

**INFLUENCE OF NEWSPAPER IMAGES ON STUDENT PERCEPTIONS OF
AGRICULTURAL ISSUES**

A Thesis

by

AMY LYNN DROMGOOLE

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

May 2012

Major Subject: Agricultural Leadership, Education, and Communications

Influence of Newspaper Images on Student Perceptions of Agricultural Issues

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Approved by:

Chair of Committee, Tracy A. Rutherford
Committee Members, Christopher Boleman
Christopher Skaggs
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ABSTRACT

Influence of Newspaper Images on Student Perceptions of Agricultural Issues.

(May 2012)

Amy Lynn Dromgoole, B.S., Texas Tech University

Chair of Advisory Committee: Dr. Tracy Rutherford

In today's technological environment, there is constant competition for audience readership and viewership between various media outlets. News media provides a great deal of information to the general public through television, print, and web sources, especially in terms of agriculture. This study aimed to discover audience perceptions of two different natural disasters by examining the effects of photographic inclusion in print news articles including agricultural perceptions and content recall. Additionally, differences between self-perceived milk industry advocacy and a milk campaign story are also examined. Newspaper articles about the effects of the 2010-2011 drought in Texas and the aftermath of Tropical Storm Irene were also used. Students in the College of Agriculture and Life Sciences at Texas A&M University were surveyed in online pre and posttests.

Student responses displayed a moderate relationship between photos and article content in regards to the Hurricane Irene article. A significant relationship was present between self-perceived non-advocates and their outlook on milk consumption and the dairy industry with the inclusion of photographs. There were differences seen between students who have family who work in agriculture, claim membership in an agriculture

association, live on a farm or ranch, and were members of FFA as they viewed the drought article to be more positive than those who did not have these agricultural backgrounds. Furthermore, student responses show a relationship between the milk industry article in the pretest (photos included) and posttest (photos not included) by viewing the photos as positive, humorous, and shocking.

This study found student perceptions of the two news articles related to the drought as well as the tropical storm to be the same regardless of photographic presence. This leads the researcher to conclude that photos had no effect on the overall perceptions of the news stories. However, students who received photographs did see a relationship between the photos associated with the flood article and the content presented in the story. This effect was not seen with the photographs of the drought story. Since the photos associated with the flood story were the original photos printed with the news story, it is probable to conclude that students properly associated photographic elements with that of the story's content.

DEDICATION

I dedicate this work, this degree, to my wonderful parents. With your support this would not have been possible. Thanks for listening to me cry over statistics and put up with me for the past 22 years. Everything I have I owe to both of you and without you achieving this goal would not be possible.

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CHAPTER I

INTRODUCTION

In today's technological environment, there is constant competition for audience readership and viewership between various media outlets. News media provides a great deal of information to the general public through television, print, and web sources. More specifically, these sources are known to direct public thought in the scientific field of agriculture. Such a scientific industry presents many challenges when communicating issues, because the industry often deals with highly complex topics and copious amounts of scientific information. Since photos are understood to enhance viewer emotion toward the subject of a photograph (Rosser, 1998) and enhance comprehension (Brown, 1987), images and text are almost always inseparable. Therefore, it is pertinent to coordinate the information within an image to content within text (Zillmann, Knobloch, & Yu, 2009).

Research shows the limited treatment of agricultural issues in popular press (Whaley & Doerfert, 2003). Therefore, it is essential to have accurate portrayals of agriculture in the popular press, because, negative stereotypes are often the result of inaccurate photographs (Rhoades & Irani, 2008).

The design and use of images has long been examined in academia because of changes in the visual presentations of media outlets. Throughout history, colored images, television, and the Internet have transformed how communicators

This thesis follows the style of the *Journal of Applied Communications*.

disseminate information. More specifically, the front pages of newspapers became more eye-catching after the implementation of television in our culture in order to retain interest (Cooke, 2005).

In the 1970s and 1980s, newspapers changed their layouts to compete with television sources that provided “rapid-fire” information. Newspapers, which are not based upon quick message delivery, battled this new form of rapid communication by adding striking images to news stories. Information that was closely related was grouped together with images in order to entice readers. Photos were also the primary graphic element to appear in news stories (Cooke, 2005).

This study aimed to discover audience perceptions of two different natural disasters: tropical storm Irene and the 2010-2011 drought in Texas. Newspaper articles about each of these events were used.

Since a drought has recently affected the Texas economy, the Texas cattle industry, and agriculture as a whole. During the “Towards a Compendium on National Drought Policy” meeting held in Washington, D.C. The drought situation and policy all over the world was overviewed in the proceedings (Sivakumar, Motha, Wilhite, & Qu, 2011). It was decided that:

given the current concerns with climate change, projected increases in the frequency, intensity, and duration of droughts and resulting impacts on many sectors, in particular food, water, and energy, there is cause for concern regarding the lack of drought preparedness and appropriate drought management policies for virtually all nations. (Sivakumar, Motha, Wilhite, & Qu, 2011, pp. 9).

More specifically, from September 2009 to July 2010 Texas experienced a great deal of rainfall. However, in August 2010, aside from a few isolated showers, the state remained completely dry. During this period, most of Texas faced the 4th driest period on record. Texas A&M's AgriLife Extension Service estimated that this drought is likely to be the costliest in a 12-month span. In May 2011, AgriLife reported losses statewide at \$1.2 billion. The cost of the current drought may be even twice that of the previous most-costly drought, which cost \$4.1 billion in 2006 (Sivakumar, Motha, Wilhite, & Qu, 2011).

