step three, involvement refers to active participation in information processing. People who have been cognitively and affectively aroused will engage in the kind of careful processing of information that will allow them to recall or remember the information after exposure. The fourth step, individuals become intensely involved in information processing and are more likely to be affected by their exposure to media content. (Grant, 1989 p. 311)

The step by step process of the effects of specific media content on individual is illustrated in Figure 1.

Emerson (1962) explored the nature and importance of dependency relationships in an article relating the power of a variable (individual, organization, etc.) to the dependence of other variables upon resources controlled by the first variable. Ball-Rockeach (1989) defines the media system as "…an information system in control of three types of 'dependency-engendering' information resources…that others have to have access to in order to attain their goals" (p. 9). These three types of 'dependency-engendering' information resources are identified by Ball-Rockeach (1989) as information gathering or information creating, information processing, and information dissemination.

Ball-Rockeach (1984) investigated three primary dimensions of human motivation, including understanding, orientation and play, that individuals have a dependency relationship with the media system. Grant (1989) stated that "the three dimensions are essential to individual welfare, but they are also not mutually exclusive since any media message may serve more than one type of dependency" (p. 33).

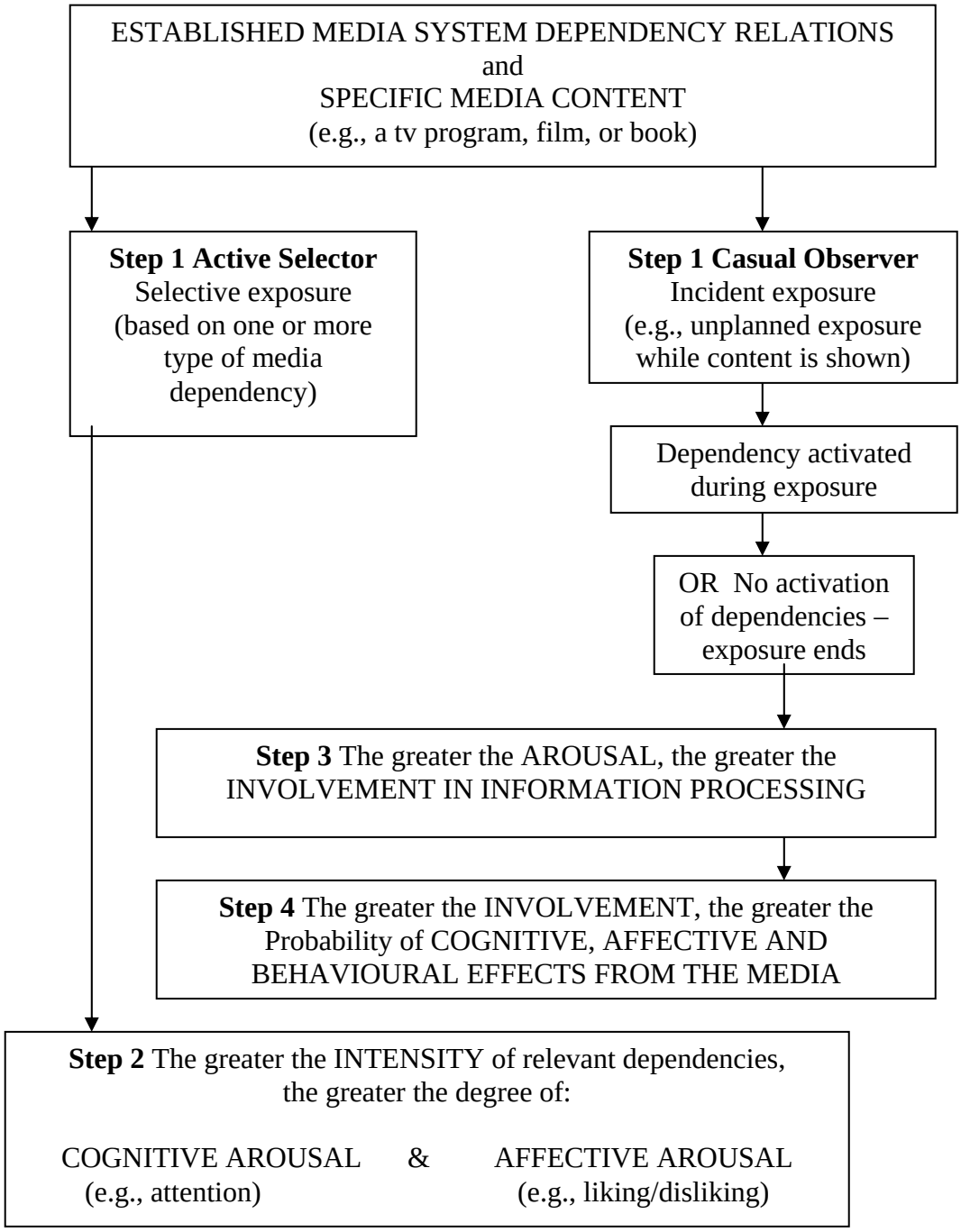

Figure 1: The Process of Effects of Specific Media Content on Individuals (Grant, 1989)

Ball-Rockeach (1984) also explored two sub dimensions for each of the three dimensions yielding six types of goal dimensions of media systems dependency relations shown in Figure 2. The six sub dimensions include: action orientation, interaction orientation, self-understanding,

social understanding, solitary play and social play. The first row refers to individual application and the second row is a more social approach.

Understanding	Orientation	Play
Self understanding Refers to increasing the understanding of who we are. (e.g. learning about your understanding of conservation)	**Action orientation** Refers to pursuing goals regarding personal behavioral decisions. (e.g. deciding on how to conserve the park)	**Solitary play** Refers to attaining individual goals of enjoyment, escape, etc. (e.g. enjoying conserving the park as an individual)
Social understanding Increasing the understanding of the larger social environment. (e.g. interpreting the conservation message of the park)	**Interaction orientation** Attaining goals relating to how to interact with other individuals. (e.g. conserving the park while interacting with others)	**Social play** A shared experience where the presence of others is necessary for attaining goals. (e.g. gain pleasure in conserving park with family/friends)

Figure 2: Goal Dimensions of Media System Dependency Relation (DeFleur & Ball-Rokeach 1989)

Purpose and Research Questions

The purpose of this study was to provide an evaluation of the effectiveness of Texas Parks & Wildlife Hueco Tanks State Historical Site orientation/conservation video. As a means of achieving this purpose, the following objectives were selected:

1. Determine the underlying factors related to the goal dimensions of the media dependency theory.
2. Determine if differences exist between pre and post awareness based on the identified underlying factors.

Methodology

The research framework used for this study was designed after Grant's (1989) media system dependency theory on individuals, and the questions were formatted using a post then pre design allowing respondents to assess their perceived awareness level through a pretest and post test of the same referencing frame. This method minimizes response-shift bias, which can be a source of contamination in self-report assessments (Rockwell & Kohn, 1989). Response-shift bias is a change in an individual's frame of reference because of program participation (Howard & Dailey, 1979).

The target population of this study included the Hueco Tanks State Historic Site attendees during the summer season (May 1 – September 30, 2003). All attendees must view the orientation/conservation video for entering the park. The average number of attendants oriented for the summer season is 4,113. The researchers used a purposeful/criterion sample (n=1,813) (Krejcie & Morgan, 1970). This number was the population entering the park during the second portion (July 4 – September 30, 2003) of the summer season. The population size excluded children 15 years of age and younger for competency reasons. Respondents were asked to voluntarily complete the questionnaire before entering the Hueco Tanks' interpretation center to view the orientation/conservation video. The volunteers were asked to complete the post-test portion of the questionnaire after viewing the video and return their completed questionnaire to the researcher. The researcher collected 270 completed questionnaires with a response rate of 15%.

The instrument used in this study was modeled after Kistler's (2002) Ranch to Rail post then pretest questionnaire. Part one of the questionnaire was used for the educational assessment of the awareness levels before and after they watched the orientation/conservation video. Sixteen statements about the areas covered by the orientation/conservation video were included

in the survey. Those 16 areas were: conservation is a group effort, protecting plant/animal life, privilege of public access, outdoor recreation activities, participating in tours, conserving Hueco Tanks, park conservation, history of Hueco Tanks, Native American culture, conserving wildlife/nature, conservation responsibilities as an individual, respecting Native American art/history, preserving rock art/pictographs, park rules, preventing vandalism, and human impact on the park. A four-point Likert-type scale was used where 1=low awareness level through 4=high awareness level. The instrument was pilot tested with 30 participants outside the sample. Reliability of the test instrument was measured using Cronbach's alpha. Pre awareness and post awareness level scales were .94 and .93 respectively. Part two consisted of five statements dealing with the satisfaction levels of the orientation video. Respondents were asked to rate their satisfaction levels of the video using a four-point Likert-type scale where 1=Very Dissatisfied, 2=Slightly Dissatisfied, 3=Mostly Satisfied, and 4=Completely Satisfied. Part three included demographic questions.

Findings

A principal components factor analysis of the 16-item dependency scale of the respondents' post awareness levels, using a varimax rotation factor analysis, yielded three dimensions. The first dimension, passive interest, includes individual orientation, action orientation, solitary play and social play (Cronbach alpha = .87); the second dimension, active interest, includes self-understanding, action orientation and solitary play (Cronbach alpha = .86); and the third dimension, activism, includes social understanding and solitary play (Cronbach alpha = .81). Factor loadings, eigenvalves and alphas for each factor are reported in Table 1.

Table 1 explains 64.49% of the variance in the original correlation matrix among the 16 items representing the six sub dimension of personal media system dependency relations.

Two considerations are relevant to an interpretation of this three-factor outcome. First, all 16 questions were loaded on all three factors. The first group of questions loaded into the first factor including four of the six sub dimensions of personal media system dependency relations. Those sub dimensions include individual orientation, action orientation, solitary play and social play. Respondents had a 50% variance dealing with this first group of questions and

Table 1: Factor Analysis[1] of Television Dependency Scale

Scale Item (abbreviated)	Factors		
	Passive Interest	Active Interest	Activism
Conserving group (Action Orientation)	.63	.44	.11
Protecting plant/animal life (Solitary Play)	.53	.31	.52
Privileged public access (Interaction Orientation)	.73	.23	.31
Outdoor rec activities (Interaction Orientation)	.84	.21	.19
Participating in tours (Social Play)	.75	.25	.23
Conserving Hueco Tanks (Social Play)	.57	.27	.47
Info on park conservation (Self Understanding)	.30	.71	.14
History of Hueco Tanks (Self Understanding)	.17	.80	.15
Learning NA culture (Self Understanding)	.21	.68	.23
Conserving wildlife/nature (Action Orientation)	.37	.60	.39
Conserving individual (Action Orientation)	.27	.67	.37
Respecting NA art/history (Solitary Play)	.21	.51	.46
Preserving rock art/picot (Solitary Play)	.20	.40	.60
Following park rules (Social Play)	8.380E-02	.26	.79
Preventing vandalism (Social Play)	.36	.14	.72
Human impact on park (Social Play)	.29	.15	.74
Eigenvalue	8.04	1.15	1.12
Percent of variance explained	50.28%	7.23%	6.98%
Reliabilities (alpha) of high-loading items	.87	.86	.81

[1]Principle Components; Varimax Rotation

how they related to the four sub dimensions. The respondents learned about their understanding of conservation, decided on how they were going to conserve the park, realized they could enjoy conserving the park as an individual, and they could gain pleasure in conserving the park with family/friends. The second group of questions loaded into the second factor including three of

the six sub dimensions of personal media system dependency relations. Those sub dimensions included social understanding, action orientation and solitary play. Respondents had a 7.23% variance towards the second group of questions and how they related to the three sub dimensions. The respondents once again learned about their understanding of conservation, interpreted the conservation message of Hueco Tanks, and decided on how they were going to conserve the park. The third group of questions loaded into the third factor including two of the six sub dimensions of personal media system dependency relation. Those sub dimensions included social understanding and solitary play. Respondents had a 6.98% variance dealing with the third group of questions and how they relate to the two sub dimensions. The respondents once again decided how they were going to conserve the park, learned they could attain their conservation goals if they interacted with other individuals, and they could gain enjoyment in conserving the park as an individual.

The second objective was to determine if differences exist between pre and post awareness based on the three underlying factors (passive interest, active interest and activism) of state park attendants whom watched the orientation/conservation video.

In terms of passive interest, a statistically significant difference was found between the pretest and post test. The results indicate the passive interest dimension post awareness (M=3.02, SD=.46) was significantly greater that the passive interest dimension pre awareness (M=2.06, SD=.69), t (269) = -24.05, p=.000. The mean difference was -.96 points between the two four-point Likert ratings for passive interest pre and post awareness. Participants' passive interest was enhanced after viewing the orientation video. Similarly, active interest dimensions pre and post awareness had a statistically significant difference. The active interest dimension post awareness (M=3.10, SD=.37) was significantly greater that the active interest dimension pre

awareness (M=2.03, SD=.67), t (269) = -27.27, p=.000. The mean difference was -1.07 points between the two four-point Likert ratings for active interest pre and post awareness. Participants' active interest was enhanced after viewing the orientation video. The third dimension, activism, had a statistically significant difference between the pre and post awareness. The activism dimension post awareness (M=3.04, SD =.31) was significantly greater than the activism dimension pre awareness (M=2.20, SD=.75), t (269) = -19.34, p=.000. The mean difference was -.84 points between the two four-point Likert ratings for active interest pre and post awareness. Participants' activism was enhanced after viewing the orientation video.

Conclusions and Recommendations

This study provided a test of the media systems dependency theory. The 16 items representing the six sub-dimensions of the media system dependency theory explained 64.49% of the variance in respondents' post-awareness level toward the orientation video. A significant association was found between three goal dimensions and personal video dependency relationships. This is important due to the fact that previous media dependency studies have yielded four or more goal dimensions and have not explored personal video dependency relationships.

The following recommendations are made based on the purpose of this study:

Recommendations for Practice

1. The Hueco Tanks State Historic Site orientation/conservation video should be evaluated on a yearly basis to ensure that state park attendants are receiving the conservation message of the video.

2. Other Texas Parks and Wildlife state parks, national parks, natural resource managers and agencies, television programming producers, and wildlife conservation organizations should consider modeling this study to evaluate additional conservation videos in their effort to inform the public and increase awareness on conservation issues.

Recommendations for Further Research

1. Additional studies should be conducted in order to further review how the media system dependency theory interacts with other conservation mediums such as guided tours, brochures, television, videos, interactive computer software, etc.
2. A study should be conducted on the Hueco Tanks State Historic Site English and Spanish orientation/conservation videos to determine language barriers compared to ethnicities of state park attendants to improve the understand of the conservation message of the video.
3. A study should be conducted on the visual effects the orientation/conservation video compared to a live-guided orientation to determine the best way to spread the state park conservation message.
4. Contrary to DeFleur and Ball-Rokeach (1989) the 16-item instrument which they proposed appears to not be one-dimensional in this context. Figure 3 depicts three unique dimensions that should be explored in other situations.

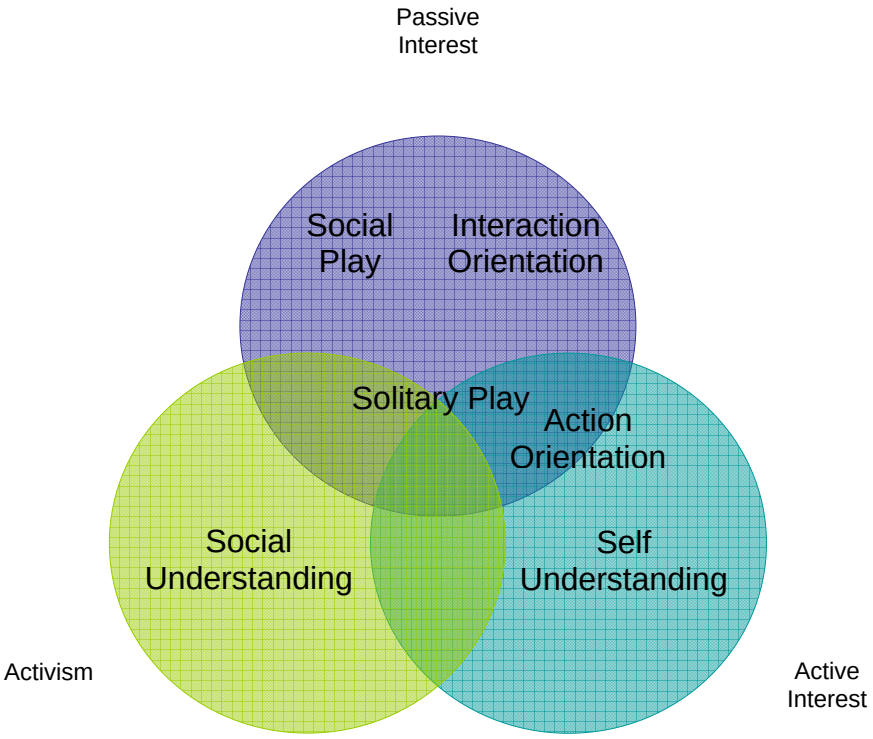

Figure3: Three Factors/Goal Dimensions of Media System Dependency Relations

5. Items related to solitary play were the common denominator in the three dimensions. According to Taylor (1959), play is associated with spontaneous creativity. Spontaneous creativity is often seen in children and is exemplified in drawing and play. Subsequent research should further examine the linkage between spontaneous creativity and media dependency.

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Assessing Agricultural Communications Students' Learning Styles

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Key words: Learning styles, teaching, advising

Assessing Agricultural Communications Students' Learning Styles

Abstract

The agricultural communications program at Oklahoma State University has had a 625-percent increase in students enrolled during the past 12 years. However, little research has been done to evaluate the types of students enrolling in the program. Specifically, no studies assessing what learning styles and demographic profiles are prevalent among the student population in this degree program have been analyzed.

This research project used the Gregorc Style Delineator (1982) to determine what styles could be found within the student population. The test was administered to 136 students. Demographic information was collected to determine what impact, if any, these characteristics had on learning style. The dominant learning style among the group tested was Concrete Sequential. According to Gregorc, individuals with this learning style tend to be more fact-oriented and methodical in their thought process (Gregorc, 1982). Demographically, several values were studied, including gender, classification, composite ACT score, cumulative grade point average, and residency. Recommendations included conducting future research to assess the possibility of variables affecting learning styles and student success. If information could be gathered from additional agricultural communications programs across the country, a more accurate and well-rounded assessment of the learning styles and demographics of agricultural communications students could be made.

Introduction/Theoretical Framework

Considerable research has been reported regarding learning styles and their effects on academic performance (Torres, 1993; Torres & Cano, 1994; Cano & Porter, 1997; Honeyman & Miller, 1998; Cano, 1999) Learning styles are described by Gregorc (1979) as a learning environment adaptation, indicated by a set of particular behaviors used when gathering information. Similar to this is cognitive style, which is defined as the way people organize information and arrive at judgments or conclusions based on their observations (Hunt, Krzystofiak, Meindl and Yousry, 1989). Cognitive style has gained prominence in the organizational behavior literature as researchers use it as a basis for studying decision-making behavior, conflict, strategy development, and group processes (Leonard, Scholl & Lowalski, 1999).

Research has been completed to determine the learning styles of students enrolled in agriculture, and overall, they are generally portrayed as concrete learners (Dyer & Osborne, 1996). Numerous studies in agricultural education have used the Group Embedded Figures Test (GEFT) to measure learning styles. However, except for a few, most of the learning-style research conducted in agricultural education has been explorative and has not considered the impact of students' learning styles on teaching and learning (Day, Raven & Newman, 1998). The focus also has been more on agricultural education students, not agricultural communications students.

It is important for a department to understand the learning styles of its students, as it can be beneficial for the student, instructor, and adviser. Torres and Cano (1995) maintain "learning style affects the learning success of students in specific kinds of situations, instructors need to be sensitive to learning style differences" (p.7). Advising duties can be enhanced through an

understanding of learning styles and students' preferences for teaching methods or curriculum materials (Torres & Cano, 1995). Murano & Knight (1999) reported "study skills and the ability to remain attentive in class were different between learning styles" (p.52). Therefore, the assessment of learning styles can be used for building strategies to enhance the learning transfer between instructor and student. However, there is research where the relationship between course achievement and a student's learning style is positive, but low (Garton, Spain, Lamberson & Spiers, 1999).

The agricultural communications program at Oklahoma State University has had a 625-percent increase in students enrolled during the past 12 years (Table 1). However, little research

Table 1

Increase in student enrollment in agricultural communications at the Oklahoma State University

Majors available to students	Fall 1991	Fall 1993	Fall 1995	Fall 1997	Fall 1999	Fall 2001	Fall 2003
Agricultural Communications	24	63	85	91	118	133	133
Agricultural Communications/ Animal Science Double					20	16	17
Agricultural Communications Total	24	63	85	91	138	149	150

Note. The agricultural communications/animal science double major became available to students in the fall of 1998.

has been done to evaluate what types of students are enrolling in the program. Specifically, what learning styles and demographics are prevalent among the student population in this degree program?

While there has been research to determine the importance of learning styles, the effect of learning styles on agricultural communications students has yet to be studied. By assessing the

learning style of students within the program at OSU, faculty can use this information along with demographic data to focus curriculum on meeting the needs of all students in the program.

The purpose of the agricultural communications degree program at OSU is to provide students with a broad knowledge base in both communications and agriculture. The first agricultural journalism classes were offered at the university in 1927.

Students are required to complete coursework focusing on practical application. These courses include broadcasting, photography, Web design, writing and public speaking. The demands of the coursework require students to not only learn material, but also to focus on the application of the learned material.

Purpose/Research Questions

Because of the small amount of research available, the primary purpose of this study was to provide literature about predominant learning styles among agricultural communications students at Oklahoma State University and the demographic profile of those students. Specifically, this study was done to address the following research questions:

1. What is the dominant learning style of agricultural communications students at OSU?
2. What is the demographic profile of agricultural communications students at OSU?
3. How did the learning style of agricultural communications students at OSU differ based on demographic characteristics?

Methods/Procedures

To determine the learning styles present within the program, researchers determined the Gregorc Style Delineator instrument would be the most effective. Gregorc's instrument is based on the ORGANON System: an organized viewpoint of how and why the human mind functions and manifests itself through the human personality (Gregorc, 1982). The system views the

human mind as an instrument of thought that determines the ways realization and actualization will be achieved. Gregorc developed his own Style Delineator as a self analysis tool. It is based on Mediation Ability Theory that states the human mind has channels through which it receives and expresses information most efficiently and effectively (Gregorc, 1979). The Style Delineator works with two abilities, perception and ordering, to determine an individual's learning style.

Perception is the way people grasp information. People perceive information in either an abstract or concrete way. Individuals with an abstract perception are able to understand information and visualize it without using their physical senses (Gregorc, 1982). Gregorc (1982) further maintains perceiving information in a concrete manner requires information that is visible in the concrete, physical world and can be understood using physical senses.

Ordering abilities are how people arrange, process, reference and dispose of information (Gregorc, 1982). In this area, people rely on either a sequence or random method. Sequential learners use a step-by-step, methodical method to process information. Randomness, on the other hand, is a characteristic that allows people to absorb information as it comes and process it without any predetermined order (Gregorc, 1982). The Style Delineator model uses these different methods to create four combinations of learning styles: Concrete/Sequential, Abstract/Sequential, Concrete/Random, and Abstract/Random.

The Style Delineator was administered to 136 students enrolled in agricultural communications courses during the fall 2003 semester. The test includes 10 sets of four words. Students were asked to rank the words according to the best and most powerful descriptor of themselves. It was based on first impressions and took an average of less than five minutes to complete. The results of the test, as well as gender, classification, composite ACT score,

cumulative grade point average, and state of permanent residency were recorded and processed to determine what if any trends existed within the data.