Additionally, Tropical storm Irene caused catastrophic effects on the farmers of New York and their crop. New York Governor set aside a \$15 million dollar agricultural recovery fund to help supplement the almost 100 percent lost crop (WBNG, 2011).

Since it is imperative to evaluate popular press images that are paired with news stories in agriculture, these natural disasters and economic hardships make it plausible to examine the effects the media may or may not have had on these separate events.

Literature Review

Conceptual Framework

The study primarily focused on the idea of visual literacy and the basis of cognitive theory and reality monitoring (Johnson, 2007). The concept of a cognitive springboard is allowed for the exploration of the persuasive effects of photographs in print news articles (Henkel, 2011).

Bandura's (1986), theory of social cogitation in mass communications outlines that people have the capability to reflect and self-examine their thoughts and beliefs. Humans then use symbolism as a powerful tool to shape their thoughts within respective environmental events. Thus, leaving lasting effects and emotional impacts that motivate and drive their behaviors.

This theory is easily implemented into that of mass communication because these symbols (in this case photographs) are easily identified in the human mind causing a "cognitive springboard" effect to drive peoples' thoughts and opinions on various mass media issues (Henkel, 2011). When thinking about photographic effects, this concept illustrates that photos act as subtle forms of manipulation because those who view the photographs clearly associate thoughts and feelings to images; because as humans, we use our cognitive mental processes and see photos as visual representations of events (Henkel, 2011).

The notion that cognitive structures can be seen as prerequisites for human knowledge and knowledge acquisition and its effects on human recall can also be explored (Bransford & Johnson, 1972). In order to understand this effect and its

steadfastness within the human mind, one could look at research involving criminal testimonies (Wade, Green, & Nash, 2010). Wade, Green, & Nash (2010) found that when provided with false images people often recounted eyewitness accounts differently than the manner in which they actually occurred. Thus proving that distortions are present when humans process images and memories.

The concept of media and reality monitoring was similarly touched on throughout this study. This theory explains that individuals call upon the information they see in stories and advertisements to shape their memories, knowledge and beliefs. This theory recognizes the fact that the media has both intended and unintended effects and that it can affect the thoughts of producers and consumers (Johnson, 2007). It is important to increase our understanding of cognition, emotion, and social processes because we can then help clarify socially important issues concerning the impact of media on individuals and groups (Johnson, 2007).

Systematic research has focused on the effects the media has on the understanding “cognition, emotion, and social processes by expanding the questions we entertain as well as testing the generality of our theoretical ideas and feelings” (Johnson, 2007, pp. 982).

This school of thought is solidified throughout basic research in education, eyewitness questioning, jury decision-making, suspect questioning, and psychotherapy. These efforts throughout the course of research have helped teachers, lawyers, therapists, and the creators of media narratives with their understandings of the human mind and its processes—especially in relation to images within the mind (Johnson, 2007).

The combination of these concepts will explore the visual effects of photographs in print news in order to give further insight to the effects various photographs in media outlets (newspapers) has on the human mind in terms of perceptions and recall. This will aid in the understanding of agricultural issues in popular media.

Visual Effects of Photographs & Recall

Most conclusions drawn from images in American print publications are based on American culture (Norwood-Tolbert & Rutherford, 2009) and the personal experience of each individual (Anderson, Dewhirst, & Ling, 2006). These conclusions often define the individual making them, (Anderson, Dewhirst, & Ling, 2006; Brandth, 1999) which makes it increasingly important to understand the overall perceptions of images in American culture. Understanding perceptions is equally important so researchers can better understand how to communicate agricultural issues to the public (Rhoades & Irani, 2008) because not only are audiences viewing images but looking to them to define and shape their views and opinions.

In general, mass communication research often lends itself to the study of the effect of individuals and the ways in which they learn and process information (Mendelson, 2004). It has been proven that photos are one of the first elements seen in a newspaper and often noticed when the accompanied article is not read (Rodgers & Thorson, 2000). Photos in newspapers are also looked at more closely than the story and captions associated with them (Mendelson, 2004) and these photos are also often utilized in news reports to illustrate a point or points made in an article (Gibson & Zillmann, 2000).

Gibson and Zillmann (2000) found that those who read balanced news reports paired with photographs that depict one side of the story, have distorted perceptions of the issue being reported on. This conclusion proves to be the fundamental research of this study. Prior, Zillmann, Gibson, and Sargent (1999) discovered when images are paired with images that represent both sides of an issue the perceptions are not distorted by readers. Therefore it is safe to presume that the content of news photos is as important as the stories themselves (Rodgers & Thorson, 2000) since they are relied upon to make long and short-term impressions (Zillmann, Knobloch, & Yu, 2009). This effect also becomes a difficult force to battle because people have difficulty distinguishing actual events from what they perceive through photographs (Henkel, 2011).

When this information is put into consideration it is probable to assume that the careless use of photographs can lead to misconceptions about various issues (Zillmann, Knobloch, & Yu, 2009). Since journalists often consider page design rather than the impact of photographs in their newspapers, photographers, reporters, and editors must “be cognizant of the fact that their choices of photographs may have considerable impact on how readers will view the issue address in print news” (Zillmann, Gibson & Sargent, 1999, pp. 225). Additionally, since readers may take cues from visual information that the news gatekeepers did not intend to invoke, thus altering the perceptions of readers unintentionally (Gibson & Zillmann, 2000).

Henkel (2011) solidified that the effects of photos can shape people’s memories and experiences. The study also reveals that people make inferences from “photo-boostered stories” whether the photo accurately depicted the story and proved people tend

to abandon their memories and previous conceived notions about issues when photos were present, and were often most confident their memories and thoughts were true when a photo was present, even if the photo depicted something otherwise. This effect is attributed to the fact that photos are seen as “recordings of what happened” and the sheer existence of a photograph acts as evidence that the event photographed occurred as shown (Henkel, 2011).

David and Kang (1998) found that since “vivid and highly captivating pictures are memorable, high-imagery copy too can have significant effects on memory” that there is significant gain in recall with the addition of photographs and verbal imagery language in students. Pre-teenage children and their recall of advertising products also increased with more vivid and audience appealing graphics (Gunter, Baluch, Duffy, & Furnham, 2002). In terms of news articles, it was also found that photographs have the ability to enhance the news media’s effect on readers (Gibson & Zillmann, 2000).

Images in Advertising

The feelings and connotations conjured within various audiences can be easily identified when looking at semiotic analysis of various advertising campaigns. Although this study focuses on news articles, advertisers also intentionally choose specific photographs to generate responses from target audiences (Henkel, 2011). This is because in brand-sensitive cultures, like that of the United States, when an individual consumes a certain product, he or she also engages in an act of social distinction (Anderson, Dewhurst, & Ling, 2006). In order to examine social distinction, an investigation of brands that are traditionally associated with cultural meanings because of the use of various symbols and product advertising often occurs (Anderson, Dewhurst, & Ling, 2006).

Because the art of interpreting messages within images, is an active process, (Norwood-Tolbert & Rutherford, 2006) various conclusions can be established from one image (Anderson, Dewhurst, & Ling, 2006). This is especially important to recognize when looking at semiotics within images because it gives insight to relationships between textual elements and photographs—especially in disciplines that require an awareness of various cultures. This is also known as social identity and is examined in a study of tobacco advertisements (Anderson, Dewhurst, & Ling, 2006). Research found in the American market, Marlboro brand cigarettes were reported to symbolize rugged, masculine, independent, and heroic characters, while the Virginia Slim brand has traditionally displayed women's liberation, femininity, and glamour. These brands have customarily engaged in these cultural meanings through the use of symbols and

appropriately themed product advertising in order to target their intended audiences (Anderson, Dewhirst, & Ling, 2006).

This is significant because the tobacco advertisement study further solidified the thought that images create and solidify a brand and a meaning associated with that brand in American culture. It was imperative to discover that “understanding what message channels and content are most effective for the tobacco industry can guide policymakers in devising both adequately responsive and knowledgeably proactive measures for minimizing the tobacco industry’s marketing effectiveness” (Anderson, Dewhirst, & Ling, 2006, pp. 260).

Images in Agricultural Advertising

A look at a semiotic case study on a Tractor Supply Company advertising campaign by Rhoades and Irani (2008) gives further insight to the manner in which the public views photographs. The purpose of this study was to discover how simplistic images in the advertisements played into common agricultural stereotypes. The stereotypes discovered included a male-dominated industry, loyal wives, a rural work ethic, and patriotism (Rhoades & Irani, 2008).

In this advertising campaign, photos of rural life were used in print advertisements. Photos from publications like America’s Horse and Western Horseman were ascertained and dissected to identify the individual signs. Then the signs were explored to discover what they signify when standing alone and in relation to other signs and text in each advertisement. Finally, the connotative and denotative symbols were

analyzed, followed by an entire analysis of the ideology that was being viewed by each possible consumer (Rhoades & Irani, 2008).

The photographic technique ads were found to connect potential consumers to the Tractor Supply Company by making them look like a snapshot from a passerby's camera. These photos make it apparent that their purpose was to demonstrate the ideology of what rural life looks like. Simplistic images such as pitchforks and hardworking men, paired with patriotic colors, romanticize the ideal of agriculturists working in a serene environment. Overall, the analysis of these advertisements generated a better understanding of how this campaign portrayed a rural lifestyle (Rhoades & Irani, 2008). However, the stereotypes of farmers presented in these advertisements were found to be both negative and positive. Therefore, it was concluded that agricultural communicators must continue to study how rural environments are portrayed in mass media (Rhoades & Irani, 2008).

In keeping with the idea of cultural understanding of mass media images, Brandth (1995) analyzed tractor advertisements in the same manner. It was found that tractor advertisements show masculine images of tractor advertisements to validate men in their masculine identities. This is all despite the fact that the advertisements boast new technologies that are easy to use by men and women. However, after examining several tractor advertisements, the study found the advertisements still showed symbolic masculine images in farming and large machinery and interpreted men as the primary decision makers in regards to investments in farm machinery. These conclusions

reached, further validate that images and ideals relating to agriculture are highly variable to individuals and their cultural perceptions (Brandth, 1995).

These campaign analyses are crucial to the understanding of all photos in advertisements due to the fact that advertisers often do not intentionally set out to portray a product in a certain light. However, the meanings hidden within these images can still have an effect on the individuals viewing them (Bandura, 1986; Rhoades & Irani, 2008).

Images in News Articles

After examining how, in general, images in advertisements shape our cultural views, it is vital to examine the manner in which audiences view news articles associated with images (Zillman, Knobloch, & Yu, 2009). Readers differ in how they respond to the same textual elements, which may indicate varying personal and cultural histories (Anderson, Dewhirst, & Ling, 2006) such as their knowledge of the agriculture industry, Rhoades & Irani, 2008) or simply how much time they spend reading an article that is associated with a photograph (Zillmann, Knobloch, & Yu, 2009).