Results/Findings

Out of 151 total agricultural communications students enrolled during the fall 2003 semester, 136 (90.1%) completed the Style Delineator. One respondent filled out the instrument incorrectly, resulting in only 135 useable responses.

Question One: *What is the dominant learning style of agricultural communications students at OSU?*

Of the 135 respondents, 57 (42.2%) were Concrete/Sequential, nine (6.7%) were Abstract/Sequential, 31 (23.0%) Abstract/Random, and 28 (20.7%) Concrete/Random (Figure 1). Ten (7.4%) respondents had the same score in more than one of the four mediation channels.

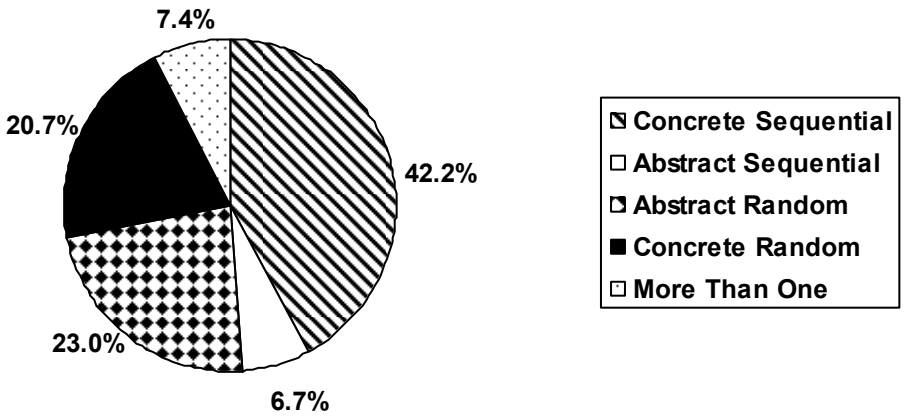

Figure 1. Learning styles of agricultural communications students at this Oklahoma State University?

Question Two: *What is the demographic profile of agricultural communications students at OSU?*

Several demographic characteristics were evaluated including gender, classification, composite ACT score, cumulative grade point average, and state of permanent residency.

Of the 135 respondents, 102 (75.6%) were female and 33 (24.4%) were male. The classification of the students was determined by hours completed at the end of the fall 2003 semester. Students with 0-29 hours were classified as freshmen, 30-59 hours as sophomores, 60-89 hours as juniors, and 90 or more hours as seniors. Based on these categories, twenty-nine (21.3%) were freshmen, 19 (14%) were sophomores, 37 (27.2%) were juniors and 50 (37.5%) were seniors.

The composite ACT scores of the students ranged from 12 to 32. It is important to note scores were unavailable for 17 (12.6%) of the participants. Of the reported ACT scores, the mean score was a 23.17 (Table 2).

Table 2

Composite ACT scores received by agricultural communications students at the Oklahoma State University

Range of Composite ACT Scores	N	%
Less than 14	2	1.5
15-19	25	20.0
20-24	42	31.1
25-29	42	31.1
30-36	7	5.2
Data Unavailable	17	12.6

The cumulative grade point average of the students ranged from a minimum of 1.667 to a maximum of 4.000 with a mean GPA of 3.188 (Table 3). Of the participants, three (2.2%) had a

Table 3

Values for composite ACT scores and cumulative GPA

	Minimum	Maximum	Mean
Composite ACT Score (N=119)	12	32	23.12
Cumulative GPA (N=135)	1.667	4.000	3.188

GPA of 1.999 or less, 16 (11.9%) students had a GPA of 2.000-2.499, 27 students (20.0%) had a GPA of 2.500-2.999, 40 (29.6%) students had a GPA of 3.000-3.499, 40 (29.6%) students had a GPA of 3.500-3.999, and nine (6.7%) students had a 4.000 GPA.

In-state, out-of-state, and out-of-country residency status was the final demographic characteristic to be evaluated. Of the respondents, 100 (74.1%) students were residents of Oklahoma, 33 (24.4%) students were from other states, and two (1.5%) were international students.

Question Three: *How did the learning style of agricultural communications students at OSU differ based on demographic characteristics?*

When comparing learning styles with gender, 46 (45.1%) of the females were Concrete/Sequential, while 11 (33.3%) males were Concrete/Sequential. Eight (7.8%) females were Abstract/Sequential and one (3.0%) male was Abstract/Sequential. Twenty-three (22.6%) females and eight (24.3%) males had an Abstract/Random learning style. Seventeen (16.7%) females and 11 (33.3%) males were Concrete/Random. Eight (7.8%) females and two (6.1%) males received the same score in more than one of the mediation channels (Table 4).

Table 4

Learning styles based on gender

	Male %	Female %
Concrete Sequential	33.3	45.1
Abstract Sequential	3.0	7.8
Abstract Random	24.3	22.6
Concrete Random	33.3	16.7
Two or More the Same	6.1	7.8

Learning styles based on classification showed the largest percentage of freshmen were Concrete/Sequential (58.6%, 17 of 29). The largest percentage of sophomores had a random learning style with 26.3% (5 of 19) Abstract/Random, and 26.3% (5 of 19) Concrete/Random. The largest percentage of juniors had a concrete learning style with 35.2% (13 of 37) Concrete/Sequential and 32.4% (12 of 37) Abstract/Random. Overall, the largest percentage of seniors (46.0%, 23) was Concrete/Sequential (Table 5).

Table 5

Learning styles based on classification (N)

	Freshman	Sophomore	Junior	Senior
Concrete Sequential	17	4	13	23
Abstract Sequential	2	3	1	3
Abstract Random	5	5	12	9
Concrete Random	4	5	7	12
Two or More	1	2	4	3

The learning styles based on composite ACT score were scattered across all score areas and learning styles. The majority of agricultural communications students (62.2%, 84) had scores between 20 and 29 and were predominantly Concrete/Sequential (45.2%, 38) (Table 6).

The differences between learning styles based on cumulative GPA are similar to those based on composite ACT score. A majority (65.9%, 89) of students had a GPA between 3.000 and 4.000. The majority of these respondents were predominantly concrete sequential (50.6%, 45) (Table 7).

Table 6

Learning styles based on composite ACT score (N)

	14 or less	15-19	20-24	25-29	30-36	Data Unavailable	Total
Concrete Sequential	1	10	17	21	2	6	57
Abstract Sequential		1	2	3	1	2	9
Abstract Random		7	11	7	2	4	31
Concrete Random	1	6	8	8	2	3	28
Two or More		1	4	3		2	10
Total	2	25	42	42	7	17	135

Table 7

Learning styles based on cumulative grade point average (N)

	1.999 or less	2.000-2.499	2.500-2.999	3.000-3.499	3.500-3.999	4.000	Total
Concrete Sequential		4	8	18	18	9	57
Abstract Sequential		1	3	2	3		9
Abstract Random	1	7	7	10	6		31
Concrete Random	2	3	7	8	8		28
Two or more		1	2	2	5		10
Total	3	16	27	40	40	9	135

The finding for the difference in learning styles based on permanent residency show that in-state and out-of-state students have a very similar makeup. In-state students were predominantly concrete sequential (41%, 41). The majority of out-of-state students were concrete sequential (45.7%, 16) or concrete random (20.0%, 7) (Table 8).

Table 8

Learning styles based on permanent residency (N)

	In-State	Out-of-State	Total
Concrete Sequential	41	16	57
Abstract Sequential	7	2	9
Abstract Random	25	6	31
Concrete Random	21	7	28
Two the Same	6	4	10
Total	100	35	135

Conclusions

Conclusions for this study included:

- The largest group of agricultural communications students had learning styles that exhibit concrete traits, the majority being Concrete/Sequential.
- The majority of agricultural communications graduates are females, junior or seniors, have a composite ACT score of 20-29, a cumulative GPA of 3.000 or higher, and their permanent residence in Oklahoma.
- A majority of males were concrete random (55.9%), while a majority of females were concrete sequential (61.9%) in their learning style.
- Few agricultural communications graduates exhibit an abstract sequential learning style (6.67%).
- Both in-state and out-of-state students exhibited concrete traits, particularly concrete sequential traits (42.2%).

Implications/Recommendations

It is important for the reader to not generalize the results of this study beyond this limited sample. However, the results of the study are beneficial to both the teacher and student. The diversity of the learning styles assessed by the Gregorc instrument support the need for teachers/instructors to have a broad knowledge of teaching methods to meet the learning needs of all students. This claim supports previous research conducted by Torres & Cano (1995) using the Group Embedded Figures Test.

Teaching professionals who have a clear understanding of their own learning styles can possibly create a more effective learning environment by being cognizant of their preferred teaching style. Dunn & Dunn (1979) maintain an instructor's learning style is reflected in the methods by which they choose to teach. With this in mind, teachers can use their knowledge of the student's learning style to direct more of the methods or curriculum to reach the diverse learning needs of the class (Torres & Cano, 1995; Brandt, 1990).

Students, having knowledge of their preferred learning style, can develop more effective techniques when working with other students with diverse learning needs. Torres & Cano (1995) maintain this knowledge can also assist students to cope with and adapt to various teaching styles encountered in any university system.

Recommendations for application from this study include:

- Faculty should look at teaching methods congruent with the dominant learning styles, while continuing to meet the needs of all learning styles.
- It is important faculty become aware of and incorporates diverse teaching methods to meet the needs of the gender-different learning styles.

Recommendations for future research from this study include:

- Determining the relationship among demographic characteristics, learning styles, and student success.
- Longitudinal studies to compare student success and learning style knowledge when compared to students who have not been educated in their learning style.
- Continuing to examine learning styles and teaching methods to determine if students' needs are met through new teaching and advising techniques.
- Using the same instrument to determine if there are any differences or similarities in students' learning styles based on academic program, department, college or university.
- Perform a national study to see if agricultural communications students on a national level are similar to those attending Oklahoma State University.

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Cognitive Responses by West Texas Hispanic/Latinos to Agricultural News: A Comparison of Four English and Spanish Presentation Media

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Abstract

Agriculturists often seek ways to convey the importance of agriculture. Most professionals in agricultural education develop and research the effects of agricultural education programming with youth and adult populations. Agricultural communicators often seek descriptive information pertaining to effects of agricultural mass medium and on a diverse audience. This study focused on recall of an agricultural news story presented in various mass mediums to a sample of West Texas Hispanics/Latinos.

The study used an experimental posttest-only control-group design to compare four English and Spanish presentation media: newspaper print, electronic text, video news release, and radio news release. Participants were bilingual Hispanic/Latino attendees of the Texas Tech Raiders Rojos Back to School Fiesta (n=144). The participants were randomly assigned to one of eight treatment groups and a control group. The dependent measures included aided recall and unaided recall.

Results indicate significant differences in aided recall between English newspaper print and English electronic text, Spanish newspaper print, and Spanish electronic text. A significant difference also occurred between English video news release and Spanish electronic text. Results indicated a strong correlation between aided and unaided recall.

The authors suggest limiting time and resources on the production of Spanish language printed material targeting the Hispanic/Latino population of West Texas. The authors also suggest replication in similar Hispanic/Latino populations and other ethnic groups.

Cognitive Responses by West Texas Hispanic/Latinos to Agricultural News: A Comparison of Four English and Spanish Presentation Media

Introduction

Leaders in the agricultural and natural resource industry have identified farm policy as a means of economic sustainability for the rural community. In the early 20th Century, the farm press was an authoritative source of rural public opinion, linking the farmer and rural America to federal and state political agendas affecting agriculture. The roles of these traditional, rural opinion leaders have evolved. Agricultural communicators now work in the areas of marketing, public relations, education, and journalism; however, they still seek and focus on areas to enhance and sustain the quality of life for agriculturists and rural residents (Shulman, 1999).

Today, agricultural communicators face an educational challenge, also referred to as agricultural literacy. Unlike previous generations, most Americans do not understand the dynamics of agriculture, including federal and state policy issues (Boone, Meisenbach, & Tucker, 2000). This claim is supported in a Delphi study conducted by Frick, Kahler, and Miller (1991), revealing agricultural policy as one of 11 broad subject areas falling within the area of agricultural literacy and communications.

According to Evans (in Boone et al., 2000), efforts in agricultural communications must mirror changes in culture, media, information systems, and agriculture. Advances in technology and agriculture have dominated issue discussions for several decades; however, the ethnic dimension of America is transforming like never before, especially the Hispanic/Latino population (U.S. Census Bureau, 2000a).

An investigation into media effects and usage among the Hispanic/Latino community is plausible. This assumption is based on the conclusion that little scholarly literature exists

concerning Hispanic/Latino media usage and effects, especially about issues pertaining to agricultural policy. In addition, inferential research must be included in communication and education research in order to move the disciplines forward. Tucker (1996) elaborates on the need for agricultural communicators to move beyond descriptive research.

> The first barrier concerns the fact that little of our research extends beyond descriptive work. Indeed, most of us are more comfortable to describe our research in terms of methodology, such as "content analysis" or "readership survey," than to address equally important issues of theoretical orientation. (p. 36)

The Hispanic/Latino population recently has surpassed the Black/African American population as the largest minority group in the United States. In the state of Texas, the Hispanic/Latino population percentage has increased from 27.1% in 1990 to 30.6% in 2000 (U.S. Census Bureau, 2000a). The percentage of Hispanic/Latino registered voters, as well as the voter turnout of Hispanic/Latino residents, also has increased. This growth of the Hispanic/Latino population has had a profound impact on America's political and social landscape (Maharidge, 1998).

Agriculture is the largest industry in the South Plains of West Texas, accounting for more than $25 billion in revenue (Lubbock Chamber of Commerce, 2003). Furthermore, the Hispanic/Latino political and social presence has increased due to population growth and political unionization (Maharidge, 1998). For these reasons, agriculturists must investigate phenomena influencing growing populations' political and social trends.

Doerfert, Akers, Haygood, and Kistler (2003) declared the media's ability to influence social behavior, social change, and policy agenda as essential inquiry when analyzing biotechnology and food production issues. Inquiry was also recommended in the area of specific media effects as it relates to agricultural policy. These suggestions resulted from a case study conducted on the 2002 Oregon vote for mandatory labeling of genetically modified foods.

The purpose of this study was to determine if any measurable difference in unaided and aided recall resulted from various forms of mass media presented to the Hispanic/Latino population of the South Plains of West Texas. Solicited Hispanic/Latino participants were studied in order to determine if significant differences exist between those who consume agricultural policy news through the following media: English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release.

Research Hypotheses

The following research hypotheses, generated from the literature review, were tested.

1. Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in aided recall of local agriculture policy news.
2. Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in unaided recall of local agriculture policy news.

Theoretical/Conceptual Framework

Establishing the salience among the public so an issue becomes the primary focus of public attention is an initial stage in the formation of public opinion. The news media, through

various forms, exert a significant influence on perceptions of current salient issues. Furthermore, the news media can set the agenda for public thought, discussion, and debate (Cohen, 1963).

Contemporary theoretical support for mass communication affects on political and social issues comes from the agenda-setting theory. The theory of agenda setting can be traced to McCombs and Shaw (1972) who attempted to explain why and how people think about and ultimately rank various social issues. These researchers and theorists found a significant correlation between amounts of media coverage and issue importance ranking by news consumers. Ultimately, this finding led to the conclusion issue salience is greatly influenced by mass media. Agenda setting is considered a key component of the modern democratic process. *Figure 1* outlines the issue process in a democratic society. Agenda setting functions in the democratic process are located between interest groups and the media, between the media and the public, and between the public and the government. The primary focus of the agenda setting function in this inquiry is located between the media and the public.

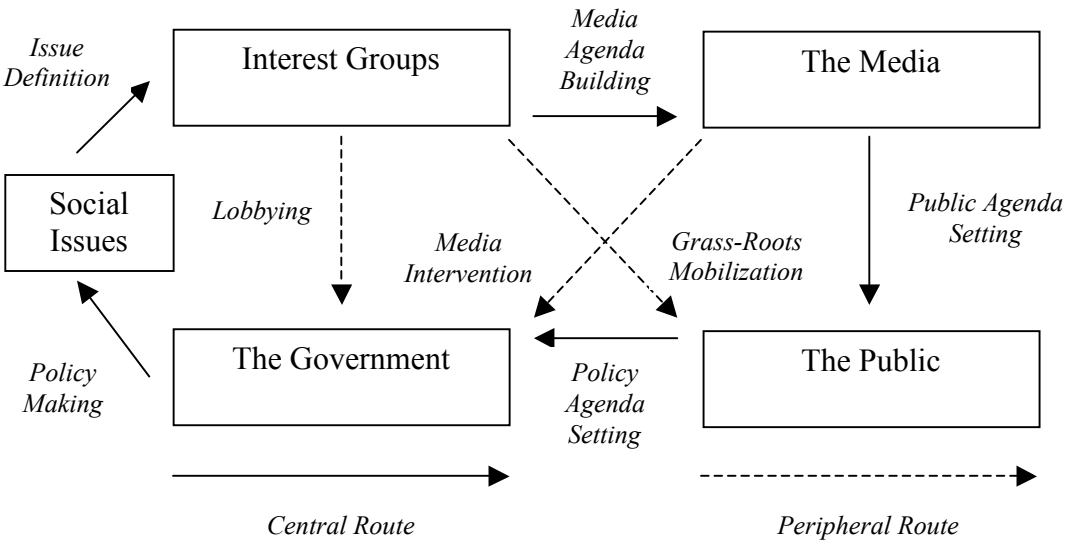

Figure. Issue process in a democratic society. Adapted from Graber, 1993.

The notion of agenda setting is a positive association between mass media and news consumers. From agenda setting stems the formation of public opinions and the development of pros and cons of a particular social or political issue. The agenda-setting theory shifts the focus of inquiry away from immediate effects of mass media on attitudes and opinions to long-term effects on actual cognition. Put simply, agenda setting relies on the actual transfer of issues from the media to the public (Shaw, 1979).

Literature Summary

Comparisons of cognitive effects as a result of various presentation media is a dynamic phenomenon. In general adult populations' recalls are much stronger when information is consumed via print; however, children recall more from television. Radio seems to produce less recall than any other medium (Beenjtes, Vooijes, & Van Der Voort, 1993; Boone, Miller, & Brown 1996; Furnham & Gunter, 1985; Kellerman, 1985; Newcomb-Trefz, 1987; Sundar, 2000).

Comparisons of cognitive effects as a result of various presentations are much different in other cultures, especially those outside the United States. These populations recall more from radio than Americans, while Americans perform better than other cultures with electronic text. Finally, it is concluded acculturation is a significant determent of Spanish versus English presentation in mass media. Hispanics/Latinos with a higher acculturation level recall more and prefer English presentation, while those less acculturated perform better with Spanish delivery (Facorro & DeFleur, 1993; Newton, 1986; Nicholls & Roslow, 1996; Stauffer, Frost, & Rybolt, 1981; Ueltschy & Krampf 1997; Valencia, 1985).

This particular investigation ultimately breaks new ground for cross-cultural and media effects research in agricultural communications. Few similar studies, measuring cognitive recall when exposed to various forms of media presentation, exist within the discipline (Boone, 1994).

Recommendations have been made for agricultural communicators to continue a focused research efforts on improving information and media communication so to educate clientele, especially with the vast quantity of information becoming accessible to citizens through new channels, such as the information superhighway (Boone et. al, 1996). Furthermore, Doerfert (2003) recommended more rigorous research designs in agricultural literacy studies.

Methods and Procedures

The study physically took place in the education facility on the Texas Tech University campus. Subjects for the study were solicited at the Back to School Fiesta sponsored by the Raiders Rojos, an alumni organization with a mission to assist higher education recruitment and retention efforts within the Hispanic/Latino community. The event time was approximately 11:00 a.m., August 16, 2003. The duration of the event was approximately four hours. The Back to School Fiesta brings more than 400 Hispanic/Latino families with higher education interests to the campus. Of the event participants, a majority were residents of the South Plains of West Texas.

Four classrooms were used to facilitate the eight treatments, while one classroom was reserved as a holding area and control group testing area. Each of the four treatment rooms were used to establish areas specific to delivery medium: newspaper print, electronic text, radio news release, and video news release. One round of treatments was administered using a randomly selected English version of all media. The second round of treatments used a randomly selected Spanish version of all media. Participants were randomly assigned to control treatment throughout the entire study.

The subjects were then presented with one of the eight forms of presentation medium or a control function. All news media, or treatments, provided the same content. The first of three news stories provided content about Charles Taylor, president of Liberia, stepping down from power. Because this story is of no significance to agricultural issues, it was used as an initial "dummy" story. The second story, the one of particular interest, provided information pertaining to the importance of the 2002 Farm Bill. The third and final story, also used as a "dummy" story, named President George Bush's choice for chair of the Environmental Protection Agency.

Immediately after the treatment, cognition levels were determined through unaided, then aided recall. In unaided recall, subjects were asked to recall as much information about the three news stories as possible. The aided recall followed and consisted of a multiple-choice examination. Content pertaining to story two, the 2002 Farm Bill, was the only information tested in the aided recall portion of the instrument.

Control group participants were asked to complete the demographic portion of the questionnaire. Finally, they were asked to complete the aided recall portion of the measure. Again, the control group received no treatment and was used in the means comparison with the tested media groups.

The independent variable for this study was media presentation. The qualitative, independent variable consisted of nine treatment levels of different types. This is not to be confused with quantitative treatment levels, which refer to different amounts of a particular independent variable (Kirk, 1995). Multiple dependent variables were used in this study, two forms of recall, unaided and aided. *Figure 2* offers a visual representation to the CR-9 design.

R	a_1	O_1
R	a_2	O_1
R	a_3	O_1
R	a_4	O_1
R	a_5	O_1
R	a_6	O_1
R	a_7	O_1
R	a_8	O_1
R	C	O_1

Figure 2. Gall, Borg, & Gall (1996) posttest-only control-group, randomized subject design: R = random assignment, O_1 = posttest measures, a_1 = English newspaper print, a_2 = Spanish newspaper print, a_3 = English electronic text, a_4 = Spanish electronic text, a_5 = English radio news release, a_6 = Spanish radio news release, a_7 = English video news release, a_8 = Spanish video news release, C = control group

This design was applied in order to maximize experimental control, anticipating not needing ANCOVA to further equate the experimental groups (Hinkle, Wiersma, & Jurs, 1998). With this design, experimental control, statistical controls, as well as the fact all participants were randomly solicited and randomly assigned for the study, a more than adequate balance was achieved. This balance yielded tenable results.

The population consisted of Hispanic/Latino adults living in the South Plains of West Texas. A purposeful sample (n=144) was solicited from the Hispanic/Latino adult population attending the annual Back to School Fiesta sponsored by the Raiders Rojos of Texas Tech University. The maximum sample of 144 subjects was derived from a logistical standpoint.

Each classroom can accommodate no more than 16 subjects. Given the nine treatment levels of the independent variable and the classroom size of 16 subjects, 144 participants were solicited. Solicited individuals were not required to participate in the study. A Texas Tech baseball cap was given as an incentive to participate in the study. All participants were presented with a Human Subject's Consent Form during the initial demographic data collection period. The consenting adults were randomly assigned as they agreed to participate to one of nine treatments. As soon as a class filled with 16 participants, the treatment began. The nine presentation media treatments were randomly ordered with English media, followed by Spanish media. They were administered accordingly. All treatment groups, including the control group, were equal in number (n=16).

The measurement and treatment instruments were tested for face and content validity by experts in mass media and the Spanish language. Both journalists at the *Lubbock Avalanche-Journal* and KXTQ FM, and Spanish translation specialists at the Graduate School of Texas Tech University were used in instrument and treatment development.