Since it is known that photographs are imperative to forming short and long-term viewer impressions (Zillmann, 1999). Zillmann, et al. (2009) delved further into the subject by examining length of time articles were read by participants in order to determine if compelling images conjured more curiosity about the subject matter than the news articles that weren't accompanied with compelling images. The study asked respondents to view twelve news articles relevant to the public. They were not given a timeline or instructions regarding how long or in which order to read the articles. The

results revealed that articles accompanied by photos were read and assessed for a longer period of time. Additionally, the more compelling photographs yielded an even greater amount of viewing time from readers (Zillmann, 2009).

This persuading effect can also be seen when examining a semiotic analysis of Hilary Clinton and Barack Obama images in a 2008 Time article during the democratic primary elections (Goodnow, 2010). The article titled “The Great Divide” showed four pictures of each candidate. The photos of Clinton were in black and white and showed her reviewing papers and doing office duties. The photos of Obama were in color and showed him playing with his children and reviewing papers with his wife. The study found that the Obama photos were easily identified as family photographs while Clinton’s photos were reminiscent of hard line news articles (Goodnow, 2010).

Although this study did not try to state that the article influenced the outcome of the election, it does state that it was crucial to solidifying and contributing to the overall public perception of each of these candidates (Goodnow, 2010). This example further solidifies the importance of proper and accurate photos in the news because the popular press has great influence on public opinion (Zillmann, Knobloch, & Yu, 2009).

Photos in Agricultural News Articles

When researching agricultural issues, “it is essential to take inventory of what images are portraying and saying about rural culture and ideologies” (Rhodes & Irani, 2008, “Conclusions,” para. 5) since stereotypes are being formed and reinforced through visual content and symbols (Norwood-Tolbert & Rutherford, 2006).

As previous agricultural-related articles displayed, often misconceptions are held about various topics (Rhoades & Irani, 2008). This can also begin to affect the identity and overall conclusions Americans make about certain topics (Stokowski, 2011). To understand these various perspectives on agriculture, it is beneficial to look at a study of semiotics in biotechnology and food safety in popular American news magazines. This study evaluated 45 related photographs in *Time*, *Newsweek*, and *U.S. News & World Report* (Norwood-Tolbert & Rutherford, 2009).

Because American culture plays a huge role in the perceptions of photographs and linguistic signs, all the photos in the study were coded based upon American culture. This is because to read words or view a photograph, the viewer must be familiar with the culture at hand. The photos were categorized into food, animals, industry workers, animals with scientists, producers, and foreign subjects (Norwood-Tolbert & Rutherford 2009).

The 45 photos were all found to fit the semiotic categories listed above. *Newsweek* was found to have the most negative photographs relating to agriculture, while *U.S. News World Report* and *Time* had more positive connotations in their photos. The overall balanced coverage was found to be of value to the news industry (Norwood-Tolbert & Rutherford, 2009).

This study concluded that it is imperative that agricultural communicators and others in the industry become proficient in producing magazine-quality photos, so an accurate portrayal of agriculture is put forth into popular media. These findings increased the attention of media literacy importance and the need for photographers from

these national newspapers to understand the subjects they are photographing when in the field (Norwood-Tolbert & Rutherford, 2009).

Thus, an understanding of various audiences' cultural cues, and issue perceptions is necessary in advertising as well as journalism to reveal the appropriate messages. This concept also translates into agriculture. As Rhodes and Irani (2008) noted, "it is imperative as communicators that we continue to study how rural cultures are portrayed in the media" (Rhodes & Irani, 2008, "Conclusions," para. 5).

Perceptions of Agriculture

More specifically to the agricultural industry, some of the most controversial issues that are debated in our country often involved agriculture issues (Robert & Lawver, 1995).

According to Frick, Birkenholz, Gardener, and Machtmes (1995a), people of all ages and ethnic groups understand the importance of agriculture but have limited knowledge about agriculture and food production. Many would agree with the need for a basic understanding of agriculture, the agricultural industry, and its importance to our wellbeing (Holz & Jost, 1995; (Frick, Birkenholz, Gardener, & Machtmes, 1995a; Norwood-Tolbert & Rutherford, 2009).

Nonetheless it is important for "consumers as well as policy makers to be 'agriculturally literate' in order to respond appropriately as issues arise" (Frick, Birkenholz, Gardener, & Machtmes, 1995a pp. 1).

One study involving focus groups with Iowa middle school students found:

“Youth equated agriculture with farming, but made no connection to the technical or research-intensive aspects of agriculture. For example, farming was perceived to be hard, physical labor and stressful because of machinery breakage, weather uncertainties, and price variances. However, genetics, research, engineering, financial management, or international commodity markets were not mentioned by the youth” (Holz-Clause & Jost, 1995, “Findings,” para. 1).

Restated, the same students tended to understand that farmers were an important part of rural and urban society but did not have an interest in an agriculture career due to the fact that they only equated agriculture with farming rather than other aspects of the industry (Holz-Clause & Jost, 1995).

Furthermore, perceptions of agriculture tend to identify with the common and dominate ideologies of what rural life looks like, (Norwood & Rutherford, 2009) for example, youth equated farmers with other general stereotypes such as overalls, chewing on straw (Holz-Clause & Jost, 1995), plaid shirts, and pitchforks (Smith, Park, & Sutton, 2009).

Moreover, research reveals that the urbanization of the population of the United States has contributed to inaccurate perceptions and low awareness of the agriculture industry (Robert & Lawver, 1995). An example of this is a study on urban high school students near Cornell University. Those surveyed did not feel that farmers made a lot of money, and were unaware of the important agriculture commodities leaving the state of New York. Conversely, those who lived on farms or in more rural areas had more

positive and accurate perceptions of agriculture. Urban students also were not considered agriculturally literate despite the fact that New York's land grant school was close to the surveyed high schools (Smith, Park, & Sutton, 2009). A study on rural students involving eleventh grade students also found that although students that were studying agriculture in high school have a greater knowledge of agriculture, a weak positive relationship existed between knowledge of agriculture and perception of agriculture scores (Wright, Stewart, & Birkenholz, 1994).