To establish internal consistency reliability before data collection, the multi-choice, or aided recall portion of the instrument was pilot tested among a sample (n=24) of Hispanic/Latino staff members at Texas Tech University. The reliability of the pilot test was measured by the Kuder-Richardson-20 (KR-20) formula upon completion. The reliability of the aided recall test was also measured by the Kuder-Richardson-20 (KR-20) formula upon completion of the immediate posttest. The Kuder-Richardson-20 is a common reliability measure for multiple-choice instruments in multi-modal presentation research (Rieber, 1991; Rieber, Boyce, & Assad, 1990). After removing one question, the remaining 12 items yielded an alpha level of 0.56 using the KR-20. This alpha level was deemed acceptable as they exceeded Nunnally's (1967)

recommendation of 0.50 to 0.60 for initial stages of instrument development. The Kuder-Richardson-20 also yielded an alpha level of 0.61 for the aided recall portion of the analysis. This was deemed acceptable for the investigation.

Because the unaided recall section of the instrument was analyzed qualitatively, no statistical reliability tests were administered for the two portions; however, strict data analysis procedures ensure instrument reliability for these sections. Content analysis (Glesne, 1998) was used as a qualitative procedure in order to determine unaided recall effects of the presentation media.

For the unaided recall portion of the measure, all true points listed in the description were scored as +1. There were no untrue statements in the descriptions given by the participants; therefore, negative scoring was not used. The true points were summed for each story, and then the three stories were summed as well. Given the number of true points in the individual stories, the mean recall percentages for each story were consistent; therefore, equal recall from each story can be assumed. SPSS for Windows® was used for most data analyses.

Result and Finding

The sample consisted of 144 (n=144) bilingual adult Hispanic/Latinos of West Texas. Of the participants, 58 (40.3%) were male, while 86 (59.7%) were female. The average age of the participants was 35.9 (SD=11.6), with the oldest participant being 68 and the youngest 18. The median age of the participants was 36. Married participants comprise 60.1% of the sample, while 31.5% were single, and 8.4% were divorced. Of the participants, 69.9% were registered voters while 30.1% were not registered to vote. The voting percentage does not reflect, or attempt to reflect, actual voter turnout. The education level of the participants varied from no

schooling to graduate and professional degrees. The majority of the participants had a high school degree. Three participants indicated no formal education, while 11 reported a graduate or professional degree.

English print produced the highest average aided recall of 0.55 (SD=0.13). This medium was followed by English video new release with an average of 0.52 (SD=0.18). The lowest recall resulted from the Spanish electronic text with an average of 0.25 (SD=0.13). Table 1 reports mean scores, standard deviations, standard error, and confidence intervals for each treatment group.

Table 1
Summary of aided recall for treatment groups.

				95% Confidence Interval	
Treatment	M	SD	SE	Lower	Upper
English Print	0.55	0.13	0.42	0.46	0.63
English Video News Release	0.52	0.18	0.42	0.43	0.60
Spanish Video News Release	0.40	0.16	0.42	0.31	0.48
Spanish Radio News Release	0.37	0.17	0.42	0.29	0.45
English Radio News Release	0.36	0.16	0.42	0.28	0.44
Spanish Print	0.35	0.23	0.42	0.27	0.44
English Electronic Text	0.34	0.2	0.42	0.26	0.42
Spanish Electronic Text	0.24	0.13	0.42	0.16	0.33
Control	0.19	0.12	0.42	0.11	0.28

SE – Standard Error

The unaided recall portion of the instrument used content analysis to code the data. All true points listed in the description were scored as +1. There were no untrue statements in the descriptions given by the participants; therefore, negative scoring was not used. The true points were summed for each story, and then the three stories were summed as well. Given the number of true points in the individual stories, the mean recall percentages for each story were consistent; therefore, equal recall from each story can be assumed.

English print revealed the highest average of unaided recall at 14.69 (SD=8.65); however, due to high standard deviations, one must use caution in the analysis. The lowest unaided recall score occurred in the Spanish electronic text treatment group with an average score of 65.94 (SD=4.45). Table 2 provides data for each treatment group.

Table 2
Summary of unaided recall for treatment groups.

				95% Confidence Interval	
Treatment	M	SD	SE	Lower	Upper
English Print	14.69	8.65	2.29	10.15	19.22
Spanish Video News Release	14.50	10.88	2.29	9.97	19.04
English Video News Release	14.00	11.25	2.29	9.47	18.55
Spanish Radio News Release	14.06	7.63	2.29	9.53	18.60
English Radio News Release	10.00	8.23	2.29	5.47	14.54
Spanish Print	9.25	10.65	2.29	5.41	13.51
English Electronic Text	8.38	11.47	2.29	3.84	12.91
Spanish Electronic Text	5.94	4.45	2.29	1.40	10.47
Control	0.00	0.00	2.29	0.00	0.00

SE – Standard Error

Research Null Hypothesis One

$H_0 1$: Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit no statistical differences in aided recall of local agriculture policy news.

The following research hypothesis was developed *a priori* at the _ = .05 level.

$$H_0 1: \ \__1 = \__2 = \__3 = \__4 = \__5 = \__6 = \__7 = \__8$$

$$H_a 1: \ \__1 \neq \__2 \neq \__3 \neq \__4 \neq \__5 \neq \__6 \neq \__7 \neq \__8$$

As stated above, the null hypothesis of no differences being expressed between English newspaper print ($\__1$), Spanish newspaper print ($\__2$), English electronic text ($\__3$), Spanish electronic text ($\__4$), English radio news release ($\__5$), Spanish radio news release ($\__6$), English

video news release (_7), and Spanish video news release (_8), or there was no treatment effect in comparison across group means on a low-level aided recall posttest. The alternative hypothesis states significant measurable differences would be evident due to media presentation.

An analysis of variance (ANOVA) tests the null hypothesis of no difference in aided recall between English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release treatment groups. Table 3 summarizes the results of an ANOVA used to test the hypothesis of no difference between the treatment groups.

Table 3
Analysis of variance comparing English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release treatment groups on aided recall scores

Source	SS	df	MS	F	p
Between	1.63	8	19.59	7.28	.000*
Within	3.77	135	0.20		
Total	5.39	143			

**significant at _ = .05*

The obtained omnibus F (8,135) = 7.28, p = 0.00 was significant; therefore, the null hypothesis of no difference in aided recall between English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release treatment groups was rejected. The strength of the relationship between the dependent variable of aided recall and the independent variable of media was strong. Eta squared, __, was strong, with the treatments accounting for 30% of the variance for the dependent variable.

A post-hoc was then used to determine the location of the significance. The Levene's test for equality of variances for unaided recall was not significant; therefore, the assumption of homogeneity of variances was satisfied (Kirk, 1995). As a result, a Tukey post-hoc comparison

was used to locate significant mean differences. Table 4 presents the results from the Tukey post-hoc comparison.

Table 4
Tukey post-hoc comparison of English newspaper print (ENP), Spanish newspaper print (SNP), English electronic text (EET), Spanish electronic text (SET), English radio news release (ERN), Spanish radio news release (SRN), English video news release (EVN), Spanish video news release (SVN), and control (C).

	M	ENP	SNP	EET	SET	ERN	SRN	EVN	SVN	C
ENP	0.55	--	0.19*	0.21*	0.30*	0.18	0.18	0.03	0.15	0.35*
SNP	0.35		--	0.02	0.11	0.01	0.02	0.16	0.04	0.16
EET	0.34			--	0.09	0.02	0.03	0.18	0.06	0.15
SET	0.24				--	0.12	0.13	0.27*	0.15	0.05
ERN	0.36					--	0.01	0.15	0.03	0.17
SRN	0.37						--	0.15	0.04	0.18
EVN	0.52							--	0.12	0.32*
SVN	0.40								--	0.20*
C	0.19									--

**p<.05*

Significant differences exist in mean comparisons between English newspaper print and Spanish newspaper print, English newspaper print and English electronic text, English newspaper print and Spanish electronic text, and English video news release and Spanish electronic text. The control group also indicated significant differences with English newspaper print, English video news release, and Spanish video news release. Although the mean scores of all treatment groups were higher than the control, the mean differences were not significant for control and Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, and Spanish radio news release.

The analysis indicated an observed power of 0.91. A power greater than 0.80 is considered acceptable (Kirk, 1995). When the study is replicated, it is recommended researchers refer to Tang's chart (Kirk, 1995, p. 814) in order to obtain the minimum number of subjects for the desired power. In order to achieve a power of 0.80 when replicating this study, Tang's chart recommends a minimum sample size of 12 (n=12) for each treatment group.

Research Null Hypothesis Two

$H_0$2: Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit no statistical differences in unaided recall of local agriculture policy news.

The following research hypothesis was developed *a priori* at the _ = .05 level.

$$H_0 2: \ \_1 = \_2 = \_3 = \_4 = \_5 = \_6 = \_7 = \_8$$

$$H_a 2: \ \_1 \neq \_2 \neq \_3 \neq \_4 \neq \_5 \neq \_6 \neq \_7 \neq \_8$$

As stated above, the null hypothesis of no differences being expressed between English newspaper print ($\__1$), Spanish newspaper print ($\__2$), English electronic text ($\__3$), Spanish electronic text ($\__4$), English radio news release ($\__5$), Spanish radio news release ($\__6$), English video news release ($\__7$), and Spanish video news release ($\__8$), or there will be no treatment effect in comparison across group means on a low-level unaided recall posttest. The alternative hypothesis states significant measurable differences will be evident due to media presentation.

The Levene's test for equality of variances for unaided recall was significant; therefore, the assumption of homogeneity of variances was not satisfied (Kirk, 1995). The null hypothesis that the error variance of the dependent variable is equal across all groups is rejected. Table 5 reports Levene's test for equality of error variances.

Table 5
Levene's test for equality of error variances for unaided recall

F	df1	df2	Sig
6.63	8	135	.000

The reported standard deviations for the means were significantly high as well. As a result, unaided recall was not used in mean comparisons. The results of the correlational

analyses presented in Table 6 illustrates the correlation of aided and unaided recall as statistically significant (r= .51).

Table 6
Correlations among the three dependent measures

	Aided recall	Unaided recall
Aided recall	--	0.51*
Unaided recall	0.51*	--

**p<.0166*

The correlation of aided recall and unaided recall was substantial. This validated the close association between the recall measures used in the study.

Conclusions

Demographics

In this study, 92% of the participants reported being born in the U.S. The national average is between 55% and 60%. However, the percentage of West Texas Hispanic/Latinos born in the U. S. is around 85% (U.S Census Bureau, 2000c). Ninety-two percent of the participants in this study were born in the U. S. As a result the generalization of the sample of participants at the Raiders Rojos Back to School Fiesta to the actual population of West Texas Hispanic/Latinos is strengthened.

Research Hypothesis One

Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in aided recall of local agriculture policy news.

The results from this study indicated a statistical significance in aided recall for English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release. A post-hoc test identified the significant mean separation among treatment groups.

Significant differences existed between English newspaper print and Spanish newspaper print, English newspaper print and English electronic text, English newspaper print and Spanish electronic text, and English video news release and Spanish electronic text. The control group also indicated significant differences with English newspaper print, English video news release, and Spanish video news release. Although the mean scores of all treatment groups were higher than the control, the mean differences were not significant for control and Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, and Spanish radio news release.

These findings are consistent with the literature, which expresses print superiority with adult populations (Furnham & Gunter, 1985). Furthermore, these findings are similar to cross-cultural studies pertaining to recall and modality (Facorro & DeFleur, 1993). Again, literature specific to Hispanic/Latino populations and modality recall was not evident in the extensive literature review.

Research Hypothesis Two

Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in unaided recall of local agriculture policy news.

Because the Levene's test for equality of variances for unaided recall was significant, the assumption of homogeneity of variances was not satisfied (Kirk, 1995). The null hypothesis that the error variance of the dependent variable is equal across all groups is rejected. Conclusions from this hypothesis are not tenable; however, the correlation (r=.51) between aided and unaided recall supports the accuracy of the two measures used in the study.

Discussion

Descriptive

The means reported in the aided recall portion produced an interesting order. The highest mean recall score resulted from the English print treatment group. The rest are ordered as follows: English video news release, Spanish video news release, Spanish radio news release, English radio news release, Spanish print, English electronic text, and Spanish electronic text. The qualitative data from the unaided recall measure were coded, and the means resulted in the following order from highest to lowest: English print, Spanish video news release, English video news release, Spanish radio news release, English radio news release, Spanish print, English electronic text, and Spanish electronic text. It is interesting how mass media research often contradicts educational research, which claims dual-coding as a significant factor in recall. If this is the case, why does print continue to express higher recall among adult populations?

The design of this study was experimental in nature, thus the low sample size (n=144). The researcher realizes caution must used when generalizing these results as descriptive to the general Hispanic/Latino population of West Texas. Although the characteristics of participants resembled the characteristics of the West Texas Hispanic/Latino population, one must yield caution when generalizing the findings in the study.

Inferential

The mean scores of unaided recall could not be compared and contrasted due to homogeneity of variances issues. However, the aided-recall portion of the dependent measure produced tenable results. The post-hoc test revealed English newspaper print as significantly better than Spanish newspaper print, Spanish electronic text, and English electronic text. Furthermore, the post-hoc revealed English video news release as significantly better, in terms of cognition, than Spanish electronic text. When these cognitive results are associated with the agenda-setting theory, it is important to place printed publications pertaining to the importance of agriculture in the hands of individuals who will consciously read them. It also is interesting to look at the significance of the English video news release, especially when it is associated with the media consumption variable.

The linear relationship between aided recall and unaided recall not only strengthens the findings of the aided recall portion of the measure, it adds credibility and validity to multiple-item instruments used in media research. It also is important to consider the strength of the relationship ($r=0.51$).

Based on this study's findings and conclusions, recommendations for practitioners and for further research have been made.

Recommendations for Practitioners

Literature pertaining to media campaigns strongly encourages an in-depth needs assessment when addressing any population through mass channels. Media campaigns are much too complex to associate one particular channel to cognitive gain, affective change, and overall behavior intent; however, one must heavily consider research pertaining to media effectiveness as the population is assessed.

It is recommended by the researcher that media campaign developers and practitioners consider outcomes of this study when addressing the Hispanic/Latino population of West Texas, especially as it relates to agricultural issues. Listed below are recommendations for addressing the Hispanic/Latino population of West Texas on agricultural issues. These were generated by the researcher as a result of the literature review and study results.

1. Use a variety a media channels when possible. There is a direct correlation between channel diversity, exposure time, and overall campaign effectiveness.
2. When limited to cross-cultural, non-specific targets, keep in mind the limited consumption and overall ineffectiveness of Spanish language printed material. However, the Hispanic/Latino culture considers these sources as highly credible.
3. Because of limited consumption time and a lack of overall cognitive effectiveness, direct resources away from electronic text channels, especially when seeking Hispanic/Latino adult populations of West Texas.
4. As the Hispanic/Latino population of West Texas becomes more acculturated, cultural-specific campaigns, as it pertains to channel and language, become less important. Resources are better spent by campaign planners and practitioners who concentrate on cultural-specific content.

Again, an in-depth, comprehensive needs assessment is recommended by the researcher when planning or facilitating any mass media campaign, especially when specific or cross-cultural populations are targeted. It also is suggested practitioners stay informed and educated on current trends of media effectiveness research and theory.

Recommendations for Further Research

First, it is recommended this study be replicated to determine if the current study's findings are consistent. Replications should take place in various Hispanic/Latino settings in West Texas. Also, replications should be performed with extended treatment periods, similar to a 30-minute news program. Because of the strong correlation of unaided and aided recall scores, it is recommended to discontinue unaided recall replication in order to perfect aided recall measurement. In order to measure delayed recall, it is important to solicit a population that can easily be contacted after an extended period. Delayed recall by mail survey was attempted in this study, but due to a low response rate and the resulting unequal treatment groups, statistical analysis could not be conducted on this measure.

Finally, it is recommended the study be replicated with a Caucasian population in West Texas. This would yield insight to cross-cultural associations of mass media effectives and consumption. Facorro and DeFluer (1993) provide evidence that people of different societies and cultures learn from news differently, even when content and conditions of exposure are identical.

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Syndicating Agriculture News With RSS

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ABSTRACT

Rich Site Summary, also known as Really Simple Syndication (RSS), is a technology used to distribute news and information from a Web site. RSS is a particularly useful tool for news organizations since these syndication feeds automatically notify the end-user that fresh information has been posted to a Web site. It also avoids the use of e-mail.

This innovation can be an effective way to distribute news releases and breaking news items. Instead of clicking on a Web site to see if fresh content has been posted, individuals that have news reader software programs running on their desktop computers receive the information as soon as it's posted to the Web.

Texas A&M Agricultural Communications, one of the early adopters of RSS, began implementing a RSS feed in September 2003 and received national attention for this innovation in the February 2004 edition of *The Chronicle of Higher Education*.

Since implementing a RSS feed on the http://agnews.tamu.edu Web site, more than 625 additional hits have been recorded each month. The new technology also has been discovered by journalists, who are finding RSS a much faster method of receiving news and story ideas.

Syndicating Agriculture News With RSS

Introduction

Rich Site Summary, also known as Really Simple Syndication (RSS), is a technology used to distribute news and information from a Web site. RSS is a particularly useful tool for news organizations since these syndication feeds notify the end-user that fresh information has been posted to a Web site.

This innovation can be an effective way to distribute news releases and breaking news items without the use of e-mail. Instead of clicking on Web sites to see if fresh information has been posted, individuals download a free or fee-based news reader software program of their choice. This software program runs separately from other applications on the desktop.

With the news reader program, users can subscribe to news sites who offer RSS feeds. By entering the RSS feed URL into the news reader program running on the desktop, the application automatically fetches fresh content that has been posted to a Web site. No longer does a user have to manually check these sites for new information.

Major newspapers and wire services have adopted RSS technology, including *The New York Times*, *The Wall Street Journal*, *Reuters*, *The Boston Globe* and *Yahoo! News*.

"(RSS is) spawning a content revolution that is only now beginning to be understood and appreciated," said Dan Gillmor, in his book, *We The Media: Grassroots Journalism By The People, For The People*. "It could well become the next mainstream method of distributing, collecting, and receiving various kinds of information."

Texas A&M Agricultural Communications, one of the early adopters of RSS, began implementing a RSS feed in September 2003. Having no previous computer programming experience, the author read reference materials on Web sites, collected books from the campus library, and also studied content made available by Dave Winer, former chair at the Berkman Center for Internet and Society at Harvard University.

Winer is considered the father of RSS, having developed the technology while working at Netscape in the late 1990s. He is also author of the popular Weblog, *Scripting News* (http://www.scripting.com).

Methods/Process

The actual RSS news feed file consists of a short synopsis of news articles in chronological order by date and a link to where the news article resides on the server.

To view an RSS feed, end-users must be running a news reader program. Several free news reader software programs are available for download on the Web. For the PC, those include:

Sharpreader (http://www.sharpreader.com),

Feedreader (http://www.feedreader.com)

and NewsGator (http://www.newsgator.com).

For the Apple Macintosh, the most popular news reader program is distributed by Ranchero called NetNewswire (http://www.ranchero.com).

Once the RSS feed resides on the server, a link and an orange XML button is placed on the Web site. When the end-user sees these elements, they can copy the link and paste it into their newsreader program and subscribe to the RSS feed. (See Figure 1)

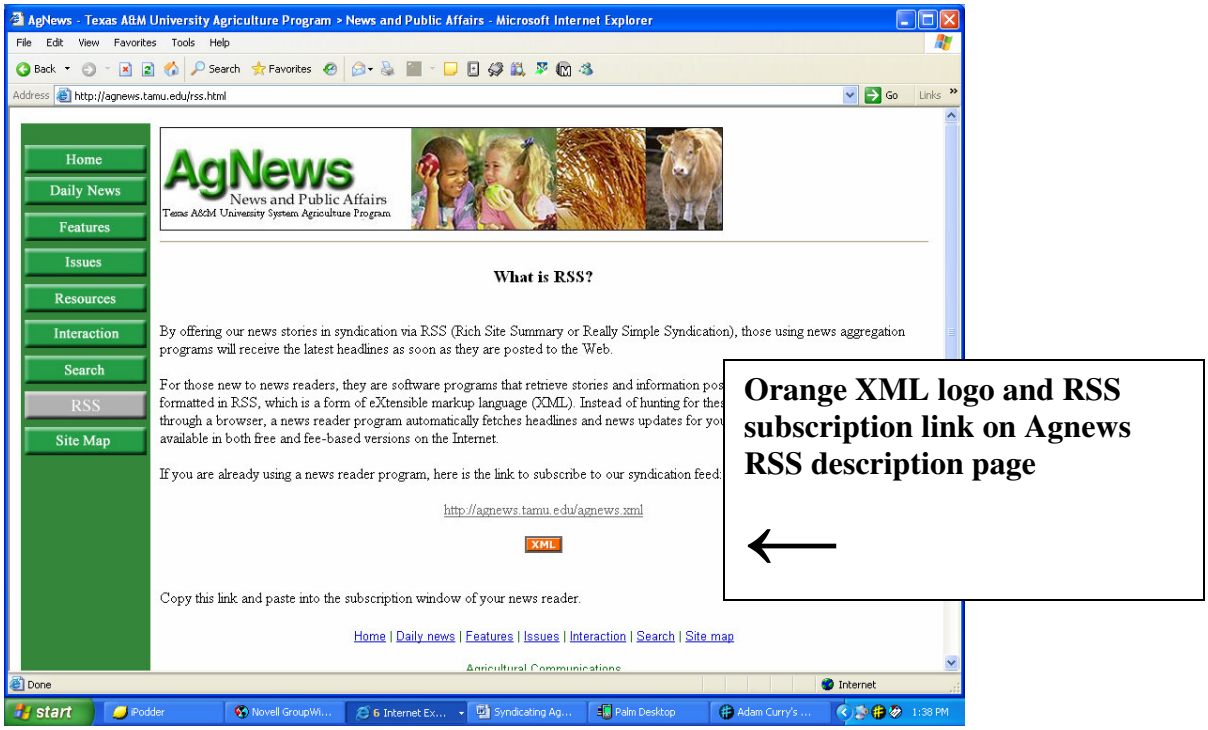

Figure 1: Texas A&M AgNews RSS description page at http://agnews.tamu.edu/rss.html

A newsreader program allows the user to subscribe to multiple RSS feeds at once. (See Figure 2, Page 5)

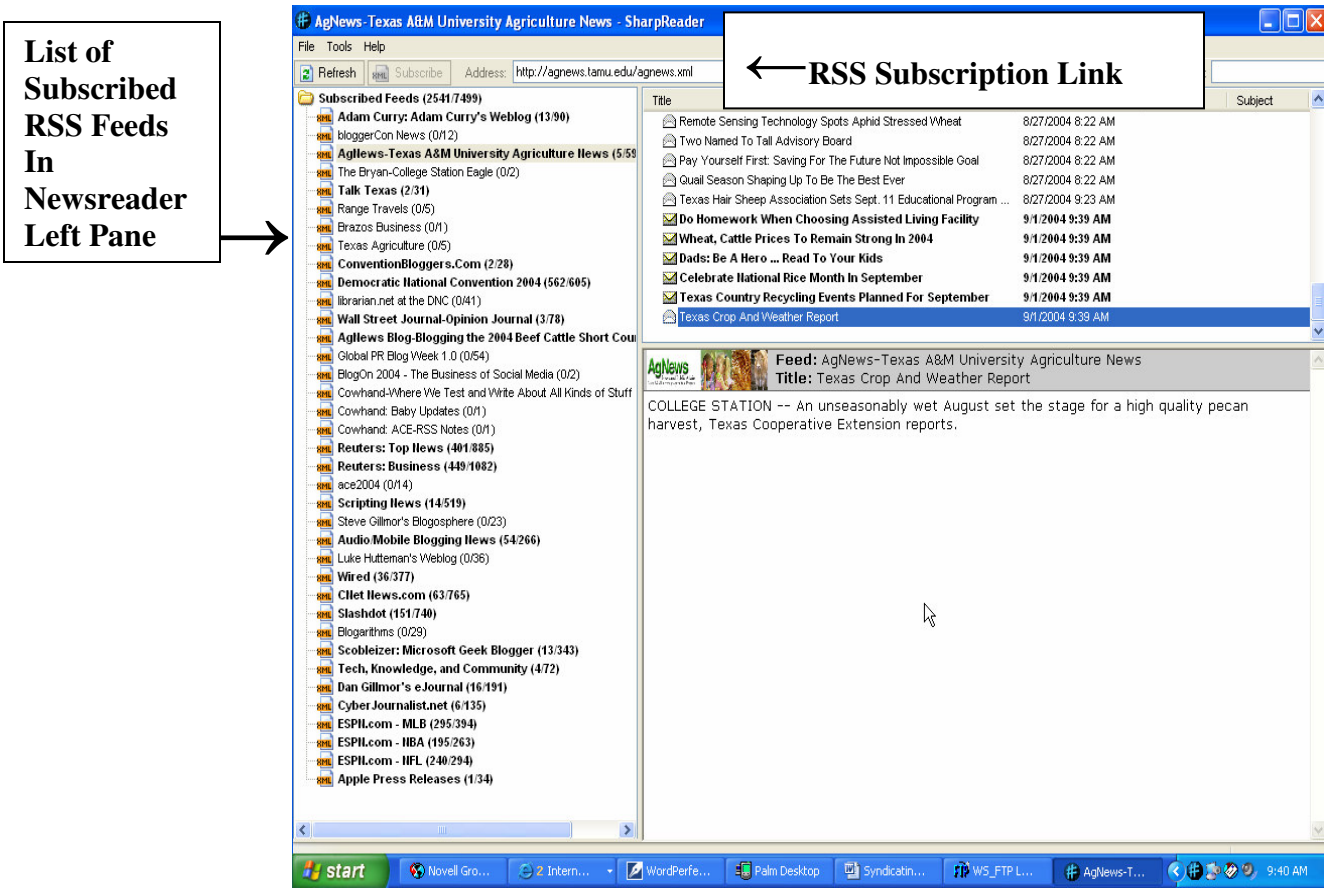

Figure 2. List of subscribed RSS feeds in Sharpreader newsreader program

RSS feeds provide flexibility as well. If a user finds that the RSS feed isn't providing news and information of their liking, they can simply "unsubscribe" to the RSS feed by deleting the feed from their newsreader program.