In a 1995 study university students gave insight to views on agriculture. It was found that they perceived America's food supply to be safe and said agriculture positively impacts our economy. In terms of college major, students from the law and education schools had the same perceptions as college of agriculture students. However, students from other colleges differed from the college of agriculture students on one or more factors (Robert & Lawver, 1995). Furthermore, agricultural communications students, Agriculture Communicators of Tomorrow and those enrolled in agricultural communications courses at 11 universities were found to have more positive perceptions of agriculture if their families owned agricultural property, or had lived on a farm or ranch (Wingenbach, Rutherford, & Dunsford, 2003).

In terms of agricultural organizations, 4-H and FFA are also represented in previous studies of agricultural perceptions. Frick, Birkenholz, & Machtmes (1995b) found in a study involving Midwestern 4-H members that 4-H members understood agriculture most in the areas of natural resources and marketing of products and the lowest in terms of plant production. Also, those 4-H members from farms of 10 to 50

acres and were enrolled in a high school agriculture program produced positive perceptions of agriculture while those who were not enrolled in a high school agriculture program produced less positive perceptions of agriculture (Frick, Birkenholz & Machtmes, 1995b).

Methodology

Purpose

The purpose of this study was to identify students' perceptions of agricultural news articles when accompanied with various photographs.

Objectives

The objectives of this study were to:

- (a) Determine if a significant difference existed in students' perceptions of print news story when compared by photographic presence;
- (b) Determine if a significant relationship existed between students' perceptions of news stories content and accompanying photos;
- (c) Determine if significant differences existed in students' perceptions of print news story photographs when compared by self-perceived advocacy status (milk consumption and dairy industry);
- (d) Compare students' memory recall of print news article content when compared by photographic presence;
- (e) Determine if significant differences existed in students' perceptions of print news articles' content when compared by selected demographics;

- (f) Determine if significant differences existed in students' perceptions of print news articles' content when compared by self-perceived advocacy status (milk consumption and dairy industry).

Study Design

The descriptive study conducted aimed to explain if photographs had an effect on the perceptions of agriculture in news articles pertaining to natural disasters. A pretest-posttest design was used to compare treatment groups with the treatment being photographs. During the initial experimental session, respondents were asked to read three news reports. One involved a poorly executed California milk campaign, which acted as the control of the study in order to maintain a baseline of data. The other two articles addressed the cattle industry during the 2011 drought in Texas and a flood plain in New York after tropical storm Irene. The article regarding the drought in Texas interviewed cattle ranchers from other states that were benefiting from the reduced prices on Texas cattle sold. While the article about the flood plain in New York interviewed the farmers who were affected in the region after tropical storm Irene.

Half the sample received these articles with photographs while the other half received the same articles without photographs. The milk article was not altered in any way, including the images, and served as a constant. The drought in Texas and article had images manipulated while the flood article kept the original images ran in the newspaper.

An interval of ten days separated the pretest and a recall-based posttest. The participants' perceptions of drought in Texas and the flood plain in New York were determined upon analysis of data collected from a survey.

Two introductory courses at Texas A&M University were surveyed with a ten-day time period between each survey instrument. The classes included class *AGLS 101—Modern Agricultural Systems and Renewable Natural Resources* and an introductory agricultural communications course *AGCJ 105—Introduction to Agricultural Communications*.

These two courses comprised of 336 freshman, 200 sophomores, 102 juniors and 50 seniors in the population. They also majored in 43 different majors at Texas A&M University.

The two agricultural classes allowed for the analysis of the agricultural perceptions, under the assumption that these students have an understanding of agricultural issues. This further expands the study when looking at possible media bias because it is assumed these students have a basis of understanding in terms of agriculture.

Population

The population of interest for this study was College of Agriculture and Life Sciences students at Texas A&M University. Based on the 2011 enrollment report from Texas A&M, undergraduate enrollment at the university was 39,867 with 5,631 of these students enrolled as agriculture majors (Office of Institutional Studies and Planning, 2011). These two courses surveyed comprised of 336 freshman, 200 sophomores, 102

juniors and 50 seniors in the population. They also represented 43 different Texas A&M University majors.

Two course sections of *AGLS 101—Modern Agricultural Systems and Renewable Natural Resources* and one section of *AGCJ 105—Introduction to Agricultural Communications*. However, the students in the accessible population were not all agriculture majors. These students were selected because they were assumed to have some interest and base of knowledge about agriculture regardless of major. AGLS 101 had 581 students enrolled while AGCJ has 104 students enrolled. A total of 676 surveys were distributed to all enrolled in these two courses.

Sample

The same demographic questions were presented to the entire sample. A response rate of 42% (290 students) was reported for the initial survey. 92 respondents received news reports with no accompanying photographs while 198 students received news reports with photographs. Each student had an equal and independent chance of being assigned to each group.

A response rate of 59% (155 students) also responded to the second follow-up survey. An interval of 10 days separated the pretest and the posttest.

Instrumentation

The research instrument consisted of a both pre and post surveys to measure student perceptions of images used in two agricultural-related news articles. The pre-study recipients could have received a survey with photographs or no photographs. This study was approved by the Institutional Review Board (IRB#2011-0879).

All surveys utilized a five-point Likert-type scale. These were worded so the students' reactions to them were reflective of both positive and negative statements. Students then responded as to whether they *strongly disagreed, disagreed, agreed or strongly agreed* to the statements. This strategy was based upon Measurement of Communication Behavior book (1989) and the attitude measurement methods described in the book (Barker & Emmert, 1989).

The first instrument (pretest) was comprised of three news articles. The first article, "*Milk Campaign Ended Amid Social Media Firestorm*" was the constant in both surveys and included photos. This article was released in the *New York Times* on July 22, 2011, and was chosen because of its wide appeal to many audiences and its fairly uncontroversial topic in relation to agriculture. The twelve questions following the article asked about respondent perceptions of the article, as well as the associated images. Aside from this article, one group received the following two news articles with photographs while the other received no photographs.

The second article, "*As ranchers in drought-stricken southwest sell cattle, some northern states see chance to grow,*" contained twenty statements about the perceptions of the article as well as the images associated with the article. This article was released from the *Associated Press* on September 12, 2011, and was printed in multiple nationwide newspapers. This article was chosen because of the relevance it holds to the drought situation in Texas. In this article out of state farmers are interviewed and state the drought has benefited their out-of-state cattle businesses because of reduced prices on Texas cattle.

Additionally, the third article, “*Upstate farmers find that a fertile flood plain is a two-edged sword*,” also contained twenty statements about their perceptions of the article as well as the images associated with the article. This article was also obtained from the *New York Times* and was released on August 30, 2011. This article was chosen because of the relevance it holds to the flood situation in New York. It interviewed farmers in New York who had suffered personal loss from the tropical storm and personal accounts of their declining business were recorded.

Ten days following the initial survey, a follow-up instrument (posttest) was sent to the respondents to the initial survey. The first article, “*Milk Campaign Ended Amid Social Media Firestorm*” remained constant in terms of questions but had photographs removed. The other two articles were presented, with all photos removed, and included statements about their long-term perceptions and recall of the articles’ content using a 5-point Likert-type scale (Barker & Emmert, 1989).

Students’ demographic information pertaining to their agricultural background was collected in the pretest as well. These questions included if their family is involved in agriculture and the type (production, retail, or processing) if their family is involved in agriculture, agricultural associations, if they live on an active farm or ranch, and the size of their hometown (rural, suburban, or urban). They were also asked if they were involved in 4-H and FFA in high school.

Article perceptions of the drought and flood articles (questions 1-11) in the pretest were summated to produce a Cronbach’s alpha of .75 and .71, respectively. Questions 3 and 4 were omitted from both article questions, as they did not contribute to

overall reliability. Photo perceptions of the drought and flood articles (questions 12-20) in the pretest were also summated to produce a Cronbach's alpha of .84 and .72, respectively. Questions 14 and 15 were reverse coded in the drought article in order to accurately depict student answers. Questions 14 and 16 were omitted from the flood article question, as they also did not contribute to overall reliability. This reliability is a summed score and was applied to the t-tests run throughout the study.

Threats to internal validity may have existed in the posttest considering participation in the study was voluntary. Thus, those responding to the posttest may have felt strongly about the topic of agriculture and present somewhat skewed answers. Consequently, external validity might have been threatened by the pre-posttest design as the participants may have been sensitized to the treatment (posttest) they knew what to expect after taking the pretest. Therefore, we can only generalize the results of this study to the sample at hand.

Data Collection

The research instrument was administered through Qualtrics.com. Design guidelines for web-based surveys were followed using Dillman's tailored design method (2007).

Students were sent a link to the online survey through their Texas A&M University email account. A pre-notice email was sent to those enrolled in each course followed by the initial survey and the follow-up survey. Each email outlined the time parameters associated with each respective survey. In order to maintain confidentiality, surveys were number coded. Students were then able to complete the survey at the

computer of their choice. Each survey took no more than 20 minutes to complete.

Data Analysis

Statistical data analysis was performed using SPSS 20. Frequencies, percentages, means, and standard deviations were used to analyze the data from both surveys.

An independent sample t-test was used to analyze the data in the first survey to determine differences in students' perceptions of the articles when comparing photo and no photo groups. The resulting data was based upon the first eleven questions associated with the drought and flood article. These questions pertained to their perceptions of the article.

A Pearson correlation was used to analyze the pretest to determine if relationships existed between students' perceptions of news stories and their content when accompanied by photos. Only the pretest that was presented with photographs was analyzed. The resulting data was based upon the questions associated with the drought and flood article pertaining to their perceptions of the photographs in each article.

Additionally, in order to determine if significant differences existed in students' perceptions of print news story photographs when compared by self-perceived advocacy status in the milk and dairy industries an independent sample t-test was used. Self-perceived advocates' and non-advocates' answers were compared to the ten responses that were given in the pretest only.

To compare students' memory recall of print news article content when compared by photographic presence an independent t-test was used on the follow-up survey. The resulting data was based upon the posttest questions associated with the

drought and flood article. These questions pertained to their recall of each article's content.

In order to see if significant differences existed in students' perceptions of print news articles' content when compared by selected demographics an ANOVA test was used. Hometown size, family involvement in agriculture, membership to an agricultural association, current residence on a farm or ranch, and involvement in 4-H and FFA in high school were collected from the pretest.

Finally, a paired sample t-test was used to determine if significant differences existed in students' perceptions of print news articles' content when the pretest and posttest were compared. These answers were collected from both the pre and posttests in the milk article.

All answers include in the research instrument were assumed to be honest and reliable. A significance level of .05 was set with a confidence level of 95%.