The following is an example of Texas A&M Agricultural Communications' RSS feed displayed in a newsreader program. (Figure 3, Page 6)

Figure 3: Texas A&M AgNews RSS Feed with Web page displayed in newsreader program

In Figure 3, four news stories are displayed from Texas A&M Agricultural Communications in the title pane. They are also dated. Each time the user clicks on a headline, the Web page is displayed in the viewer pane as shown with the news story, "Extension Beef Economist To Retire Amid Steady Prices, Demand." This allows the user to quickly scan a list of news stories without ever using a browser.

As shown in the same illustration, the user can scan other sites with the software program. It is conceivable that a user could scan as many as 25 news sites in a short amount of time without ever opening a browser. RSS brings the news to the user.

Perhaps the best feature about RSS is its affordability. Many land-grant institutions already serve information in HTML on Web sites. Anyone with a server and who can code a RSS feed to specification can implement this technology without additional expense. This is an important factor considering the fiscal requirements of many land grant universities. The only investment on the part of Texas A&M

Agricultural Communications was the author's time devoted to research and writing code. This was done in between daily tasks of writing news stories, answering media calls and other responsibilities.

To form a RSS feed and place the file on a server, the information is formatted into a programming language called Extensible Markup Language. This is more commonly referred as XML. To code the feed, the content developer can create the feed as simple as opening a Notepad document on the PC or a Text edit document on the Apple Macintosh.

Texas A&M Agricultural Communications' RSS feed includes the following code elements:

<title> The name of the RSS feed

<link> Points to the URL of the home page

<description> What the RSS Feed is about

<item> Refers to the RSS entry

<title> Headline of the news item

<link> URL to where the news item resides on the server

<description>Brief description of what the news item is about, usually the first paragraph of the news story. (See RSS code example in Figure 4, page 8.)

There are three ways to code a RSS feed by using the standard specification: 0.91, 0.92 and 2.0. These specifications can be found at http://blogs.law.harvard.edu/tech/rss#whatIsRss . Texas A&M Agricultural Communications serves a 0.91 RSS feed.

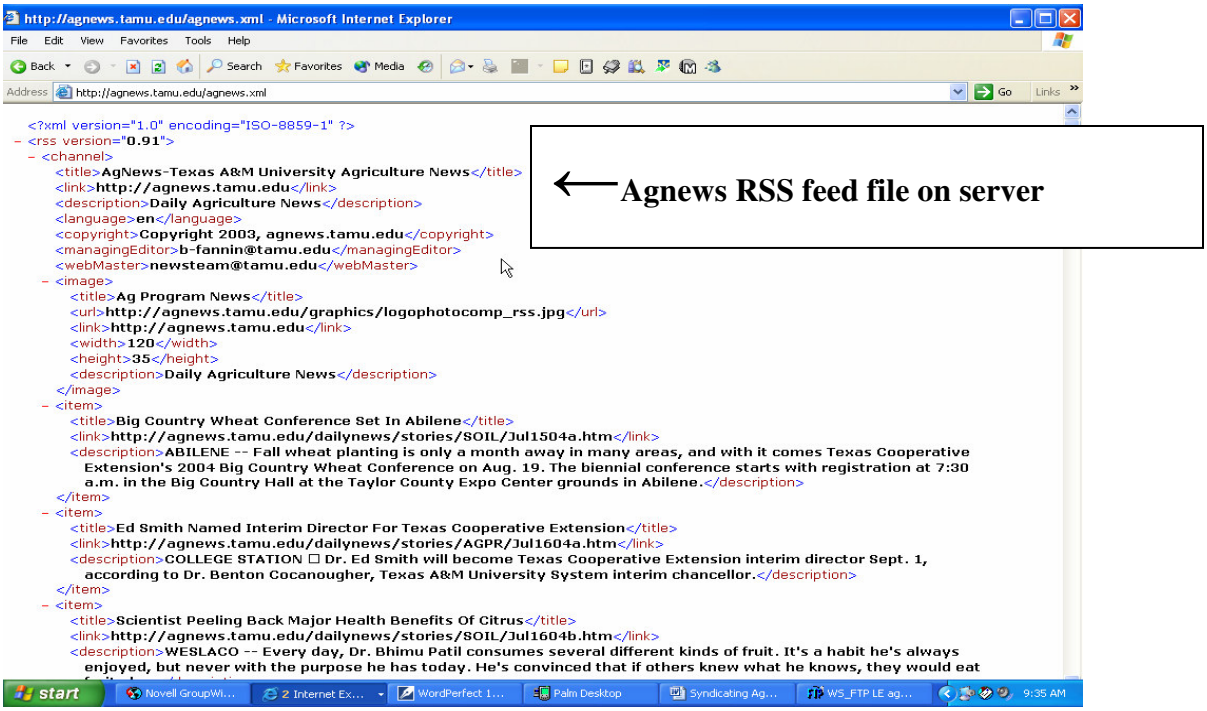

Figure 4: Texas A&M AgNews RSS 0.91 Feed and Code File Displayed On Server

Results/Outcomes

The RSS project has led to increased awareness both from the general public and from the farm press.

The new innovation captured the attention of *The Chronicle of Higher Education*, which profiled the Texas A&M project in its February 13, 2004 edition. Farm Journal's *Beef Today* is currently using the RSS feed to receive Texas A&M Agriculture Program news in addition to traditional e-mail distribution.

Steve Cornett, editor of *Beef Today*, said "(RSS) is like having an encyclopedia in the bookcase."

Since implementing a RSS feed on the http://agnews.tamu.edu Web site, more than 625 additional hits have been recorded each month. In addition to Steve Cornett with *Beef Today*, Marilyn Pokorney, a freelance writer in New York, recently began using RSS feeds.

"I just started using a RSS reader within the last week. Amazing how these coincidences happen! Anyway, I added your site and read several of the articles. It's a fine idea."

But the majority of the news media and farm press in Texas and abroad have yet to embrace the technology, and in some cases, have never heard about RSS. An online survey distributed in August 2003 to journalists who subscribe to Texas A&M Agricultural Communications' listserv revealed less than 1 percent knew anything about RSS.

However, in August 2004, the author visited with Donnis Baggett, publisher of *The Bryan-College Station Eagle*. The daily is Texas A&M's hometown newspaper. Baggett was introduced to the RSS concept and was demonstrated how reporters at the newspapers could receive Texas A&M Agriculture Program news more quickly.

It was also emphasized how much added value an RSS feed would be to *The Eagle's* Web site. The demonstration included the creation of some sample RSS feeds from a daily edition of the newspaper. Baggett followed up our meeting with the newspaper's online editor, who has since begun looking into launching RSS feeds of their own.

Traditionally, smaller market newspapers are the last to adopt new online technology. It is anticipated that many media outlets in these markets do not measure the effectiveness of these tools until widely adopted.

Perhaps to push the technology to the front of the line, land grant universities can provide education and training to the news media so that both can get their news and information out faster and more efficiently to all audiences.

Discussions/Conclusions

RSS feeds can be used for more than just news distribution. Land grant universities can develop RSS feeds to announce new Extension publications, video and audio releases, promote internal newsletters, etc.

RSS technology has been embraced by Apple Computer Corporation, which will include an RSS feature with their new Tiger OS X operating system to be released in January 2005. Microsoft Corporation has also announced plans to incorporate RSS technology into their new Longhorn operation system to be released in 2006.

RSS can be found in most blogging Web applications. Blogs, or Web logs, are short entries of information displayed in reverse chronological order. To keep track of

fresh posts to blogs, many blogs have their own RSS feeds. These feeds enable readers to subscribe to the RSS feed and keep track of the latest information posted to the Web.

Blogs were in the spotlight for the first time ever at the 2004 Democratic National Convention as media credentials were issued to 35 bloggers. These bloggers, some who had no journalistic background, offered opinions, facts and other relevant information posted to their Web blog instantly. The main attraction of blogs is their immediacy – there is no news cycle. As soon as news breaks, the information can be posted to the blog.

CNN, *The Associated Press* and other media outlets featured Web blogs during their convention coverage. With blogs appearing to gain more popularity by media outlets, RSS will ride the wave of their popularity.

Web References

Specification information for coding RSS files can be found at http://reallysimplesyndication.com .

A complete roundup of RSS sources and implementation of the technology was presented at the 2004 Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Sciences meeting at Lake Tahoe. To view, go to http://www.extension.iastate.edu/mt/ace2004 .

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Blogging Agricultural News: A New Technology to Distribute News Real-Time

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ABSTRACT

Web logging – or blogging as it's called now – is rapidly gaining popularity on the Internet. Much like online diaries, blogs are short text entries posted to a Web site in reverse chronological order. Writers can also feature digital photos, audio and video on their blogs.

That popularity has not gone unnoticed. Several national publications, including *The New York Times* and *The* W*all Street Journal* have adopted blogs on their news Web sites. The main attraction of blogs is their immediacy – readers do not have to wait for the morning's newspaper or the "news on the hour". As soon as news breaks, the information can be posted to the blog.

Having studied this technology's growing popularity, communications specialists at Texas A&M University Agricultural Communications decided to experiment with blogging.

The 2004 Beef Cattle Short Course at Texas A&M August 2004 presented the perfect opportunity to try Web logging and to interest from journalists and non-media consumers. The three-day short course annually draws more than 1,000 ranchers to Texas A&M to hear presentations about the latest developments in cattle research, technology and equipment. In the past, the volume of presentations and information at the short course limited the number of timely news stories generated and distributed from the event.

The blog was used to gauge the amount of news generated by the two communications specialists assigned to cover the event and see if it would be attractive to journalists and non-media consumers.

The experiment included laptop computers and wireless Internet access.

Select journalists were notified to participate in the experiment. They were asked to view the blog and offer feedback. A site meter also kept statistics on the number of visits to the blog.

Blogging Agricultural News: A New Technology to Distribute News Real-Time

Introduction

Web logging – or blogging as it's called now – is rapidly gaining popularity on the Internet. Much like online diaries, blogs are short text entries posted to a Web site in reverse chronological order. Writers can also feature digital photos, audio and video on their blogs.

That popularity has not gone unnoticed. Several national publications, including *The New York Times* and *The* W*all Street Journal* have adopted blogs on their news Web sites. Lev Grossman of *Time* magazine said, "Over the past five years, blogs have gone from an obscure and, frankly, somewhat nerdy fad to a genuine alternative to mainstream news outlets, a shadow media empire that is rivaling networks and newspapers in power and influence."

Blogs were in the spotlight for the first time ever at the 2004 Democratic National Convention as media credentials were issued to 35 bloggers. These bloggers, some who had no journalistic background, offered opinions, facts and other relevant information posted to their Web log instantly. The main attraction of blogs is their immediacy – readers do not have to wait for the morning's newspaper or the "news on the hour". As soon as news breaks, the information can be posted to the blog.

Having studied its growing popularity, Texas A&M University Agricultural Communications decided to experiment with blogging. The co-author[1] had begun a personal blog in January 2004 at Blogger.com, a free blogging provider.

The 2004 Beef Cattle Short Course at Texas A&M August 2004 presented the perfect opportunity to try Web logging and to interest from journalists and non-media

[1] Blair Fannin, Assistant News Editor and Communications Specialist, Texas A&M University Agricultural Communications

consumers. The three-day short course annually draws more than 1,000 ranchers to Texas A&M to hear presentations about the latest developments in cattle research, technology and equipment. In the past, the volume of presentations and information at the short course limited the number of timely news stories generated and distributed from the event.

Select journalists were notified to participate in the experiment[2]. They were asked to view the blog and offer feedback. A site meter also kept statistics on the number of Web visits to the page.

Methods/Process

To blog the event, we first established one at a free service: http://agnewsblog.blogspot.com. Additionally, a free site meter – made available by http://www.sitemeter.com - was added to the site. This tool helped track site visitors, domain registrations and time zones. A link to the blog was also established on the official beef short course Web site, http://animalscience.tamu.edu/ansc/beef/shortcourse/shortcourse.html. The beef short course conference logo was added to the site to enhance the blog's identity.

The blog was edited to include a schedule of events and a link to the site's Really Simple Syndication (RSS) feed. An RSS feed is an eXtensible Markup Language file that includes a site's news content. Consumers who have RSS news reader software programs running on their desktops can subscribe to the RSS feed, receiving notifications when fresh content has been added to a site.

Equipment used for the experiment included two departmental laptops with wireless capabilities, PC (IBM ThinkPad) and Macintosh (Apple Powerbook) platforms, and an Olympus digital audio recorder.

A campus map helped us locate the several wireless hotspots in Rudder Tower at Texas A&M University, the location of the short course. The bottom floor site was a student dining area, complete with tables and chairs. Wireless signal strength was strong

[2] Karl Wolfschohl, Progressive Farmer; Richard Smith, Waco Tribune-Herald; Beverly Moseley, Land & Livestock Post; Lori Cope, Country World News; Donnis Baggett, The Bryan-College Station Eagle; Joe Roybal, BEEF magazine.

throughout the event. Blogging could be done quickly and efficiently, without a long walk back to our building to have access to computers and the Internet.

We each picked presentations during the short course we were to cover and met during mid-morning breaks to edit and post our content. We took turns editing each other's copy and then posted our entries.

Blogger.com offers a simple, easy-to-use Web interface to post entries. (See Figure 1). Once the user has entered the correct login identification and password, another Web interface appears. The user is given an option of entering a subject title and alternate link. A text area is provided for writing the body copy, with options given for bold, italic and hyperlinking text.

Figure 1:

The user is allowed to preview the entry before clicking the "submit" button to post the entry to the Web site. (See Figure 2)

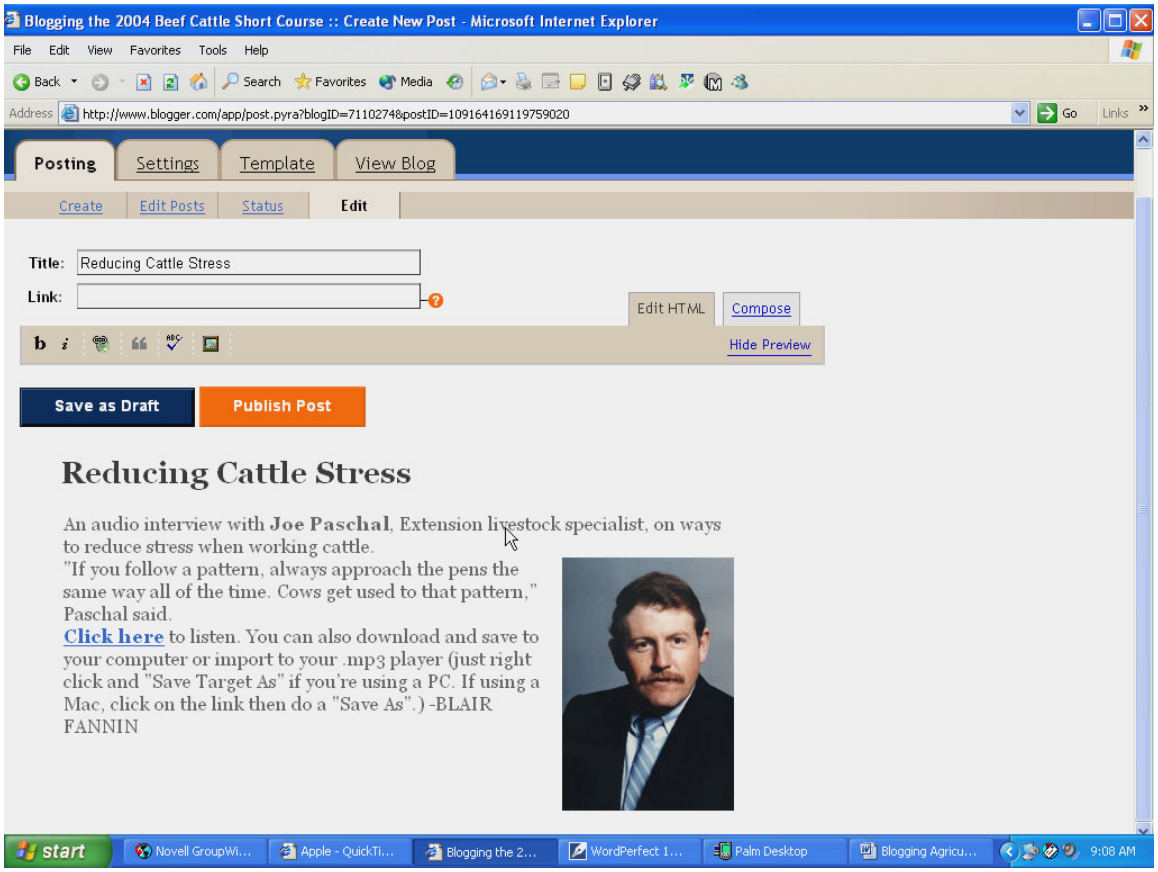


Figure 2

At least one external Web link was included in a blog entry. According to Mark Gibson in an article on Web logs in the newsroom, "… news sites should not fear that they'll lose tons of traffic by linking to outside sites from their blogs. Keep the readers in mind, and try to be of service to them. That will bring them back on a regular basis." (Online Journalism Review, Sept. 24, 2003.)

Audio interviews were imported from the digital audio recorder to iTunes loaded on the Apple Powerbook. The audio file was then compressed from an .AIFF file to an .mp3 file. The audio files were all captured in one take with the subject. The interviews typically were six to 14 minutes in length. The audio interviews were hosted on an alternate server, http://cowhand.tamu.edu, which is an Apple Macintosh G3 computer used in the co-author's[3] office for development exercises.

[3] Blair Fannin, assistant news editor and communications specialist, Texas A&M University Agricultural Communications

Results/Outcomes

Little advance publicity of the site was done except for personal contacts with journalists and co-workers and the link on the Beef Cattle Short Course Web page. Our initial idea was to use the blogging experience as only an experiment. We wanted to see if this new technology would work before trying this on a larger scale.

A free site meter, provided by http://www.sitemeter.com kept track of site visits. It tracked 187 visits and tabulated 245 page views. There were 37 site visitors on August 2, the first day of day of the short course. Of those visits, 4 percent were from Germany and 1 percent from Australia, indicating our audience reached internationally. (See Table 1)

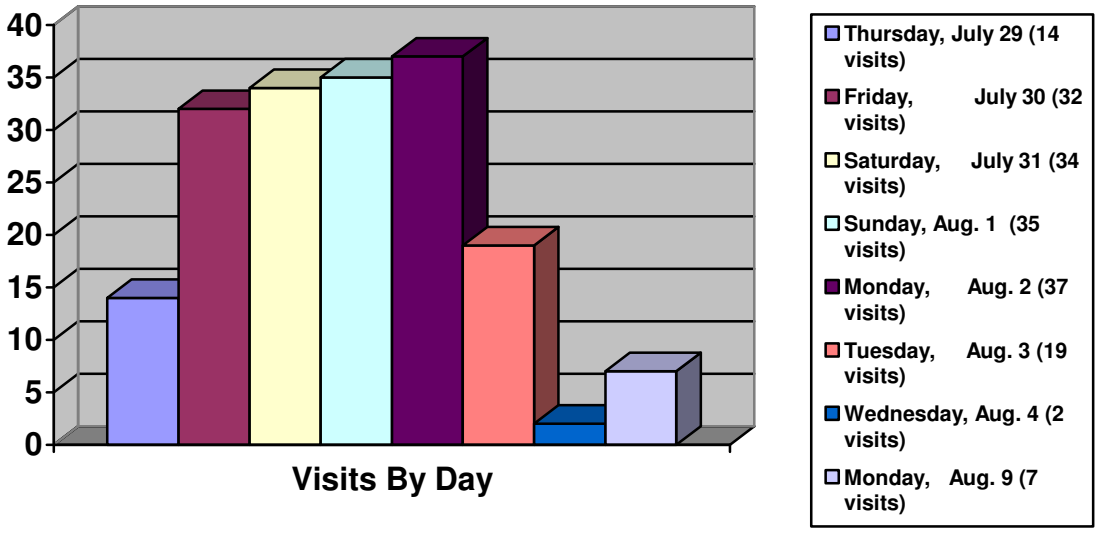


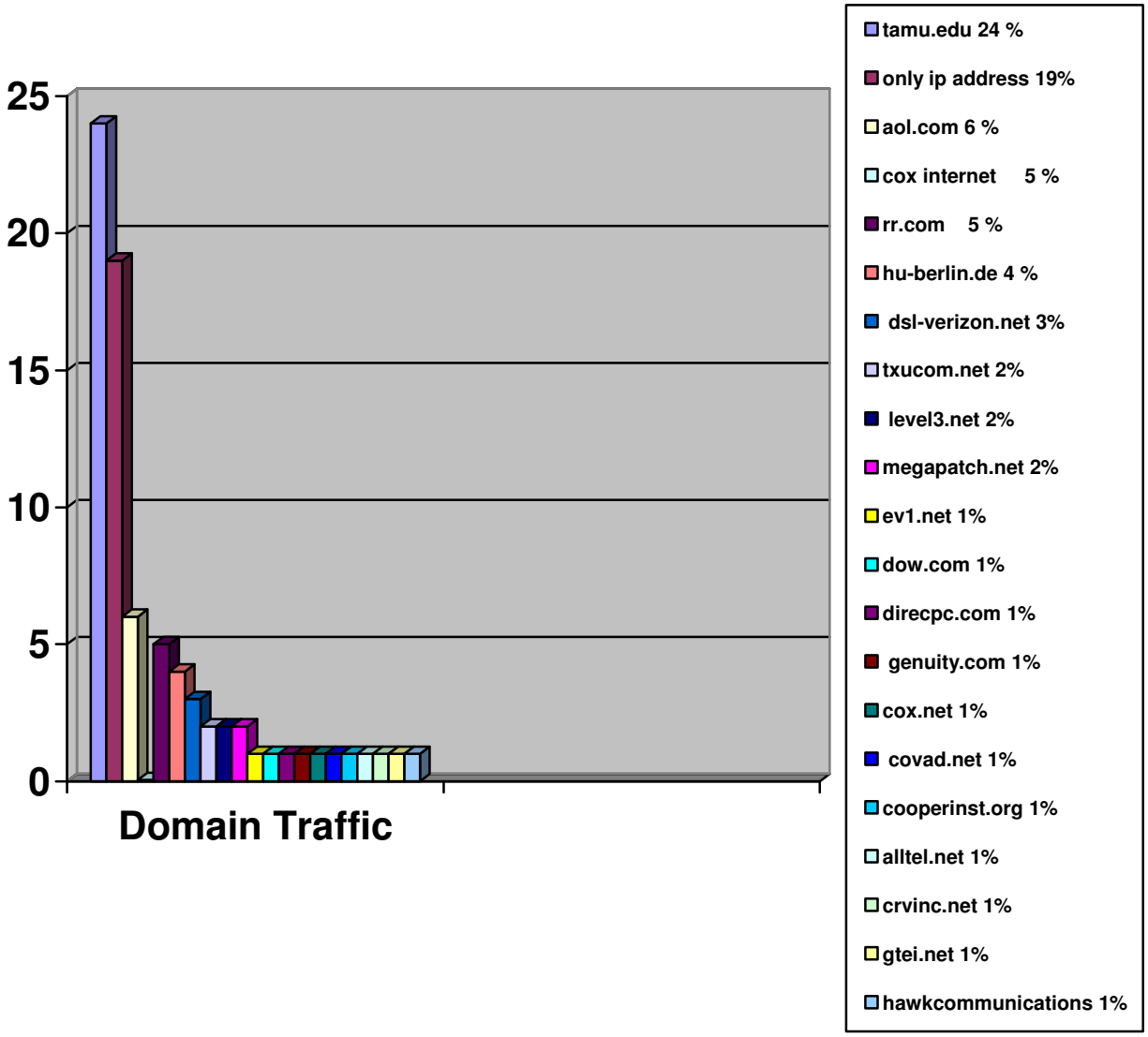
Table 1: Visits by Day

The site meter also tallied visits by domain. Our co-workers at Agricultural Communications were asked to monitor the site and offer feedback in addition to the invited journalists. Site visitors also included those re-directed from the beef short course Web site.

Twenty-four percent of the domain traffic was from tamu.edu, but also included visitors from the university's animal science department. Nineteen-percent of the site visitors were external visitors with their own IP address.

AOL.com represented 6 percent of the domain traffic, while Cox Internet and Roadrunner Internet service providers represented 5 percent of the domain traffic. (See Table 2: Domain Tracking)

Table 2: Domain Tracking



The site meter also tracked operating systems. Fifty-seven percent of the operating systems were Windows XP, while 18 percent were Windows 2000. Windows 98 represented 8 percent, while Windows Millenium (5 percent), Windows NT (4 percent), Macintosh Power PC (4 percent), Mac OS X (2 percent), Windows Server 2003 (1 percent) and Windows 95 (1 percent) rounded out the list. (See Table 3: Operating Systems)

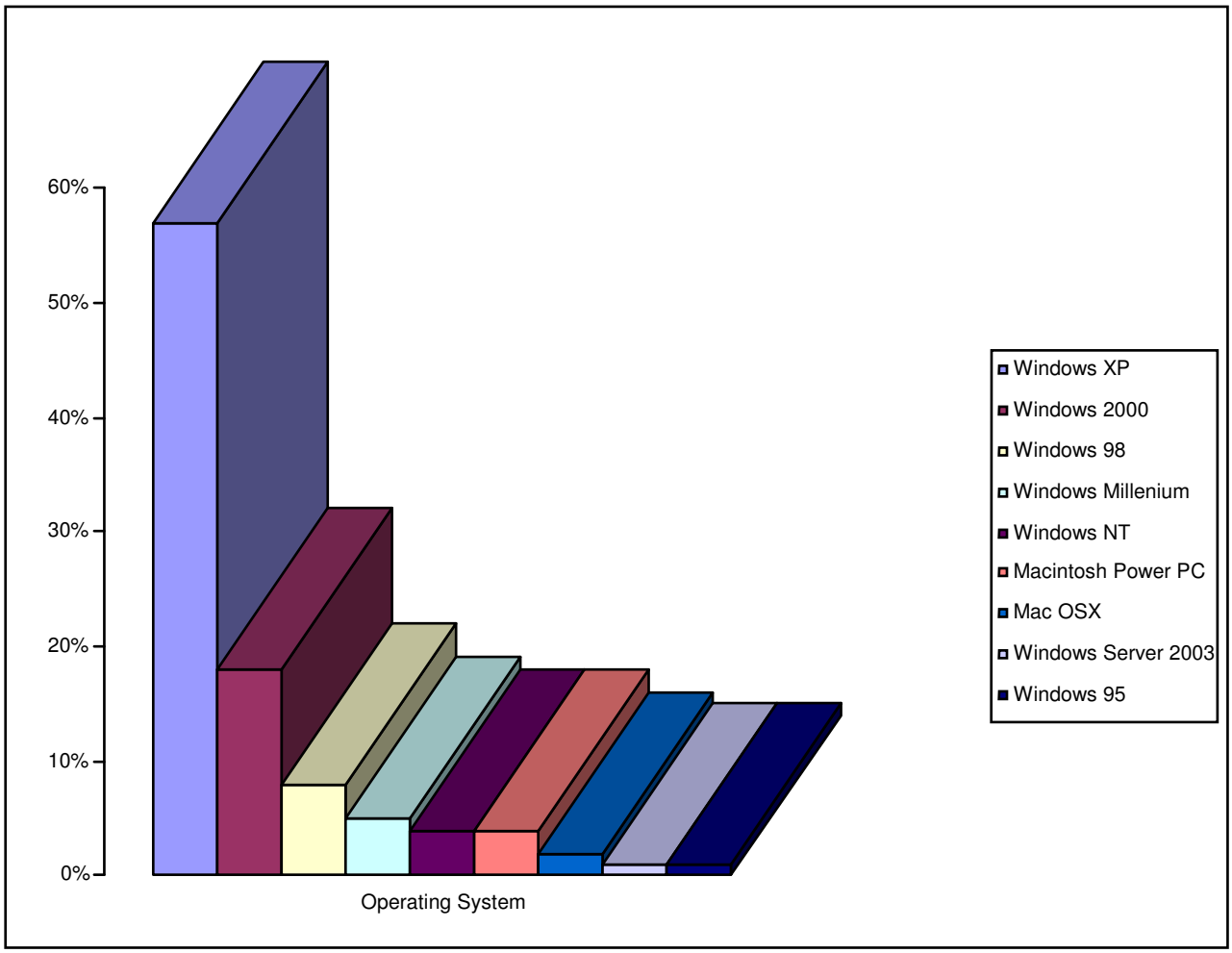


Table 3: Operating Systems

Journalists and co-workers offered feedback while visiting the site. Richard Smith, environmental reporter with the *Waco Tribune-Herald*, said, "News-wise the main features such as what to look for in buying a bull or rebuilding a bull herd all seem like they could be attractive stories for a farm and ranch writer, even though I only broach those subjects from an environmental standpoint. Overall, the blog looks like it could be a very useful communication vessel on several levels."

Lori Cope, an editor with *Country World*, an agricultural publication, said "I didn't even know what a 'blog' was; but now I know it's a good thing. You guys did a great job covering the events, and 'blogging' the information."

After the completion of the experiment, we have concluded blogging will be a useful tool for future news events. Blogging a news event offers many advantages: it allows for instant posting of news and information; audio interviews and digital photos can be incorporated into the Web log; e-mail addresses offer a place for reader feedback and posting comments.

The site was set up so that readers could post entries. This feature allows the audience to be drawn into the conversation of the blog. A reader could tip the reporter on a news angle that hasn't yet been covered while attending the news event, or ask a question the reporter may have not thought about.

Blogging has set a new stage for reader feedback. In the past, newspapers and magazines have printed their news and delivered it in "fish-wrapping." With blogs, online readers can instantly post feedback, and the coverage of a news event can change instantly rather than waiting for the next day's news cycle. Blogs can also draw more traffic to other Web sites. Using links to news articles or other information on the Web, they send more visitors to sites.

We are now planning to "blog" next year's Short Course, agricultural summits, Extension field days to provide producers instant access to news and information coming out of these events.

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It Takes Two: Public Understanding of Agricultural Science *and* Agricultural Scientists' Understanding of the Public

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ABSTRACT

This study examined the beliefs agricultural scientists have about the public understanding of agricultural science and science, in general. A stratified random sample of members of the Southern Association of Agricultural Scientists was taken, with a response rate of 20.6%. Respondents said that the public does not understand the respondents' particular agricultural discipline or science in general. Respondents indicated that it is their responsibility to help people understand their agricultural discipline, but they indicated less responsibility for helping people understand science in general. Similarly, respondents were more willing to work with reporters and to receive media relations training if it helped people understand their agricultural discipline than if it helped people understand science in general. Respondents agreed that they would receive media relations training if they believed it would benefit them personally or their university. While respondents agreed that it is their responsibility to help people understand their agricultural discipline, they were less convinced in their colleagues' conviction of this responsibility.

KEYWORDS: science communication, public understanding of science, agricultural science, agricultural scientists, journalists, science literacy

Introduction

Public Awareness and Understanding of Science

The current relationship between science and the public has caused increased concern from the scientific community (Gregory & Miller, 2004). This concern stems from the public's lack of awareness, knowledge, and understanding toward science issues. Individuals learn about science in formal and informal settings. In each of these settings, individuals develop attitudes about and knowledge of science. Differentiating attitudes and knowledge, researchers have distinguished public awareness of science from public understanding of science.

Public awareness of science, according to Gilbert, Stocklmayer, and Garnett (1999), refers to the development of positive attitudes toward science and technology. These attitudes manifest in various skills and behavioral intentions. In contrast, Bryant (1998) defines public understanding of science as "the comprehension of scientific facts, ideas and policies, combined with a knowledge of the impact such facts, ideas and policies have on the personal, social and economic well-being of the community" (p. 2).

Previous studies on public understanding of science indicate that science literacy levels are generally low throughout the general public (Hartz & Chappell, 1997; Paisley, 1998). Much research has been conducted on the reasons for this science illiteracy, which include lack of science background or knowledge by news media, news-gathering norms, editorial pressures on journalists, the failure of scientists to communicate with the public, and the public's lack of interest in science information (Treise & Weigold, 2002). Research on the perceptions and attitudes of scientists toward the public in the science communication argument is relevant to the science literacy debate.

Shaping a science-literate public is the responsibility of many; however, information dissemination must start with the source and, in this case, the source is the scientist. Therefore, public understanding of science is directly affected by scientists' willingness to share science information. Understanding the attitudes, opinions, and perceptions of scientists toward science communication can be important for professional communicators, as they are commonly the link between scientists and the public.

Blaming the science-illiterate public on scientists alone excludes other influential players within this debate. For example, Gregory and Miller (2004) suggest that "the media do provide a forum in which the relationship between science and the public is constructed and pursued, and it is in this forum that the public makes moral judgments about science" (p. 1). Although the media often facilitate relationship-building between scientists and the public by serving as an intermediary, the inclusion of the media in the science/public relationship inevitably adds complexity to the science communication process.

Scientists, public information officers, and the media comprise a diverse group of individuals attempting to communicate scientific topics to the public. Gregory and Miller (2004) present the challenge diverse groups cause when dealing with the public understanding of science:

> Each of them – science, the media, and the public sphere – represents for the inhabitants of the other two a largely unknown land. Like unworldly tourists these groups are inclined to believe that if they speak their own language slowly and loudly, they will make themselves understood; sometimes, like imperialists in an annexed land, they presume that everyone else is a savage. Just as travelers abroad have learned to understand another culture on its own terms, so might scientists, journalists and the public tread a little more lightly on each other toes if they got acquainted first (p. 5).

Despite the apparent differences of these key players – scientists, media, and the public - in the science communication discussion, they each have a significant responsibility in establishing and

maintaining a science-literate society. However, sometimes these responsibilities are hindered by the skills and even attitudes that these groups possess.

Most scientists bear the responsibility and recognize the importance of communicating their research and scientific findings to a broader audience; however, most are ill-equipped to accomplish this daunting task. Communicating to audiences outside of the scientific community can be intimidating for scientists due to their lack of media relations knowledge, skills, and experience. Relying solely on the media to disseminate science information to the public presents a problem, however, because the objective of the news media is not to improve public understanding of science (Gregory & Miller, 2004). Simply stated, journalists are not educators.

If scientists desire greater public understanding of science, the responsibility for seeking out science information cannot necessarily be shifted to the public. Research indicates that most individuals are interested in science information; however, that does not equate to their understanding or appreciation of science (Gregory & Miller, 2004; Treise & Weigold, 2002; Hartz & Chappell, 1997).

Despite the differing perceptions, knowledge, and responsibilities of these three key players, in the past it is the science communicator that has been expected to provide the link between science and the public. The term "science communicator" includes journalists, public information officers, and scientists, all of whom have a responsibility to communicate to the public about scientific topics (Treise & Weigold, 2002). "Science communication" can be defined as the use of appropriate skills, media, activities, and dialogue to produce awareness, enjoyment, interest, opinions, or understanding of science (Burns, O'Connor, & Stocklmayer, 2003). Numerous benefits result from the role science communicators play in the public understanding of science (Treise & Weigold, 2002), including increased public support,

increased funding for scientific research, enhanced decision-making about scientific topics, improved attitudes toward science, and increased excitement and interest in scientific disciplines.

Who is Responsible?

Public support for science and technology has declined over the years, and this slow decline has been blamed, by some, on the media's inattention to the issues presented earlier, while some argue it is the disinclination of the scientists to communicate scientific information (Hartz & Chappell, 1997). Instead of implicating a specific group that is at fault, Hartz and Chappell (1997) suggested that "at the root of the problem – and the heart of the solution – are those who control the flow of crucial information about the value of basic scientific and technological research; the scientists themselves and the journalists who communicate their triumphs and failures to the American public" (p. xi). While the balance of responsibility between scientists and journalists is unclear, there are negative consequences that result from a science illiterate public for all parties involved.

In a national study of scientists and journalists attitudes towards each other and their views of transmitting science information to the public, Hartz and Chappell (1997) found that both scientists and journalists believe that the American public is often confused and gullible in regard to science issues because of the low levels of science literacy among the general population. This same study revealed that both groups – scientists and journalists – agree that the public does care about scientific issues; however, caring does not equal understanding (Hartz & Chappell, 1997). Additionally, journalists and reporters indicated that the public is so ill-informed on science issues that their opinions about science and technology are not significant in terms of having an effect on funding and policy.

Interestingly, when asked who was most to blame for Americans' misunderstanding of science, scientists and journalists both indicated that scientists are to blame for the low science literacy levels. However, journalists and scientists were also quick to blame the public for its own lack of science knowledge (Hartz & Chapell, 1997).

Since the news media play a significant role in communicating science information to the public, it is important that scientists recognize the importance of disseminating science information to the media as a way to reach the interested public. Nelkin (1995) suggested the following:

> For most people, the reality of science is what they read in the press. They understand science less through direct experience or past education than through the filter of journalistic language and imagery. The media are their only contact with what is going on in rapidly changing scientific and technical fields, as well as a major source of information about the implication of these changes (p. 2).

"Effective science reporting is perhaps the only mechanism for most people to learn about fast-breaking events and exciting developments that affect everyone" (Treise & Weigold, 2002, p. 310). This implies the need for a strong, positive working relationship between scientists and the media in order to have an impact on science literacy.

Scientists have not denied they play an important role within the science communication debate. In 2000, Market & Opinion Research International (MORI) conducted a study of scientists on their own views and experiences on the role of scientists in public debate. Results indicated that scientists felt they are responsible for the dialogue between science and society; however, they feel ill-equipped to do so (Worcester, 2002). "They especially feel unequipped to discuss the moral and ethical issues surrounding their work, and fewer still have had the training to do so" (Worcester, 2002, p. 143). In addition, this same study revealed that nine in ten scientists advocate the communication of the social and ethical implications of science to the

public, seven in ten believe that scientists have the primary responsibility for this communication to the public, yet half of the scientists have not done any communication with the public, due to their feelings of inadequacy for communicating (Worcester, 2002). This lack of media relations knowledge and skills creates a barrier to communication and, as a result, public understanding that fundamentally exists in various fields of science, including agriculture.

Agriculture is Science?

Agricultural communication is one facet of the broad discipline of science communication. Although agriculture is important to America's economic, environmental, and cultural growth, agricultural news is surprisingly a neglected topic in the mass media (Stringer & Thomson, 1999). However, some of the most prevalent science communication issues in the last decade surround agricultural issues.

Recent agricultural issues that have caused heightened public concern include mad cow disease, genetically engineered foods, biotechnology, and animal cloning. These agricultural issues impact all Americans, even those who do not have direct ties to agriculture. Nonetheless, aside from these significant health issues and technological advances in agriculture, media coverage of agricultural issues is minimal, which severely affects the public attitudes and images of agriculture. "Today, the public's image of agriculture is a kaleidoscope of leftover attitudes and images of what agriculture was in the '40s, '50s and '60s" (Coon & Cantrell, 1985, p. 22).

The changes in agriculture and its impact on the American economy make the need for communicating agriculture crucial for creating an agriculturally literate public. "Consumers, as well as policy makers, need to be 'agriculturally literate' in order to respond appropriately as issues arise" (Frick, Birkenholz, & Machtmes, 1995, p. 44). Unfortunately, creating an

agriculturally literate public is challenging; focusing on increased media coverage of agricultural issues, however, is a step in the right direction.

Given the importance of providing scientific information to the public through the news media and the lack of overall agricultural topics in the news resulting in an agriculturally illiterate public, the question of how agricultural scientists perceive the importance of an agriculturally literate public, the coverage of agricultural topics in the news media, and their role, as a scientist, in this communication process needs to be raised. Therefore, the purpose of this exploratory study was to examine the beliefs agricultural scientists have about the public understanding of science. This group of scholars can be considered the gatekeepers of scientific information in agriculture; therefore, it is important to identify their perceptions toward their role, and the importance, the current status, and the key players in the science literacy discussion. It is assumed that understanding the perceptions of this group within the broader science communication discussion will facilitate future media training initiatives as well as improved communication behaviors with this population.

The specific objectives of this study were to survey a sample of agricultural scientists located in the southern region of the U.S. regarding (1) their perceptions of public understanding of agricultural science and science in general, (2) their perceived role in increasing public understanding of agricultural science and science in general, (3) their assessment of their colleagues perceptions of public understanding of agricultural science and science in general, and (4) their assessment of their colleagues perceived role in increasing public understanding of agricultural science and science in general.

Methods

The population for this study was the membership of the Southern Association of Agricultural Scientists (SAAS). SAAS members are academic and professional scientists in the agricultural sector of 13 Southern states in the U.S. To conduct the study, a stratified random sample (n=300) of SAAS members was drawn from the association's online member directory. In order to stratify the sample, the entire SAAS membership directory was first grouped according to scientific discipline (agricultural communications, agricultural economics, agricultural education, agronomy, animal science, biochemistry, horticulture, plant pathology, rural sociology, and soil and water conservation). Only members with complete directory information (name, discipline, and e-mail address) were accessed. Every third member from each discipline was selected to randomize the sample.

The study utilized a 17-item, researcher-developed survey instrument that was descriptive in nature. The instrument included demographics and a set of questions to measure respondents' perceptions of the public's understanding of agricultural science. All items, with the exception of demographics, asked respondents to respond to a set of statements utilizing a five-point Likert-type scale where one equaled "strongly agree" and five equaled "strongly disagree."

Respondents were also asked about the role of the news media in the public's understanding of science. The term "news media" was defined in the survey as referring to all of the communication channels through which news travels to the general public (television, newspapers, radio, magazines, and Internet).

Prior to administration, the survey was reviewed by a panel of experts (including media relations experts) to assure face and content validity. The instrument was subsequently revised to reflect panel members' suggestions. The resulting instrument was pilot-tested with a sub-

sample (n=17) of SAAS members who were not included in the final study. The results of the pilot study were used to further refine the instrument for delivery to the sample for the actual study.

The survey was developed as an online, Web-based survey, using form development and data collection procedures as outlined by Dillman (1999). To initiate the survey, respondents first received an email cover letter informing them about the Web-based survey and providing them with a respondent code to keep track of respondents and non-respondents. After the initial posting of the Web-based survey, two weeks were given for respondents to return the survey. A follow-up reminder was then sent to nonrespondents. A third and final reminder was sent one month later. Survey response date was utilized to assess reliability of the instrument, resulting in a Cronbach's alpha for the overall scale of .86.

Results

Of the 300 SAAS members surveyed, 62 agricultural scientists responded, for a response rate of 20.6%. There were substantially more male respondents (85%, n=53) than female (15%, n=9). The demographics indicated a great deal of career experience. Just over 53% (n=33) of respondents were 46 years old or older. Nearly 34% (n=21) of respondents had been employed in a university setting for more than 20 years, while another 40% (n=24) had been employed in a university setting for 6 to 15 years.

Slightly more than half were at the associate professor (20%; n=12) or full professor (31%, n=19) levels. However, 28% (n=17) said their job title fell in the "other" category, with most stating their titles were "government scientist" and "Experiment Station director or

superintendent." Just over 88% (n=54) of respondents were employed at a university at the time of the survey.

Respondents represented a variety of disciplines, adding diverse perspectives to the results. The majority of respondents represented the disciplines of agricultural economics (22%, n=13), agronomy (19%, n=11), animal science (22%, n=13), and horticulture (20%, n=12). Other disciplines represented include agricultural education (n=1), biochemistry (n=1), plant pathology (n=3), rural sociology (n=1), and soil and water conservation (n=3).

Scientists' Perceptions of Public Understanding

The first objective was to gauge respondents' perceptions of public understanding of agricultural science and science in general. Perceptions were measured with a series of statements followed by a Likert scale in which respondents indicated their level of agreement (1=Strongly Agree and 5=Strongly Disagree). Overall, respondents strongly disagreed with the notion that "the public gets all of the information it needs through the news media to understand an agricultural discipline" (M=4.37, SD=.814) or "to understand science" (M=4.37, SD=.891).

When asked to gauge public understanding, respondents indicated disagreement with the idea that the public understands their particular agricultural discipline (M=4.21, SD=.859) or science in general (M=4.31, SD=.737). There were no significant differences in perceptions of public understanding based on gender or academic discipline. An independent-samples t-test showed a significant difference in perceptions of public understanding based on whether respondents had media relations training (Table 1). Respondents who had media relations training indicated less agreement (M=4.67, SD=.48) that "The public gets all of the information

it needs through the news media to understand an agriculture discipline" than did respondents who had no media relations training (M=4.20, SD=.91).

Table 1

T-test for significant differences based on media relations training

	Training		No Training		t Value	Pr
	Mean	SD	Mean	SD		
The public gets all of the information it needs through the news media to understand an agriculture discipline	4.67	.48	4.20	.91	-2.61	.011

*1=Strongly Agree and 5=Strongly Disagree

There was no significant difference between respondents based on media relations training when presented with the statement, "The public gets all of the information it needs through the news media to understand science."