CHAPTER II
EFFECTS OF PHOTOGRAPHIC INCLUSION IN PRINT NEWS ARTICLES
PERTAINING TO AGRICULTURAL ISSUES

Overview

In today's technological environment, there is constant competition for audience readership and viewership between various media outlets. News media provides a great deal of information to the general public through television, print, and web sources. More specifically, these sources are known to direct public thought in the scientific field of agriculture. Such a scientific industry presents many challenges when communicating issues, because the industry often deals with highly complex topics and copious amounts of scientific information. Since photos are understood to enhance viewer emotion toward the subject of a photograph (Rosser, 1998) and enhance comprehension (Brown, 1987), images and text are almost always inseparable. Therefore, it is pertinent to coordinate the information within an image to content within text (Zillmann, Knobloch, & Yu, 2009).

Research shows the limited treatment of agricultural issues in popular press (Whaley & Doerfert, 2003). Therefore, it is essential to have accurate portrayals of agriculture in the popular press, because, negative stereotypes are often the result of inaccurate photographs (Rhoades & Irani, 2008).

The design and use of images has long been examined in academia because of changes in the visual presentations of media outlets. Throughout history, colored images, television, and the Internet have transformed how communicators disseminate information. More specifically, the front pages of newspapers became more eye-catching

after the implementation of television in our culture in order to retain interest (Cooke, 2005).

In the 1970s and 1980s, newspapers changed their layouts to compete with television sources that provided “rapid-fire” information. Newspapers, which are not based upon quick message delivery, battled this new form of rapid communication by adding striking images to news stories. Information that was closely related was grouped together with images in order to entice readers. Photos were also the primary graphic element to appear in news stories (Cooke, 2005).

This study aimed to discover audience perceptions of two different natural disasters. Newspaper articles about the effects of the 2010-2011 drought in Texas and the aftermath of Hurricane Irene were used. Additionally, a recent drought has affected the Texas economy, the Texas cattle industry, and agriculture as a whole. During the “Towards a Compendium on National Drought Policy” meeting held in Washington, DC, the drought situation and policy all over the world was overviewed in the proceedings (Sivakumar, Motha, Wilhite, & Qu, 2011). It was decided that:

given the current concerns with climate change, projected increases in the frequency, intensity, and duration of droughts and resulting impacts on many sectors, in particular food, water, and energy, there is cause for concern regarding the lack of drought preparedness and appropriate drought management policies for virtually all nations. (Sivakumar, Motha, Wilhite, & Qu, 2011, pp. 9).

More specifically, from September 2009 to July 2010 Texas experienced a great deal of rainfall. However, in August 2010, aside from a few isolated showers, the state remained completely dry. During this period, most of Texas faced the 4th driest period on record. Texas A&M's AgriLife Extension Service estimated that this drought is likely to be the costliest in a 12-month span. In May 2011, AgriLife reported losses statewide at \$1.2 billion. The cost of the current drought may be even twice that of the previous most-costly drought, which cost \$4.1 billion in 2006 (Sivakumar, Motha, Wilhite, & Qu, 2011).

Additionally, Tropical storm Irene caused catastrophic effects on the farmers of New York and their crop. New York Governor set aside a \$15 million dollar agricultural recovery fund to help supplement the almost 100 percent lost crop (WBNG, 2011).

Therefore, it is imperative to evaluate popular press images that are paired with news stories especially in agriculture. Magazines and newspapers utilize images to help layouts appear lively and aesthetically pleasing and there is ample research on text recall with image accompaniment, (Gibson & Zillmann, 2000) but limited information is found about issue perception as a result of image accompaniment (Zillmann, 1999).

Literature Review

Visual Effects of Photographs

Most conclusions drawn from images in American print publications are based on American culture (Norwood-Tolbert & Rutherford, 2009) and the personal experience of each individual (Anderson, Dewhirst, & Ling, 2006). These conclusions often define the individual making them, (Anderson, Dewhirst, & Ling, 2006; Brandth, 1999) which makes it increasingly important to understand the overall perceptions of images in American culture. Understanding perceptions is equally important so researchers can better understand how to communicate agricultural issues to the public (Rhoades & Irani, 2008) because not only are audiences viewing images but looking to them to define and shape their views and opinions.

In general, mass communication research often lends itself to the study of the effect of individuals and the ways in which they learn and process information (Mendelson, 2004). It has been proven that photos are one of the first elements seen in a newspaper and often noticed when the accompanied article is not read (Rodgers & Thorson, 2000). Photos in newspapers are also looked at more closely than the story and captions associated with them (Mendelson, 2004) and these photos are also often utilized in news reports to illustrate a point or points made in an article (Gibson & Zillmann, 2000).

Gibson and Zillmann (2000) found that those who read balanced news reports paired with photographs that depict one side of the story, have distorted perceptions of the issue being reported on. This conclusion proves to be the fundamental research of

this study. Prior, Zillmann, Gibson, and Sargent (1999) discovered when images are paired with images that represent both sides of an issue the perceptions are not distorted by readers. Therefore it is safe to presume that the content of news photos is as important as the stories themselves (Rodgers & Thorson, 2000) since they are relied upon to make long and short-term impressions (Zillmann, Knobloch, & Yu, 2009). This effect also becomes a difficult force to battle because people have difficulty distinguishing actual events from what they perceive through photographs (Henkel, 2011).

When this information is put into consideration it is probable to assume that the careless use of photographs can lead to misconceptions about various issues (Zillmann, Knobloch, & Yu, 2009). Since journalists often consider page design rather than the impact of photographs in their newspapers, photographers, reporters, and editors must “be cognizant of the fact that their choices of photographs may have considerable impact on how readers will view the issue address in print news” (Zillmann, Gibson & Sargent, 1999, pp. 225). Additionally, since readers may take cues from visual information that the news gatekeepers did not intend to invoke, thus altering the perceptions of readers unintentionally (Gibson & Zillmann, 2000).