Scientists' Role in Public Understanding

Respondents were questioned regarding their perceived role in increasing public understanding of agricultural science and science in general. Although respondents indicated agreement that it is their responsibility to help people understand their agricultural discipline (M=1.72, SD=.98), they indicated less responsibility for helping people understand science in general (M=2.05, SD=1.01).

Similarly, respondents were more willing to work with reporters and to receive media relations training if it helped people understand their agricultural discipline than if it helped people understand science in general (Table 2).

Table 2.

Respondent willingness to help people understand science

	M	SD
I would make myself more accessible to reporters if reporters' stories helped the public understand my agricultural discipline.	1.87	.96
I would receive training on how to work with the news media if I believed it would improve the public's understanding of my agriculture discipline.	1.87	.93
I would make myself more accessible to reporters if reporters' stories helped the public understand science.	2.23	1.04
I would receive training on how to interact with the news media if I believed it would improve the public's understanding of science.	2.13	.98

*1=Strongly Agree and 5=Strongly Disagree

Respondents agreed that they would receive media relations training if they believed it would benefit them personally (M=1.98, SD=.93) or their university (M=1.83, SD=.91). When working on a topic they perceive to be newsworthy, respondents indicated more strongly that they would contact their campus news organization (M=2.00, SD=1.10) than reporters in general (M=2.53, SD=1.19).

According to independent-samples t-tests, respondents who previously received media relations training were significantly more disposed to contact their campus news organization if they had a newsworthy story, but they were not significantly more disposed to contact a reporter directly (Table 3).

Table 3.

T-test for significant differences based on media relations training

	Training		No Training		t Value	Pr
	Mean	SD	Mean	SD		

I will contact my campus news organization if I believe a topic I am working on is newsworthy.	1.62	.66	2.21	1.25	2.36	.022
I will contact reporters if I believe a topic I am working on is newsworthy.	2.33	1.06	2.63	1.27	.948	.348

*1=Strongly Agree and 5=Strongly Disagree

Scientists' Assessment of Colleagues' Perceptions of Public Understanding

While respondents agreed that it is their responsibility to help people understand their agricultural discipline (M=1.72, SD=.98), they were less convinced in their colleagues' conviction of this responsibility (M=2.75, SD=1.10). Respondents were also more convinced of their own responsibility to help people understand science in general (M=2.05, SD=1.01) than they were of their colleagues' perception of this responsibility (M=2.71, SD=1.13).

Respondents who previously received media relations training were significantly different, based on t-tests (Table 4), than those who had not in regards to their agreement with "My colleagues believe the public understands my agricultural discipline" and "My colleagues believe the public understands science." Respondents also differed significantly on their agreement that their colleagues believe it is their responsibility to help people understand their agricultural discipline and science in general.

Table 4.

T-test for significant differences based on media relations training

	Training		No Training		t Value	Pr
	Mean	SD	Mean	SD		
My colleagues believe the public understands my agricultural discipline.	4.57	.59	4.11	.77	-2.54	.014

My colleagues believe the public understands science.	4.52	.75	4.05	.84	-2.18	.034

Discussion and Implications

Respondents in this study indicated more willingness to contact their campus news organization than to contact reporters directly. Those with media relations training were more likely than those without to contact their campus news organization, but they were not more likely to contact reporters directly. More research should be done to determine if there is a need for scientists to have the skills to contact reporters or media organizations directly. If the need is revealed, it may be important to focus more on these communication skills in media relations training.

Those respondents with media relations training replied differently in response to questions about their colleagues' perceptions of public understanding of agricultural science. An obvious outcome of media relations training is a more realistic view of one's own abilities to work with the media. However, an additional outcome is a more critical view of one's colleagues' abilities to work with the media. Agricultural scientists who participate in media relations training may be convinced of the need for colleagues to receive similar training. They may actually serve as persuaders or opinion leaders in getting colleagues to receive such training.

This research presents several implications for communication practitioners. The responding scientists indicated more willingness to help the public understand their specific agricultural discipline than they did to help the public understand science in general. This may indicate that discipline-specific media relations training would be more salient to scientists. Agronomists may want to communicate different information through the media than animal scientists. As such, according to discipline, different aspects of media relations may be

highlighted in training. Forums where scientists are gathered by discipline, like the Southern Association of Agricultural Scientists (SAAS) conference, may provide an ideal setting for such training.

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Perceptions of Job Satisfaction and Gender Roles Among Select Florida Agricultural Communication Practitioners

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Abstract

Agricultural communication, at one time exclusively a male domain, is a field that has increasingly come to be dominated by female practitioners. Little is known, however, about how these changing demographics have affected perceptions of job satisfaction and gender relations of those working within the field. To addresses these issues, a mailed survey designed to assess job satisfaction and gender perceptions was sent to Florida members (n=24) of the Association for Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences (ACE). Results of this study indicated that Florida members of ACE seem to have moderate to high levels of job satisfaction. They are most satisfied with their present job, agricultural communication as an occupation, their knowledge of agricultural communication and related skills, the freedom and autonomy they have in their current job, and the recognition they receive from current supervisors. Members were less satisfied or dissatisfied with their income as an agricultural communication practitioner, the prestige of working in agricultural communication, opportunities for advancement, and the prospects for their future in agricultural communication. With respect to gender relations, respondents' perceptions of gender roles and relations in agricultural communication showed that while Florida ACE members may perceive some areas of gender inequity, they believe any problems occur more throughout agricultural communication than within their own organization.

Keywords: agricultural communication, gender, job satisfaction

Introduction

Agricultural communication, at one time exclusively a male domain, is a field that has increasingly come to be dominated by female practitioners. Similar to the trend within other media and communications industries, an increasing number of women have moved into the field (Scherler, 2001). Little is known, however, about how these changing demographics have affected perceptions of job satisfaction and gender roles of those working within agricultural communication. Although past studies or discussions have touched on some aspects of this issue, such as the number of women in undergraduate programs, the number of women in the field, or how women moving into the field might be perceived by farmers, there has been no single study on perceptions of gender roles within agricultural communication (Jeffers, 1987; Sprecker & Rudd, 1998; Scherler, 2001; Women at Work, 1976).

Interviews with female agricultural communicators, both past and present, show an awareness of the perceived differences between men and women within the field. JoAnn Bell Pierce was one of the first female agriculture writers/editors in the U.S. and has described her first job with *Farm Quarterly* as being an inexpensive investment for the magazine because they could pay her 50% less than another new male employee (Pierce, 1998). In 1973, Colleen Callahan Burns became the first full-time woman farm broadcaster, but only after answering questions like "'O.K., let's say we hire you. What are all these farm men going to think of a woman giving the farm price quotations and talking about production ag—which is traditionally a man's job?'" (Women at Work, 1976). More recently Mila Shah, the American Agricultural Editors' Association 2001 intern, stated; "I think it is very hard for women starting out because there still is a 'good old boys' network" (Sapp, 2002).

Purpose/Objectives

The purpose of this study was to describe perceptions of gender bias and job satisfaction of those currently working in the agricultural communication field, specifically focusing on members of the Association for Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences (ACE). Like many other fields, agricultural communication has professional organizations in which its members participate. ACE is the oldest and perhaps largest organization of agricultural communicators, with an approximate 700 members across the United States and the world (Carnahan, 2000; Hilt, 1988).

Members of ACE range in job descriptions from writers and photographers to graphic designers and electronic media producers, as well as marketing, public relations, editors and Web designers representing most, if not all, of the types of jobs within the agricultural communication field (ACE, 2004, Carnahan, 2000; Hilt, 1988). Members work in both the private sector in companies and firms, as well as the public sector within universities, government agencies, and research organizations (ACE, 2004, Carnahan, 2000; Hilt, 1988).

The objectives of this study were to:

1) Describe the perceptions of job satisfaction among a population comprised of ACE members in the Florida chapter; 2) describe the perceptions of Florida chapter ACE members with respect to gender roles both in individual organizations and throughout the agricultural communication industry; and 3) describe Florida chapter ACE members' perceptions related to their personal experiences of gender issues within agricultural communication

Theoretical Framework

As in many other communications fields, the field of agricultural communication is experiencing a demographic shift towards females representing the majority of practitioners. Researchers have suggested that whenever an occupation becomes "female," meaning a higher number of female workers than male workers, the value of the work decreases (Grunig, Toth, & Hon, 2001; Grunig, 1992; Toth & Cline, 1989; Creedon, 1989; Marlane, 1999). Traditional female occupations in which this trend has been documented include nursing, teaching, and clerical work (Kimmel, 2004; Grunig, Toth, & Hon, 2001). This devaluing process can be seen in many ways, but media researchers focus on the gender-based inequalities that a shift in female numbers brings about. These include, but are not limited to, unequal pay/salary, unequal opportunity for advancement, unequal distribution in areas of work, and perceptions of worker relations and the work itself (Grunig, 1992; Toth & Cline, 1989; Grunig, Toth, & Hon, 2001; Creedon, 1989; Gallagher, 1981).

Pay/Salary

Salary differences exist between men and women in many parts of the media, including journalism/news, broadcast (including television and radio), and public relations (Stone, 2000; Creedon, 1989; American Society of Newspaper Editors, 1999; Weaver, Beam, Brownlee, Voakes, & Wilhoit, 2003; Marlane, 1999; Toth & Cline, 1989, Grunig, 1992, Grunig, Toth, & Hon, 2001; US Census Bureau, 2004). A look at earnings data from the 2000 United States Census shows differences ranging from $8,000 to $20,000 between male and female salaries within media occupational categories (US Census Bureau, 2004). (See Table 1.)

Table 1
Average Earnings of Male and Female Media Workers

Occupation	Salary		Difference
	Male	Female	
News analysts, reporters and correspondents	$55,000 n=34,530	$44,000 n=25,340	$11,000
Public relations specialists	$65,000 n=39,290	$46,000 n=56,410	$19,000
Editors	$53,000 n=59,560	$42,000 n=61,320	$11,000
Technical Writers	$55,000 n=25,150	$47,000 n=26,560	$8,000
Broadcast/sound engineering techs & radio operators	$46,000 n=49,700	$36,000 n=6,860	$10,000
Photographers	$43,000 n=45,920	$29,000 n=17,400	$14,000
Television & video camera operators & editors	$51,000 n=12,740	$41,000 n=2,200	$10,000
Miscellaneous media & communication workers	$45,000 n=10,070	$35,000 n=14,020	$10,000

Note: based on number of year-round full-time workers (n) according to the 2000 US Census

It has been argued that any differences between the salaries of men and women in media jobs are due to factors such as level of education, years of experience, age, or work-related training, instead of gender. However, many media studies have shown this to be false, finding differences in male/female salary levels still exist when these variables are held constant (Grunig, 1992; Grunig, Toth, & Hon, 2001; Toth & Cline, 1989; Creedon, 1989; Weaver et. al.,

2003). Although this was most likely not done for the 2000 Census data, the size of the sample suggests that these differences between male and female salaries do exist.

Position/Advancement

Another trend seen within media research is unequal opportunity or unequal advancement for men and women. Many studies have shown that men and women do different types of work within the individual media industries. Although described in different ways, such as vertical job segregation or public relations roles, the reality is that women tend to be clustered around the lower level of jobs in an industry while men are more likely to hold high-level decision making positions (Grunig, Toth, & Hon, 2001; Grunig, 1992; Creedon, 1989; Communication Research Associates, Inc., 2002, Fall, Winter, 2004; American Society of Newspaper Editors, 2004; Arnold & Hendrickson, 2003; Marlane, 1999; Jamieson, 2001). There is a connection from this division of jobs between men and women back to the pay gap discussed earlier. Those who argue against the existence of a gendered pay gap claim that men make more than women because they are in the higher levels of the organization (Grunig, Toth, & Hon, 2001), but these arguments do not take into account the limited movement women have within the media industries.

Public relations studies have found that women face unique problems within their industry, including a double standard for men and women, unequal advancement opportunity, and discrimination on the basis of sex or gender (Toth & Cline, 1989). Using focus groups of men and women in 1990 and 1995, Grunig, Toth and Hon (2001) found that women feel men get promoted more quickly than women do, and that respondents considered it harder for women to reach the top of an organization than for men. A 2002 *PR Week* survey demonstrated the division of men and women into higher and lower job roles within public relations. While 8%

of the men surveyed were chairmen, presidents or CEOs of their companies, only 3% of the women were (Echo Research Inc., 2002). At the senior vice president level, 7% of the male respondents held the position, while only 2% of the women did. This trend is reversed on the lower position/role of account executive where 27% of the women surveyed work versus 18% of the men (Echo Research Inc., 2002).

Studies in broadcast media, both radio and television, have shown the same scarcity of women in high-ranking positions (Jamieson, 2001; Communication Research Associates, Inc., 2004; Marlane, 1999; Creedon, 1989). While women hold 26.5% of the news director positions in local television news, according to the 2003 Radio and Television News Directors Association Survey, this is only up from the 14% in 1987 (Creedon, 1989). In addition, women only hold 13.9% of general manager positions at television stations (Papper, 2003). Patterns are similar in radio with only 14.4% of news director positions for local radio news being held by women and only 7% of the general manager positions (Papper, 2003). Jamieson (2001) found women hold larger numbers in positions such as anchors (52% local and 44% national) and promotions managers (46% television and 43% radio).

Newspaper studies highlight the gendered division of labor, as well. According to the 2004 American Society of Newspaper Editors survey, 49% of women hold jobs as reporters in newsrooms while women are only among 18% of those who hold titles of president, publisher, or CEO in newspapers (Arnold & Hendrickson, 2003). In addition, only 16% of executive vice presidents and general managers are women (Arnold & Hendrickson, 2003). Women do comprise 63% and 73% of personnel senior vice president/vice president or director of human resource positions and senior vice president/vice president or director of community affairs respectively in newspapers or newspaper groups (Arnold & Hendrickson, 2003). These again

are the positions that are considered female and outside of the "line of succession" (Arnold & Hendrickson, 2003, p. 53).

The reasons for this restriction of women to the lower job categories are rooted in sociological methods and theories that focus on the concept of "gender bias." Gender bias is defined as "unequal treatment in employment opportunity (such as promotion, pay, benefits and privileges), and expectations due to attitudes on the sex of an employee or a group of employees" (Hill & Hill, 2003). Many researchers have cited the "good old boys" network described by American Agricultural Editors' Association intern Mila Shah (Sapp, 2002). According to Grunig, Toth and Hon (2001), "Almost all of our interviewees and focus group participants talked about women's isolation from the inner circle where important business gets done" (p. 293). Female public relations practitioners also stated that this network "shuts them out at the management table as well as on the basketball court or on the golf course" (Grunig, Toth, & Hon, 2001, p. 293-294). Arnold and Hendrickson also found evidence of this male network in their 2003 survey of newspapers and newspaper groups. Jamieson described the media companies in her 2001 study as "innovating in technology, ways of sending and receiving information, and economic models for the 21st century—but their executive suites and boardrooms still largely resemble the stereotyped practices of the 1950s" (p. 13).

Job Satisfaction

One way to look at an individual in the workplace is through job satisfaction. This provides a method to determine how a person feels about his or her job, and if factors such as those previously listed have any impact on those feelings. Although variously defined, job satisfaction is simply "the degree to which people like their jobs" (Scherler, 2001, p. 11). A large number of studies have been completed on job satisfaction within the media with varying

results (Serini, Toth, Wright, & Emig, 1997). While some studies have shown that gender is related to the job satisfaction of media workers (Grunig, Toth, & Hon, 2001, Barrett, 1984; Communication Research Associates, Inc., 2002, Fall, Winter), others have shown that no such relation exists (Serini et. al., 1997; Stone, 2000). One consistent finding is that both men and women are satisfied with their jobs as a whole (Serini et. al, 1997; Grunig, Toth, & Hon, 2001; Selnow & Wilson, 1985; Stone, 2000). The difference lies, then, in certain facets or variables related to a job. "The result of the inquiry into job satisfaction, although frequently contradictory, leads to an overall understanding that there are indeed differences between men's and women's levels of satisfaction with a variety of variables related to the work environment" (Serini et. al., 1997, p. 101). These variables include the work itself; job level, job security and promotions; pay; supervision and coworkers; and amount of work (Selnow & Wilson, 1985; Serini et. al, 1997; Grunig, Toth, & Hon, 2001; Barrett, 1984). Bowling Green State University's job satisfaction scales are "the most frequently used measure of job satisfaction" (Balzer, Kihm, Smith, Irwin, Bachiochi, Robie, Sinar, & Parra; 1997; p. 8). The Job In General (JIG) scale looks at overall job satisfaction, while the Job Descriptive Index (JDI) looks at five facets of job satisfaction (Balzer et. al, 1997).

Selnow and Wilson (1985) found in their study *Sex Roles and Job Satisfaction in Public Relations* that women were less favorable on their salary satisfaction scores than men. Similar results on salary satisfaction differences between men and women in public relations are presented in studies by Grunig, Toth, and Hon (2001) and Serini et. al. (1997). Another facet of job satisfaction that women are less satisfied with is the amount of work. In a 1990 study, public relations practitioners were questioned if they were asked within their job to do excessive amounts of work. Female respondents agreed that the work they were asked to do was

excessive, while the males did not (Bissland & Rentner, 1990). Women have been found to be less satisfied with their jobs when their supervisor is male, citing exclusion and isolation (Serini et. al., 1997).

Job satisfaction in broadcast media is similar between men and women, according to Stone (2000). Slightly more men are satisfied or very satisfied with their jobs in television than women, 79% vs. 74%. In radio, more women than men are satisfied or very satisfied with their jobs, 78% vs. 72%. However the facets mentioned above such as salary and position were found to have the most influence on job satisfaction of both genders. In addition, 54% of women in television said their current salaries are less than they expected when they entered the field while 67% of women in radio said the same (Stone, 2000).

Women in news/journalism are also less satisfied with these facets of their jobs (Communication Research Associates, Inc., 2002, Fall, Winter). A 2002 study showed that women reported lower job satisfaction with salary and relationships with their bosses, as well as lower satisfaction with salary levels when they held low ranking positions within the newsroom (Communication Research Associates, Inc., 2002, Fall, Winter). In addition, women are four times more likely than men to predict they will leave the newspaper industry to work in another field (Communication Research Associates, Inc., 2002, Fall, Winter). The 2002 American Journalist Survey showed that only 71.7% of female journalists were “fairly” or “very” satisfied with their jobs, while 86.6% of male journalists were (Weaver et. al., 2003). Barrett (1984) studied job satisfaction among newspaperwomen and found high overall job satisfaction levels. However, low job satisfaction was expressed by the women in regards to opportunity to advance and salary.

The literature suggests that the feminization of any field, including agricultural communication, can produce inequalities as demonstrated in public relations, news, radio and television. Although a great number of women work in these fields, men are often in charge. This imbalance can affect pay levels, job satisfaction levels, status of the industry positions, what gets covered and produced by the media organizations, and more.

Methods/Procedure

This study used a descriptive survey distributed to all Florida chapter ACE members (N=24) by traditional mail. The 160-item questionnaire included 18 items based on the Bowling Green Job in General Scale (JIG) and 26 items from the job satisfaction studies of members of the Public Relations Society of America from 1990 and 1995 (Serini et. al., 1997, p. 101) as well as a series of demographic items, and open-ended questions. For the purposes of this study, the job satisfaction and open-ended response items were analyzed. Reliability for the Job in General Scale has been established, with a reported Cronbach's alpha of r = .92 (Balzer et. al, 1997). Reliability for the PRSA survey instrument subscale indices has been reported as follows: for the gender perception scale (relating to inside one's organization), r = .73 and r= .56 (with respect to the industry as a whole) (Grunig, Toth, & Hon, 2001); for the flextime scale, r=.72 and r= .75, respectively; and for the job satisfaction scale, r = .85.

To conduct the present study, Dillman's Tailored Design (2000) survey procedures were utilized. The instrument was reviewed by a panel of experts for content and face validity. The first wave included a cover letter, an informed consent statement for the participants to sign and return, the instrument and an answer sheet, and a postage-paid, self-addressed return envelope and was sent on August 26, 2004. Each mailed questionnaire and answer sheet was coded to identify non-respondents. A second wave via email was sent on September 2, 2004, to remind

participants of the survey due date and to thank them for their participation. A third wave containing the original survey packet was sent to nonrespondents on September 16, 2004.

Data collected from this survey was analyzed using Statistical Software for Social Sciences (SPSS). Both descriptive and correlational statistics were analyzed.

Results/Findings

Thirteen Florida ACE members responded to this survey, for an overall response rate of 54.2%. All respondents stated they work for a land-grant university--the University of Florida. Gender breakdown for the thirteen respondents was seven male (53.8%) and six female (46.2%).

Objective one was to describe the perceptions of job satisfaction among Florida ACE members. Overall job satisfaction was measured by averaging the participants' responses to 18 items on the JIG on a weighted scale where 1=yes, 2=no and 3=cannot decide. The resulting grand mean for job satisfaction was M=26.53, where zero is the lowest possible score and 54 is the highest. According to Balzer et. al (1997) scores well above the midpoint of this scale (M=32 or above) indicate satisfaction while those well below the midpoint (M=22) indicate dissatisfaction. The mean for this study is slightly below the midpoint of M=27, which indicates a somewhat neutral response for overall job satisfaction.

The other set of job satisfaction items, consisting of 14 questions, came from the PRSA surveys mentioned above. Means of the respondents' answers indicated they were least satisfied with their income (M=3.25), the prestige of working in agricultural communication (M=3.67), prospects for their future in agricultural communication (M=3.92), and opportunities for advancement with their present employer (M=3.00). (See Table 2.) For these items, respondents were most satisfied with their knowledge of agricultural communication (M=4.33) and related

skills (M=4.42), the freedom and autonomy they have in their current jobs (M=4.75), and the recognition they receive from superiors (M=4.25).

Table 2
Perceptions of Job Satisfaction of Agricultural Communication Practitioners

How satisfied are you with…	*Mean*	*Standard Deviation*	*N*
Your present job in agricultural communication?	4.08	.90	12
Agricultural communication as an occupation?	4.25	.86	12
Your income as an agricultural communication practitioner?	3.25	1.14	12
The prestige of working in agricultural communication?	3.67	.65	12
Your knowledge of agricultural communication skills?	4.42	.51	12
Your overall knowledge of agricultural communication?	4.33	.49	12
Prospects for your future with your present employer?	4.08	1.24	12
The value of your job to society?	4.17	.83	12
The freedom and autonomy you have in your present job?	4.75	.45	12
Prospects for your future in agricultural communication?	3.92	1.08	12
Opportunities for advancement with your present employer?	3.00	1.04	12
Job security in your present position?	4.08	.99	12
Recognition you get from superiors?	4.25	.75	12
How your family and/or friends feel about you working in agricultural communication?	3.67	.89	12

Note: based on a Likert scale with 1=extremely dissatisfied and 5=extremely satisfied.

Objective two was to describe the perceptions of Florida ACE members with respect to gender roles both in individual organizations and throughout the agricultural communication field. Twelve questions adapted from the PRSA survey asked for respondents' opinions on gender and gender-related situations, such as pay and promotion, both within their organization and throughout agricultural communication as a field. (See Table 3.) Respondents expressed

strongest agreement that women are more likely than men to be hired for staff positions involving mainly communications skills throughout agricultural communication (M=3.5), there is less sexual harassment today than there was five years ago in their organization (M=3.42); as well as throughout agricultural communication (M=3.42), and there are more women than men in agricultural communication (M=3.33). The strongest levels of disagreement from respondents were that women are more likely than men to be hired for management positions involving problem-solving and decision-making in my organization (M=2.5), and if an equally capable women and man applied for the same job, the woman would be hired in my organization (M=2.42); as well as throughout agricultural communication (M=2.58).

Table 3
Perceptions of Gender Relations and Roles in Agricultural Communication

Statement	In your organization		Throughout Agricultural Communication		*N*
	Mean	Standard Deviation	Mean	Standard Deviation	
Generally women receive lower salaries than men for doing comparable work	2.58	.99	3.25	.62	12
Women are more likely than men to be hired for staff positions involving mainly communication skills (writing, editing, graphics, etc.)	3.17	1.11	3.50	1.00	12
Women are more likely than men to be hired for management positions involving problem-solving and decision-making	2.50	.67	2.67	.49	12
Men are promoted more quickly than women in most employment situations	2.92	.90	3.25	.75	12
Men are more apt than women to back down or seek compromises in office conflict situations	2.83	.72	2.92	.67	12
If an equally capable woman and man applied for the same job, the woman would be hired	2.42	.90	2.58	.90	12
Women often are hired as a result of affirmative action policies	2.67	.78	2.75	.96	12
There is less sexual harassment today than there was five years ago	3.42	.67	3.42	.67	12

It is more difficult for women than it is for men to reach the top	3.25	.96	3.25	.96	12
Women in management positions are paid less than men in comparable jobs	2.92	.67	3.00	.60	12
There are more women than men in agricultural communication	3.25	1.01	3.33	.95	12
Members of my audience prefer to work with males	2.75	1.05	2.83	1.19	12

Note: based on a Likert scale with 1=strongly disagree and 5=strongly agree.

Objective three was to describe Florida ACE members perceptions related to their personal experiences of gender inequality within agricultural communication. Seven of the thirteen participants gave responses to the following open-ended questions.

> Have you ever experienced any situations within your work in agricultural communication in which you felt your gender was a factor in the last five years? If so, please describe this situation.
>
> Have you experienced any form of inequality due to gender or sexual harassment within your work in agricultural communication in the last five years? If so, please describe the situation.
>
> Do you feel gender is a factor within agricultural communication? Please elaborate.

In response to the first two questions, one participant stated that there is a "certain amount of favoritism with male leadership" and that they "have noted several harassment situations that have been dealt with as a supervisor" in the last five years. All but two of the respondents agreed that gender is a factor within agricultural communication, but gave varying reasons for this. One respondent wrote that gender is "not as great a factor as it has been in past years, but still not where we should be" while another said "Of course it is. As in any field, gender is a factor in our day-to-day interactions as human beings. However, I believe the situation has improved in recent decades. I think U.F. is more progressive in this area, compared to other Southern universities." A third respondent cited the number of women in the field, saying gender is an issue "only that there are more women in ag comm than men, but this is

commonplace in communications, in general (in my opinion) to have more women than men." Similar to this, another respondent replied that "demographic and cultural trends have affected and are affecting the profession. Not too much overt discrimination, but probably inadvertent discrimination for sure." The final participant who stated gender is an issue within the field stated, "With more than 30 years of service in agricultural communication, I have seen a dramatic change in attitudes about women in this field. In some of the more traditional, conservative agricultural communication programs, women and minority men have experienced discrimination."

Of the participants who did not consider gender to be an issue within agricultural communication, one stated "people are hired, promoted and given raises based on importance of work, competency and success." The second person said, "I find our clientele does not differentiate based on gender--a healthy sign."

Discussion/Conclusion

Results of this study indicate that Florida members of ACE seem to have moderate to high levels of job satisfaction. They are most satisfied with their present job, agricultural communication as an occupation, their knowledge of agricultural communication and related skills, the freedom and autonomy they have in their current job, and the recognition they receive from current supervisors. The results also showed Florida ACE members are less or dissatisfied with their income as an agricultural communication practitioner, the prestige of working in agricultural communication, opportunities for advancement, and the prospects for their future in agricultural communication. This dissatisfaction could result in people leaving their current positions or even leaving agricultural communication completely. Results from the JIG index

are not conclusive; limitations of this study include the small size of the population and the fact that it is not possible to generalize these results to other ACE chapters.

Respondents' perceptions of gender roles and relations in agricultural communication showed that while Florida ACE members may perceive some areas of gender inequity, they believe any problems occur more throughout agricultural communication than within their own organization. This too was addressed by the literature review discussion of the 1990 and 1995 PRSA studies where the authors also found this trend.

In the present study, Florida ACE members agreed most strongly with the statement "Women are more likely than men to be hired for staff positions involving mainly communications skills." Looking at the media industries previously reviewed, the categorization of women into lower roles within any organization is commonplace. While men are more likely to be producers, supervisors, and chairmen, women in communications are usually writers, editors, and other roles with little supervisory control. This is also seen in respondents' disagreement with the statement "Women are more likely than men to be hired for management positions involving problem solving and decision-making." In addition, Florida ACE members tended to disagree that "If an equally capable women and man applied for the same job, the woman would be hired."

Of those participants who did respond to the qualitative portion of the survey, all but two of the seven stated that gender is a factor within agricultural communication. Many different reasons and explanations were given, but the fact that so many people agreed gender is an issue is important to note and discuss. Just as job satisfaction can have an effect on an agricultural communication practitioners' desire to leave a job or the industry, so too can gender relations within an organization and its related field. This is an important trend for managers and leaders

within agricultural communication to see and understand. In addition, many mass communication theories state that those who produce communication messages and images can influence not only the content but also the reception and then perception of these messages (Gallagher, 1981; Bandura, 2001; Entman & Rojecki, 2001; Fiske, 1995; Dines & Humez, 2003). When communication industry practitioners of any type perceive gender issues and inequities, this could result in messages and images that reinforce that imbalance in audience members (Gallagher, 1981; Bandura, 2001; Entman & Rojecki, 2001; Fiske, 1995; Dines & Humez, 2003).

Future research recommendations include addressing limitations of this pilot study to achieve better and more complete results. Currently, a nationwide survey of all ACE members nationwide is underway, in an attempt to develop a more accurate understanding of how job satisfaction and gender are perceived by this group of agricultural communication practitioners. Exploring the issues of job satisfaction and gender relations within the field of agricultural communication will assist its leadership in developing ways to insure its health and growth for a long time to come.

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Distance Education in the Agricultural Communications Realm: A Synthesis of Research

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Abstract

Distance education over the past decade has made great strides to reach place bound students via new communications technologies such as the Web and teleconferencing. The purpose of this study was to synthesize the research related to distance education done in the last 10 years by agricultural communications researchers. The *Journal of Applied Communications, Proceedings from the Southern Association of Agricultural Scientists Agricultural Communications Section*, and *Proceedings from the Association of Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences (ACE)* research session were utilized to provide a synthesis of current research in this area. Upon review, relevant research was synthesized into six major areas: faculty training, students, instructional design and technology, course implementation, department head and university perceptions, and evaluation. Findings from these studies indicate that technology skills training is needed for both faculty and students, while instructional designers, who were trained as communicators, are looking for training in asynchronous learning and instructional design practices. In addition, studies show that department heads are supportive of faculty developing and teaching distance courses and of opportunities for educators to collaborate with business to reach adult learners.

Keywords: Distance education, research synthesis, distance learning

Introduction

Over the past decade colleges and universities across the United States have made great strides to reach students via new and innovative delivery methods without requiring students to be on campus. According to the National Center for Education Statistics (NCES, 2004) during the 2000-2001 academic year, 56 % of all two-year and four-year institutions offered some form of distance education in order to reach a variety of students. An estimated 2,876,000 students were enrolled in 127,400 different college-level distance education courses during 2000-2001 (NCES, 2004).

Many of these students are enrolled in colleges of agriculture, and are currently being taught by faculty who employ Web-based tools and other communication technologies in ways never before thought possible. These new advancements allow for richer course material and access to experts than may be inaccessible otherwise. Bowen and Thompson (1995) concluded that agricultural communicators and colleges of agricultural sciences should examine these opportunities that technology is creating in the educational realm. In order to fully observe these opportunities, however, researchers must take inventory of the scholarly work that has been done thus far.

In 2002 Williams and Woods examined research previously published in the *Journal of Applied Communications* and called upon agricultural communicators to conduct further research in the specific areas of the special interest groups (SIGs) that are sponsored by the Association of Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences (ACE), in order to answer the challenges confronting the agricultural industry. In their study, Williams and Woods (2002) found that from 1992-2001, distance education was the sixth most researched area in the

Journal of Applied Communications. In order to advance research in this area by agricultural communicators, it is important to note what research has been done and where opportunities for further research may lie.

Distance education is comprised of many communication technologies with which agricultural communicators are familiar (Telg, 1995). The purpose of this study, therefore, was to draw a conceptual map of where agricultural communicators are in terms of distance education research, and to delineate where the future may lead us. Research syntheses are an effective research method to review and critically examine the current knowledge base in the field in an attempt to bring focus on future research opportunities (Williams & Woods, 2002).

Objectives

The main objective for this analysis was to synthesize the research related to distance education done in the last 10 years by agricultural communications researchers. A second objective of this study was to identify those areas of opportunities that might suggest directions for future research by agricultural communicators in distance education.

Procedures

Three sources were utilized to gather data for this study: 1) *Journal of Applied Communications*; 2) *Proceedings from the Southern Association of Agricultural Scientists Agricultural Communications Section*; and 3) *Proceedings from the Association of Communication Excellence in Agriculture, Natural Resources, and Life*

and Human Sciences research session. These sources were chosen since they specifically place emphasis on communications research. The *Journal of Applied Communications* has been perceived as the premier peer-reviewed journal in the field for many years. (Williams & Woods, 2002). All three sources are utilized not only by researchers, but also by agricultural communications professionals, such as those involved in distance education, who use research findings to help them in their everyday work. Studies presented in these refereed publications were located through the Southern Association of Agricultural Sciences (SAAS) Website, as well as the Agricultural Documentation Center. For the purpose of this study, only articles published from 1995-2003 that pertained to distance education or distance learning were selected. A beginning year of 1995 was chosen since this was the first year distance education was discussed in the *Journal of Applied Communications.*

Upon closer examination of the articles, six main themes emerged from the research that was reviewed: faculty training, students' comfort level with technology and perceptions thereof, instructional design and technology, course implementation, department head and university perceptions, and evaluation. Articles were then grouped by these themes to analyze the complete range of research being done by agricultural communicators represented in these publications.

Findings

A total of 24 articles were published that dealt with distance education. Of those, 11 articles appeared in the *Journal of Applied Communications*, eight appeared in the Proceedings of the Agricultural Communications Section of the Southern Association of

Agriculture Scientists, and five appeared in the proceedings of the ACE research SIG's annual research paper presentation sessions. Of the 24 articles synthesized, four dealt with faculty, eight dealt with students, five dealt with instructional design and technology, four dealt with course implementation, two dealt with department head and university perceptions, and one looked at evaluation (see Table 1).

Table 1
Group Topics Published in the Journal of Applied Communication (JAC), SAAS Research Proceedings, and ACE Research Proceedings 1995-2004

Group Topic	JAC	SASS	ACE	**Total**
Faculty	2	1	1	4
Students	4	2	2	8
Instructional Design/Technology	2	3	-	5
Course Implementation	1	1	2	4
Department Head/University Leadership Perceptions	1	1	-	2
Evaluation	1	-	-	1
Totals	**11**	**8**	**5**	**24**

Faculty Training

Several articles showed that instructors involved in distance education indicate a need for training (Irani & Telg, 2001a). Irani and Telg (2001b) found that most universities' education coordinators or training centers did not offer training for faculty across campus, but most individual colleges conducted training programs of their own. Miller and Carr (1997) found that agricultural faculty members have shown interest in training on teaching techniques, models of effective teaching, and designing instruction for their distance education courses over development and technical components. Irani and Telg (2001a) added that training content should cover instructional design and technology.

Studies report that training should exist in a formal format and be self-paced in order to better accommodate faculty needs (Irani & Telg, 2001a). These training

materials should be in a constant state of evolution due to the ever-changing world of technology (Irani & Telg, 2002c). Irani and Telg (2002c) called for a collaborative, cross-institutional effort to achieve quality and innovative training for distance education.

Irani and Telg (2001b) proposed a "distance education faculty training development model" that stressed institutional support as a foundation followed by two pillars of content and training surrounding program effectiveness. The top level of their model represented faculty motivation, which they described as dependent on the level and quality of the other four factors.

Students

While students appreciate the emergence of distance education, research shows that skill development training sessions would help them to better perform in the virtual classroom. Irani and Telg (2002a, 2002b) found that students in a college of agriculture are comfortable with various technologies in the classroom, but prefer the interactive nature of videoconferencing to other methods. Students who enroll in one or more courses via distance delivery methods indicated feeling less comfortable with the technologies than those who were enrolled for the first time, indicating that first time students may have been unaware of all that is involved in distance education course delivery (Irani & Telg, 2002a, 2002b).

Kelsey (2000) advised that skill training should be provided for all students involved in distance education at the beginning of distance-delivered courses. When students were aware of the technology, anxiety was reduced (Kelsey, 2000). In contrast, for students with communication apprehension, findings showed that no amount of training would increase their level of interaction in the course setting (Kelsey, 2000).

Whereas most students are not interested in taking a self-assessment of their skills before taking a course through distance education, they did indicate they would engage in technology training if such an assessment indicated a need (Irani & Telg, 2002a, 2002b).

Irani, Harrington, Telg, and Scherler (2000) suggested that a personality inventory assessment, like the Myers-Briggs Type Indicator, teamed with a test of perceptual/attitudinal indices might help to indicate the likelihood of success in a distance learning environment. Irani et. al stated that personality, as well as perception and prior experiences, could be diagnostic in terms of a student who will have a successful experience in a distance learning environment.

Niti and Bowen (1998) concluded that, for a course to be effectively taught via distance, it is important to understand the needs of learners. They found that a majority of agricultural science graduates were interested in taking courses via distance learning, but that many were not familiar with the technology. Due to this finding, Niti and Bowen noted that it is imperative that faculty and support personnel to prepare students for the distance education experience *a priori*.

Linder and Murphy (2001) found, in a study of student perceptions of WebCT, that the software used contributed to student's abilities to accomplish course objectives. However, many students did not take advantage of the student-centered on-line learning environments, making it necessary for instructors to encourage students to interact on-line through learning activities. Linder and Murphy also discovered that, while students enjoyed their WebCT experiences, they continued to rely on print-based course materials. Murphy and Linder (2001) reported similar findings and added that the WebCT function for tracking grades and progress was used by students more than any other function.

Knecht (1996) described three characteristics of a successful Web-based program for adult learners, citing the importance of programs designed to meet the learners' needs, programs engaging the learner with experiential opportunities, and programs offering rapid feedback to adult learners.

Instructional Design/Technology

The technology and instructional design components for most distance education courses are the forefront for instructors and staffers serving as technology experts. Murphy, Dooley, Wickersham, and Parlin (1999) chronicled the perspectives of producers, instructors, and students engaged in a streaming media lesson. They concluded that for this type of delivery it was imperative to decide on an appropriate content matter, and that planning the script and visuals added to success. Students involved in the study reported enjoying the flexibility of the streaming media lesson, but missed the interaction typically present in on-campus courses.

Bielema (1997) stated that it is advisable to look for instructional design strategies to work with non-traditional distance learners in agriculture sciences. The researcher noted that computer-mediated communication can increase interaction on several levels, and helps students to practice electronic skills. Bielema found the need of the moderator essential in helping electronic discussions, and reported that a variety of learning preferences could be accommodated through using multiple media formats in distance education courses.

In order to help instructors improve the efficiency and effectiveness of technology in their distance education course, Owen (2000) proposed a matrix to help in making the decision of what technology is right for each situation. The matrix calls for educators to

examine the content of the course and the characteristics of the learners as they develop learning activities, educators must then use the criteria of teaching methods, interactivity, richness, and learning accessibility to find the technology that is appropriate for the course in question.

Instructional designers and technology specialists play an important role in design and implementation of distance delivered courses. Many communicators involved in these aspects bring prior knowledge into their jobs (Telg, 1995). Telg examined television production specialists and how they utilized prior production experiences while working on distance education courses. The researcher concluded that these specialists use previous experiences of communication models and audience analysis to base their instructional design techniques. Findings showed that respondents had no instructional design training, which encouraged a need for theoretical knowledge to help accompany the practical knowledge already possessed by these experts. Raulerson, Telg, Moore, and Dooley (2003) answered this need with the introduction of their program, "Roadmap to Effective Instructional Design," to certify instructional designers and educational technologists who possess the technology experience, but may not understand the learning theories behind distance education. A needs assessment completed before implementation of the project to train distance education trainers showed that these professionals were interested in such a training program and felt they needed content in designing for asynchronous learning, engaging and designing content for adult learners, and best practices in distance education. The researchers reported that the project described will allow instructional designers to more effectively assist faculty who can then teach courses in a more prepared manner.

Course Implementation

Several researchers have shared their experiences with distance education, and offered conclusions from what they learned. Nehiley (1998a, 1998b) examined the use of distance learning with an agricultural writing course compared to an on-campus course taught by the same instructor. Nehiley found that on-campus students turned in work that was more complete and showed a better understanding of the material, while those students off-campus submitted papers that were not as organized or complete. Nehiley also noted difficulty for the instructor to control the timeliness of turning in assignments by distance students, as well as difficulty for the instructor in providing comments on papers submitted and returned electronically.

Lundy, Irani, Turner, Percival, and McPherson (2003) gave insight into how an agricultural science program partnered with business to provide distance learning for employees. Researchers found the need for future evaluation of the program to measure students' feelings after the program, but found that the program showed great promise for partnerships between business and education through distance education. Lundy, et al. also noted a need for teaching assistants who help instructors with distance courses to receive further technical training in order to better help students.

Riddick and Richardson (1997) analyzed the use of low-tech distance education methods to teach farmers organic farming practices. By combining printed materials with explanatory audio cassettes, Riddick and Richardson concluded learners were able to gain valuable information at their own pace and expressed appreciation to be able to review information as needed.

Department Head and University Perceptions

Research shows that heads of departments in colleges of agriculture are supportive of distance education. Bowen and Thompson (1995) assessed the perceptions of department heads in U.S. colleges of agricultural sciences regarding the delivery instruction using technologies. They found that many department heads were positive in their support for faculty involved in distance education, but saw a need for in-service education for faculty to enhance their abilities to effectively teach courses via distance.

Hayes (1997) reported that leadership of state higher education coordinating boards are aware of and interested in furthering the use of technology in the delivery of higher education. In most cases, Hayes described, the institutions have already made investments in telecommunication technology, in order to further improve systems.

Evaluation

Laughlin (1998) suggested that self-efficacy in perceived attainment of course objectives would be a useful model for those trying to assess student outcomes in distance education programs. Laughlin suggested that faculty must work together to agree on the specificity of objectives. Laughlin also suggested that this specificity would enhance the learner objectives and allow for more summative evaluations.

Conclusions

For distance education to be fully and effectively utilized, past research must be thoroughly reviewed and built upon. With this goal in mind, the following findings are noted and conclusions drawn. Research completed by agricultural communicators analyzing distance education has addressed many of the key components of distance education, including research related to faculty, students, and instructional design.

Findings show that students, faculty, and other communicators serving as instructional designers are all in need of more advanced training in their distance learning roles. Instructors have voiced a need for this training to be in a self-paced formal format. Department heads and university leadership continue to encourage and support faculty in their effort to deliver learning in this new technology rich format, and are aware of the need for training of these faculty members to be successful.

Students feel comfortable with technology. However, they would benefit by participating in skills training before a course begins. The research base shows that students enjoy taking courses via distance and are interested in interaction within their courses, but want the ability to have access to print material as well.

It has been suggested that self-efficacy in perceived attainment of course objectives would be a useful model for faculty when trying to assess student outcomes in courses delivered via distance.

Instructional design strategies must be at the forefront when courses are conceived. Many features and components can be added, such as digital video, chat rooms, and interactive tutorials. However, they need to be tailored to the students. Instructional designers and educational technologists designing these courses must continue to use their knowledge gained from their communication backgrounds, but are in need of training in educational theories and how to train faculty on these new educational tools.

Collaboration should exist among educational institutions and between institutions and business leaders in need of distance education programs for their staff. With the support of faculty and department heads, the opportunity for this educational

avenue to be pursued is broadening. Agricultural communicators and researchers can assist through their expert knowledge of technology, foundation in communication theory, and research capabilities.

Recommendations

This synthesis has identified several research deficiencies related to distance education in the agricultural communications research base. Future research should seek to answer the following questions in order to assist educators in preparing and implementing distance education courses in colleges of agriculture:

1. Do training programs adequately prepare faculty for course structure and technology-related problems?
2. What are the current collaborative faculty training programs among colleges of agriculture that are being used to answer the need for training?
3. Is the model set forth by Owen (2000) useful in assisting faculty and instructional designers involved in distance education to effectively choose the right type of technology for the specific teaching situation?
4. What are the actual components in a course that help students to learn?
5. Do components of visual communication have any measurable effect on distance learning in the electronic environment?
6. Does student training facilitate a more interactive and complete usage of courses developed in programs like WebCT?
7. What are the leading evaluation models of distance education that have been successfully employed in courses in colleges of agriculture?

While this list does not offer all possible research questions, it is believed that these are starting points to further develop the research base in distance education by agricultural communicators. As distance education continues to evolve, evaluation of

student, faculty, and instructional designers' needs should continue to be assessed. New educational tools will also require evaluation to determine how they assist in the educational process.

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Communication Preferences of Politically Active Agricultural Leaders

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Abstract

Agricultural associations and advocacy organizations have begun to use the Internet to establish more effective online grassroots help for lobbying efforts, yet little research has been conducted to ascertain communications technology preferences and willingness of members to use the Internet as a communications tool. To address this issue, a descriptive survey was mailed to a purposive sample (N=814) of members holding leadership positions in the Florida Farm Bureau. 268 members responded to the survey, for an overall response rate of 33%. Findings showed that respondents used communication technologies frequently, expressed competence in basic technology procedures, and actively communicated with elected officials at the local, state, and federal levels. Respondents indicated that they preferred to receive and send information through the mail, and that they were most inclined to take a strong role in communicating with officials when policies negatively impacting agriculture were being considered. Respondents felt that e-mail would be an adequate substitute for some forms of communication, but were less likely to say that e-mail would be a good substitute for more personal methods of communication, such as telephone conversations or face-to-face meetings. These findings suggest that where it is important to communicate en masse rapidly, the online method may have advantages. However, a "one-way-fits-all" online method of communicating with elected officials may not always be the most effective communication method; more personal ways of communicating, especially at the local and state levels, may still be best for some issues.

Keywords: grassroots campaigns, lobbying, communications technologies

Communication Preferences of Politically Active Agricultural Leaders

Background

Political activism has always been a part of the American political process. But in recent years, activists have begun using another weapon in their communication arsenal to shape public opinion: the Internet. Although activists still use traditional methods, such as demonstrations and door-to-door campaigns to share their ideology, the benefits of the Internet often outweigh the costs and time that these other methods carry. Electronic mail newsletters can be distributed cheaply and quickly to millions of subscribers. Putting up a Web site translates into anyone anywhere finding out about a particular political issue that is being supported or denounced by an activist organization. And even the content of a Web site can lead to political or legal activity. In 2003, the People for the Ethical Treatment of Animals sued KFC because of what PETA said are "deceptive statements on the KFC Web site" (CNN, 2003, http://money.cnn.com/2003/07/07news/companies/peta_kfc.ret/index.htm?cnn=yes). These methods can be used to get out information to a larger number of individuals and sway opinion, because people become affiliated with a group because they inherently support what the group does (Hinkle, Fox-Cardamone, Haseleu, Brown, & Irwin, 1996). In a study of environmental activism and the Internet, Kutner argued that many believe the Internet has enabled grassroots environmental organizations to be more effective at accessing and disseminating information to constituent groups, as well as empowered marginalized segments of society, yet little research has been conducted in this area (Kutner, 2000).

Beyond activists, the political process itself is becoming more focused on the integration of an Internet-savvy society. A multitude of complex bills are voted on each year (Paletz, 1999); as a result, legislators may receive hundreds, if not thousands, of e-mails from constituents when hotly contested bills are debated in Congress or policy decisions are made. For example when NASA announced plans in January 2004 to cancel further servicing missions to the Hubble Space Telescope, the agency was flooded with email. "It's been overwhelming, said Steve Beckwith, director of the Space Telescope Science Institute. "My e-mail is overflowing" (CNN, 2004, http://money.cnn.com/2003/07/07news/companies/peta_kfc.ret/index.htm?cnn=yes). Boone, Tucker, and McClaskey's (2002) study of U.S. congressional aides noted that aides "rely on a mix of new and traditional communication channels for receiving policy information" (p. 40), with the top three channels being personal contacts, electronic mail, and the Internet/Web. On-demand, anytime, anywhere information was important for the aides (Boone et al, 2002).

Because of the growing prevalence of "quick votes" – bills that come up on the floor of legislatures without much publicity or notice – in many governmental bodies, organizations interested in legislative matters are finding it necessary to communicate with their membership and return constituent responses to legislators quickly and efficiently (P. Cockrell, Florida Farm Bureau Federation executive director of Organization and Programs, personal communication, July 3, 2003). Many organizations, therefore, are looking to take advantage of the online communication process, to establish more effective online grassroots help for lobbying efforts. For example, Florida Citrus Mutual, a cooperative of citrus growers, established an e-mail alert for its members,

apprising them of legislative issues or controversial topics affecting the citrus industry (C. Pace, Florida Citrus Mutual public affairs manager, personal communication, August 11, 2003).

The Florida Farm Bureau Federation, with an estimated membership of more than 150,000, also is contemplating the online lobby environment (Cockrell, 2003). The American Farm Bureau, of which the Florida Farm Bureau is a part, "is an independent, non-governmental, voluntary organization governed by and representing farm and ranch families united for the purpose of analyzing their problems and formulating action to achieve educational improvement, economic opportunity and social advancement and, thereby, to promote the national well-being" (American Farm Bureau, 2004, http://www.fb.org/about/thisis/). The Florida Farm Bureau works to encourage the growth of the agricultural industry in the state, to protect working agricultural landscapes, and to help preserve the environment (Cockrell, 2003).

Previous studies indicate that national and Florida Farm Bureau members have increasingly adopted the Internet as a communications tool in recent years. The use of the Internet by the American Farm Bureau's Young Farmers and Ranchers, men and women ages 18 to 35, has increased from 10.5% of its members in 1996 to 79.7% in 2001 (American Farm Bureau, 2002). Also during that time, the Young Farmers and Ranchers' use of e-mail has jumped from 31.8% in 1998 to 79.7% in 2001. Baker and Wilson (1998) examined Florida Farm Bureau county directors' use of computer technology. The researchers found that 45% of county directors were online; 56% did not use the Internet, mainly because of a lack of knowledge of how to use the Internet; 40% of nonusers

planned to get Internet access within three years; and only 33% used the Internet outside of their homes.

One of the Florida Farm Bureau's functions is to engage legislators and policy makers about issues that impact agriculture throughout Florida. In order to enhance and update its grassroots-level lobbying efforts, the Florida Farm Bureau recently implemented a program called Farm Bureau's Agricultural Contact Team (FBACT). FBACT is set up to establish teams that have access to a restricted Web site that provides key information on upcoming votes and issues important to the Florida Farm Bureau. These members also can be sent "Action Alerts" via electronic mail, regarding upcoming votes. Farm Bureau members, then, can immediately respond to their legislators by e-mail.

For agricultural-related information, government and internal sources were most popular for congressional aides, followed by interpersonal networks of "agricultural and natural resource professionals, constituents, and agribusiness contacts" (Boone et al, 2002, p. 40), placing ahead of such traditional sources as agricultural media, land-grant universities, and mass media (Boone et al, 2002). Because the Florida Farm Bureau can be categorized in the second tier of information sources, as agricultural professions or agribusiness contacts, this study took on added importance to find out how engaged Farm Bureau members were in the political process.

Purpose of the Study

The purpose of this study, therefore, was to determine if Florida Farm Bureau leaders have the technological capability and motivation to take part in an online lobbying program. To accomplish this, the study had four objectives: 1) to identify

participants' communication preferences (mail, telephone, fax, electronic mail), 2) to assess the level of political activity among Florida Farm Bureau leaders, 3) to determine participants' level of communication technology use, and 4) to determine the ability and willingness of Florida Farm Bureau's leaders to use the Internet as a communications tool. For this study, a politically active person is defined as someone who actively contacts his or her local, state, or federal elected officials.

Theoretical Framework

The results presented in this study provided Florida Farm Bureau administrators with the information necessary to adopt and implement FBACT. The study examined Florida Farm Bureau leaders' use of the Internet and how willing they were to be provided important legislative-related information via this technology. Although exploratory in nature, conceptually the study was based on two theoretical models: the Theory of Planned Behavior (Ajzen, 1991) and the Technology Acceptance Model (Davis, 1989). The Theory of Planned Behavior was used as the basis for questions to describe the political activity of the group. The Technology Acceptance Model was used to describe the level of technology use of Florida Farm Bureau members.

According to the Theory of Planned Behavior, human behavior is guided by three considerations: behavioral beliefs, normative beliefs, and control beliefs (Azjen, 2002a). Behavioral beliefs are beliefs about the likely or expected consequences of the behavior, expressed as attitudes toward the behavior or the degree to which performance of the behavior is valued. Normative beliefs are beliefs about the normative expectations of other people. Subjective norms are pressures to engage or not engage in a behavior and are produced by this particular set of beliefs (Azjen, 2002b). Control beliefs are beliefs

about the presence of factors that may further or hinder the performance of the behavior. Control beliefs translate into perceived behavioral control that refers to people's perceptions of their ability to perform a behavior (Azjen, 2002a). These three beliefs formulate a person's intention to behave in a certain way.

Hinkle et al (1996) studied what impacts the intention of group members to become active in a grassroots political campaign. Their research indicated that many grassroots organizations have little trouble finding people with attitudes that support their cause. The study suggested that people join the grassroots groups because their attitudes toward the behavior line up with the overarching subjective norms of the group. While most people have the ability and efficacy to actually become politically active, there are factors, such as lack of time and financial resources, contributing to their lack of activity (Hinkle et al, 1996). It was expected this study would indicate that Florida Farm Bureau members have positive attitudes toward the behavior of being politically active, have normative influences that support the behavior, and feel a high degree of perceived behavioral control with regard to this behavior.

The Technology Acceptance Model states two perceptions can cause people to accept or reject information technology: an individual's perceived usefulness of the technology and the perceived ease of use (Davis, 1989). According to this model, a technology that a person perceives to be useful and easy to use has a high likelihood of being adopted. For this study, questions were asked of Florida Farm Bureau members to ascertain their perception about the usefulness and easy of use of technologies that may be used in the FBACT process. However, there are factors, other than perceived usefulness and ease of use, that can impact a person's intention to adopt a technology

(Irani, 2000), such as the attitude people have toward using a technology and their degree of innovativeness. Therefore, it was necessary to assess Farm Bureau members' attitudes about the technology, a swell as assess their degree of innovativeness.

Methodology

A 105-question survey was sent via mail to a purposive sample of persons (N = 814) holding leadership positions in the following Florida Farm Bureau organizations: state board, county boards, advisory committees, women's committees, and Young Farmers and Ranchers. The leaders were selected for this study because it was believed they would be more apt to communicate with their legislative representatives and serve as an opinion leader in their communities. Questionnaire items consisted of a series of multiple choice, fill in the black and five-point Likert-type questions designed to assess communications preferences, contact with elected officials, communications technology use and attitudes toward communications technology, as well as respondent demographics.

A panel of 20 experts, representing the Florida Farm Bureau and the University of Florida's Department of Agricultural Education and Communication, reviewed the survey for face and content validity. A reminder postcard was sent two weeks after the initial mailing, resulting in 268 surveys returned, for a 33% response rate.

Results

Demographics

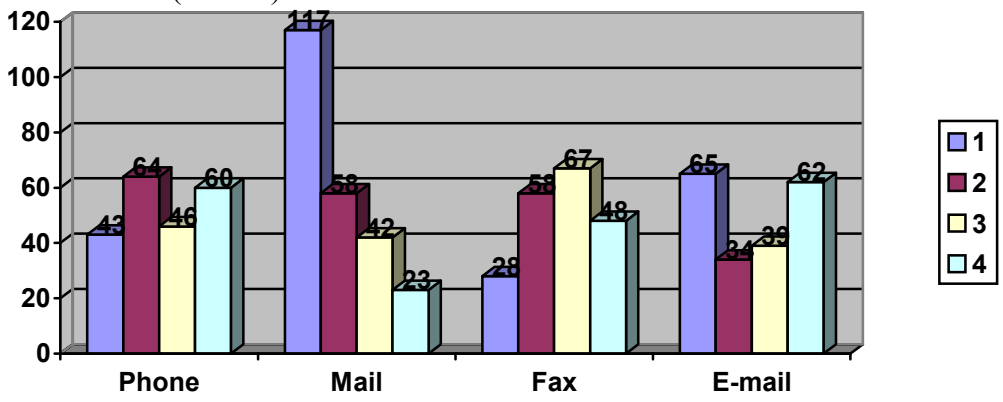
The majority of respondents were male: 88.1% (n=236) to 9.9% (n=26) female. Respondents were over the age of 46, with the age range almost evenly divided among 46-55-year-olds (23.9%, n=63), 56-65 (25.4%, n=67), and over 66 (23.5%, n=62). Only

72 (27.3%) were 45 or younger. Almost nine in ten owned a farm (87%, n=228) and most farmed full-time (62.6%, n=139). The average time working in their current position was 23.3 years. Respondents were not concentrated in one specific population area; 41.8% were from a rural area (population under 2,500), 31.2% from a small town (population under 25,000), and 27% from an urban area (population over 25,000). Most respondents had some college, an associate's degree, or a bachelor's degree (70.3%), with another 14.1% holding a graduate degree. Respondents were asked with which segment of Florida agriculture they were most closely involved. Responses varied, but the major segments were livestock (57%, n=147), citrus (23.9%, n=62), nurseries (19%, n=49), row crops (18.8%, n=48), and vegetables (17.9%, n=46).

Communication Preferences

The 268 respondents were asked to rank order how they would prefer to receive information via these four communication modes: telephone, postal mail, fax, or e-mail. Postal mail was the most preferred method identified. E-mail was evenly split between "most preferred" and "least preferred." (See Figure 1.)

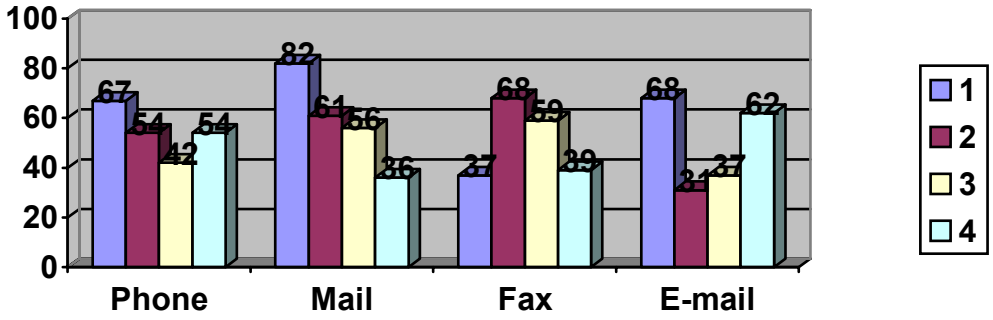
Figure 1. Florida Farm Bureau leaders' communication technology preferences to receive information (N=268)



"1=most preferred" to "4=least preferred"

The respondents also were asked to rank order their preference to send out information via the same communication modes. (See Figure 2.) The methods were much more evenly distributed, with postal mail slightly higher than the rest. Again, e-mail was almost evenly split between "most" and "least preferred."

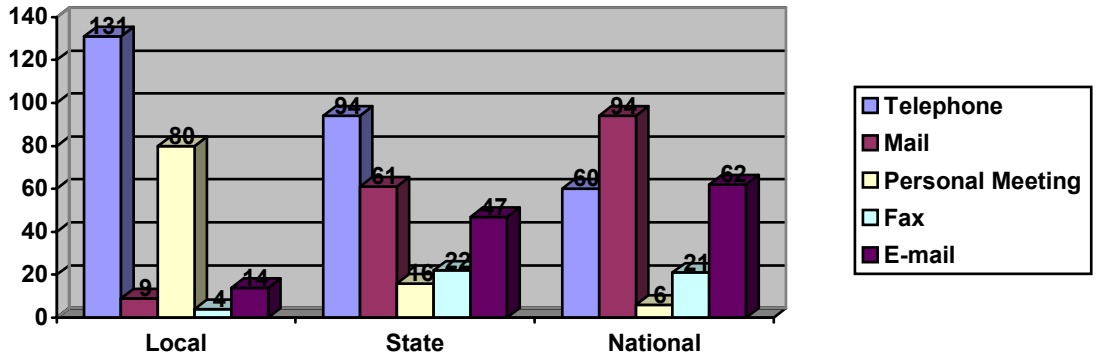
Figure 2. Florida Farm Bureau leaders' communication technology preferences to send information (N=268)



"1=most preferred" to "4=least preferred"

Respondents indicated which communication mode they would prefer using to communicate with officials at the local, state, and national levels. With this question, "personal meeting" was added to the possible responses. At the local level, the majority of respondents preferred a telephone conversation with an official, followed by a personal meeting. At the state level, telephone was the preferred method, followed by mail and e-mail. At the national level, mail was the most preferred, followed almost evenly by telephone and e-mail. (See Figure 3.)

Figure 3. Florida Farm Bureau leaders' most preferred communication methods to contact local, state, and national elected officials (N=268)



Political Activism

The Farm Bureau leaders were asked if they had ever contacted local (county commissioner, city commissioner, mayor), state (representative, governor), and federal (representative, president) officials about a particular policy or piece of legislation. The majority of respondents indicated they had contacted local officials (93.4%, n=241), state officials (89.1%, n=230), and national officials (76%, n=196). They also were asked which communication modes they used to contact the elected officials. (Respondents could mark more than one communication method.) At the local level, Farm Bureau leaders used personal meetings (72.6%, n=175), telephone (71.4%, n=172), postal mail/letters (30.3%, n=73), e-mail (13.3%, n=32), and fax (12.4%, n=30). At the state level, these methods were used: telephone (62.2%, n=143), personal meeting (55.7%, n=128), postal mail/letters (50.9%, n=117), e-mail (23.5%, n=54), and fax (23%, n=53). For officials at the federal level, these methods were used: postal mail/letters (60.7%, n=119), telephone (53.1%, n=104), personal meeting (37.9%, n=74), e-mail (32.8%, n=64), and fax (22.1%, n=43).

Leaders indicated that contacting their elected officials was important. On a scale of one to five, with one being "very useful" and five being "not at all useful," the mean responses of how useful they thought it was to contact their elected officials were as follows: local officials, M=1.39; state officials, M=1.66; and federal officials, M=2.00. The leaders also were asked to indicate how likely they would be to contact state or national officials about pending legislation. Table 1 provides the leaders' responses.

Table 1. Florida Farm Bureau leaders' likelihood of contacting state and national leaders

	Mean	n	SD
I would contact a state or national leader about legislation that has a direct negative impact on my community.	1.61	258	.7469
I would contact a state or national leader about legislation that has a direct negative impact on agriculture in Florida.	1.52	258	.7396
I would contact a state or national leader about legislation that has a direct negative impact on Florida farmers.	1.48	258	.6910
I would contact a state or national leader about legislation that has a direct negative impact on me.	1.42	258	.6693

"1=very likely" to "5=not at all likely"

Farm Bureau leaders indicated that communicating with elected officials was important. Leaders also believed they were qualified to communicate issues impacting Florida agriculture to their elected officials. (See Table 2.)

Table 2. Florida Farm Bureau leaders' attitudes about contacting elected officials

	Mean	n	SD
It is not important for me to contact my elected officials about legislation impacting Florida agriculture.	3.55	255	.8763
Elected officials in general do not listen to what agriculturalists have to say.	2.84	252	.8619
Others in my profession contact their leaders about legislation that impacts them.	1.91	250	.7689
I am qualified to contact my elected officials about issues that impact Florida agriculture.	1.67	256	.6445
By contacting my representative, I can make a difference.	1.59	259	.6209
Grassroots lobbying efforts are effective.	1.34	257	.5536

"1=strongly agree" to "5=strongly disagree"

Computer Technology Use

More than three-fourths of leaders had a computer (85.8%, n=229). They used computers for a variety of purposes, with the most popular reasons being Internet access (86.5%, n=199), e-mail (83%, n=191), financial record-keeping (59.6%, n=137), spreadsheet and data management (54.8%, n=126), recreation (40.9%, n=94), and educational programs (35.2%, n=81). Most did not have a personal or business Web site (70.3%, n=154).

A total of 217 (81.9%) had access to the Internet. Most (65.9%, n=137) had been using the Internet for more than three years. For those with Internet access, 93.1% (n=202) used their computers to send and receive e-mail; 90.2% (n=194) browsed the Web; 19.0% (n=40) participated in newsgroups; and 7.2% (n=15) participated in listservs. Seventy-seven percent (n=161) received e-mail newsletters. Respondents were fairly avid e-mail users, with 53.1% (n=104) checking e-mail once or more times daily, and another 27.6% (n=54) checking e-mail several times per week. In a typical day, respondents spent the following amount of time on the Internet: 30 minutes or less, 44.9% (n=92); 30-60 minutes, 23.9% (n=49); 1-2 hours, 19.5% (n=40); and more than two hours, 11.7% (n=24). For those who did not have access to the Internet, the majority (81.3%, n=26) did not plan to ever get Internet access.

The primary reason respondents gave for using the Internet was to “use e-mail” (50.6%, n=83), with “research” coming in a far second (14%, n=23). “Market information” (9.8%, n=16) and “monitor weather” (8.5%, n=14) were third and fourth, respectively. Internet users accessed the Internet primarily at their home or home office (71.7%, n=147), followed by “work or office away from home” (28.3%, n=58).

Respondents indicated that Internet service providers were almost evenly divided among AOL (33.7%, n=68), another national provider such as Juno, Earthlink, or MSN (27.7%, n=56), or local provider (27.7%, n=56). Twenty-two (8.2%) responded "other." The majority used a dial-up modem connection (69.6%, n=144), with the remainder with a DSL or cable modem connection.

Respondents were asked to indicate their proficiency in performing various online tasks. Responds tended to be either more neutral or more negative than positive regarding their opinions about how well they could perform these Internet-related functions. (See Table 3.)

Table 3. Florida Farm Bureau leaders' ability to perform online tasks

	Mean	n	SD
Sending and receiving e-mail.	3.01	212	1.014
Opening e-mail file attachments.	2.78	208	2.788
Downloading text files.	2.60	204	1.111
Downloading Adobe PDF files.	2.51	193	1.164
Downloading audio and video files.	2.17	192	1.097
Using newsgroups.	1.83	181	1.099
Using listservs.	1.62	175	.9380
Using chat rooms.	1.58	173	.9766

"1=poor" to "4=excellent"

Respondents had not been to Farm Bureau-related Web sites much in the past six months. The Florida Farm Bureau leaders had visited the Florida Farm Bureau's site infrequently, with 54.1% (n=113) not having visited the site at all in the past six months, and only 5.3% (n=11) visiting it more than six times in six months. The American Farm Bureau's site faired worse, with 80.2% (n=166) not visiting it in the past six months, and only 2.4% (n=5) visiting it more than six times. Other Florida agriculture sites faired a little better. The University of Florida's Institute of Food and Agricultural Sciences site was not visited by 90 Farm Bureau leaders (43.7%), but was visited six or more times by

17.5% (n=36). The state's Department of Agriculture and Consumer Services was not visited by 88 leaders (42.7%) in six months; 24 (11.7%) visited the site six or more times in that timeframe.

Communication Technology Attitudes

Overall, the Farm Bureau leaders were positive about the use of communication technologies. Many attitudinal questions related to the use of e-mail as a tool to keep Farm Bureau leaders informed or to the use of e-mail as a substitute for postal mail, the telephone, or face-to-face meetings. With the exceptions of telephone conversations and face-to-face meetings, leaders believed e-mail was a fair substitute for communication methods and were positive about the use of e-mail. (See Table 4.)

Table 4. Florida Farm Bureau leaders' attitudes about communication technologies

	Mean	n	SD
E-mail can be a good substitute for face-to-face meetings.	3.13	218	.9744
E-mail can be a good substitute for telephone conversations.	2.46	214	1.064
I would prefer receiving regular mail rather than e-mail.	2.43	226	1.167
The majority of farmers in Florida do not use e-mail.	2.34	194	.7599
Weekly e-mail alerts would be a good way for me to stay informed about an organization.	1.97	211	.9123
E-mail can be a good substitute for regular mail.	1.96	216	.9836
I feel comfortable sending and receiving e-mail.	1.82	214	1.005
Most public officials see electronic communication as a credible source of communication.	1.82	196	.7969
Most of the people in my profession see electronic communication as a credible source of communication.	1.78	206	.7415
E-mail makes communication easier.	1.78	217	.8774

"1=strongly agree" to "4=strongly disagree"

Discussion and Conclusions

Respondents in this study were Florida Farm Bureau leaders, representing many Farm Bureau subgroups. Most were college-educated males, owned a farm, and raised livestock. Respondents used communication technologies frequently, expressed competence in basic technology procedures, and actively communicated with elected

officials at the local, state, and federal levels. They preferred to receive and send information through the mail.

In terms of their preference for sending and receiving information by e-mail, respondents were almost evenly split between e-mail being their "most" and "least preferred" communication method. This finding has interesting implications for the Florida Farm Bureau's online communication program. Perhaps respondents have received too many spam messages, causing them to dislike sending and receiving e-mails. The Farm Bureau will need to monitor the number and frequency of its e-mail alerts so that volumes of messages do not bombard recipients.

In addition, for Farm Bureau's Agricultural Contact Team to succeed, Florida Farm Bureau must ensure that the program stays as simple as possible initially. Respondents in this study indicated that although they use e-mail frequently, they are not adept in some online processes, such as downloading audio and video files and using chat rooms and listservs. A recommendation from this study would be to implement Internet training programs for Farm Bureau leaders.

Farm Bureau leaders indicated that e-mail would be an adequate substitute for some forms of communication. However, the leaders were less likely to say that e-mail would be a good substitute for more personal methods of communication, such as telephone conversations or face-to-face meetings. As evidenced by the ways the leaders communicated with elected officials, especially at the local and state levels where the leaders relied more heavily on personal communication methods, leaders may be less likely to adopt e-mail to communicate with officials in close proximity to themselves. The Farm Bureau leaders had used less personal methods of communication with federal

elected officials in the past; therefore, e-mail may be a stronger communication possibility for federal officials. These findings indicate that a "one-way-fits-all" online method of communicating with elected officials may not always be the most effective communication method; more personal ways of communicating, especially at the local and state levels, may still be best for some issues. However, for "quick votes" where it is important to communicate en masse rapidly, the online method has distinct advantages. As noted, Florida Farm Bureau already has implemented the Farm Bureau's Agricultural Contact Team because of the need to get a grassroots effort on bills and policies moving quickly and efficiently.

This study indicates that Farm Bureau leaders, in particular, and agriculturalists, in general, actively contact politicians at all levels of government. The leaders also expressed their desire to take a strong role in communicating with officials when policies negatively impacting agriculture are being considered. This finding shows that to get agriculturalists involved politically, an issue must be framed that appeals to their sense of responsibility to their community, fellow farmers, and the agricultural industry, as a whole. Finally, results imply that although agricultural industries and rural areas may not have the political clout of high population centers behind them, as urban areas do now, they can and do flex their political muscle in given circumstances.

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