Henkel (2011) solidified that the effects of photos can shape people’s memories and experiences. The study also reveals that people make inferences from “photo-boostered stories” whether the photo accurately depicted the story and proved people tend to abandon their memories and previous conceived notions about issues when photos were present, and were often most confident their memories and thoughts were true when a photo was present, even if the photo depicted something otherwise. This effect is

attributed to the fact that photos are seen as “recordings of what happened” and the sheer existence of a photograph acts as evidence that the event photographed occurred as shown (Henkel, 2011).

David and Kang (1998) found that since “vivid and highly captivating pictures are memorable, high-imagery copy too can have significant effects on memory” that there is significant gain in recall with the addition of photographs and verbal imagery language in students. Pre-teenage children and their recall of advertising products also increased with more vivid and audience appealing graphics (Gunter, Baluch, Duffy, & Furnham, 2002). In terms of news articles, it was found that photographs have the ability to enhance the news media’s effect on readers (Gibson & Zillmann, 2000).

Images in Advertising

The feelings and connotations conjured within various audiences can be easily identified when looking at semiotic analysis of various advertising campaigns. Although this study focuses on news articles, advertisers also intentionally choose specific photographs to generate responses from target audiences (Henkel, 2011). This is because in brand-sensitive cultures, like that of the United States, when an individual consumes a certain product, he or she also engages in an act of social distinction (Anderson, Dewhirst, & Ling, 2006). In order to examine social distinction, an investigation of brands that are traditionally associated with cultural meanings because of the use of various symbols and product advertising often occurs (Anderson, Dewhirst, & Ling, 2006).

Because the art of interpreting messages within images, is an active process, (Norwood-Tolbert & Rutherford, 2006) various conclusions can be established from one image (Anderson, Dewhirst, & Ling, 2006). This is especially important to recognize when looking at semiotics within images because it gives insight to relationships between textual elements and photographs—especially in disciplines that require an awareness of various cultures. This is also known as social identity and is examined in a study of tobacco advertisements (Anderson, Dewhirst, & Ling, 2006). Research found in the American market, Marlboro brand cigarettes were reported to symbolize rugged, masculine, independent, and heroic characters, while the Virginia Slim brand has traditionally displayed women’s liberation, femininity, and glamour. These brands have customarily engaged in these cultural meanings through the use of symbols and appropriately themed product advertising in order to target their intended audiences (Anderson, Dewhirst, & Ling, 2006).

This is significant because the tobacco advertisement study further solidified the thought that images create and solidify a brand and a meaning associated with that brand in American culture. It was imperative to discover that “understanding what message channels and content are most effective for the tobacco industry can guide policymakers in devising both adequately responsive and knowledgeably proactive measures for minimizing the tobacco industry’s marketing effectiveness” (Anderson, Dewhirst, & Ling, 2006, pp. 260).

Images in Agricultural Advertising

A look at a semiotic case study on a Tractor Supply Company advertising campaign by Rhoades and Irani (2008) gives further insight to the manner in which the public views photographs. The purpose of this study was to discover how simplistic images in the advertisements played into common agricultural stereotypes. The stereotypes discovered included a male-dominated industry, loyal wives, a rural work ethic, and patriotism (Rhoades & Irani, 2008).

In this advertising campaign, photos of rural life were used in print advertisements. Photos from publications like America's Horse and Western Horseman were ascertained and dissected to identify the individual signs. Then the signs were explored to discover what they signify when standing alone and in relation to other signs and text in each advertisement. Finally, the connotative and denotative symbols were analyzed, followed by an entire analysis of the ideology that was being viewed by each possible consumer (Rhoades & Irani, 2008).

The photographic technique ads were found to connect potential consumers to the Tractor Supply Company by making them look like a snapshot from a passerby's camera. These photos make it apparent that their purpose was to demonstrate the ideology of what rural life looks like. Simplistic images such as pitchforks and hardworking men, paired with patriotic colors, romanticize the ideal of agriculturists working in a serene environment. Overall, the analysis of these advertisements generated a better understanding of how this campaign portrayed a rural (Rhoades & Irani, 2008). However, the stereotypes of farmers presented in these advertisements were found to be

both negative and positive. Therefore, it was concluded that agricultural communicators must continue to study how rural environments are portrayed in mass media (Rhoades & Irani, 2008).

In keeping with the idea of cultural understanding of mass media images, Brandth (1995) analyzed tractor advertisements in the same manner. It was found that tractor advertisements show masculine images of tractor advertisements to validate men in their masculine identities. This is all despite the fact that the advertisements boast new technologies that are easy to use by men and women. However, after examining several tractor advertisements, the study found the advertisements still showed symbolic masculine images in farming and large machinery and interpreted men as the primary decision makers in regards to investments in farm machinery. These conclusions reached, further validate that images and ideals relating to agriculture are highly variable to individuals and their cultural perceptions (Brandth, 1995).

These campaign analyses are crucial to the understanding of all photos in advertisements due to the fact that advertisers often do not intentionally set out to portray a product in a certain light. However, the meanings hidden within these images can still have an effect on the individuals viewing them (Bandura, 1986; Irani & Rhoades, 2008).

Images in News Articles

After examining how, in general, images in advertisements shape our cultural views, it is vital to examine the manner in which audiences view news articles associated with images (Zillman, Knobloch, & Yu, 2009). Readers differ in how they respond to the same textual elements, which may indicate varying personal and cultural histories (Anderson, Dewhirst, & Ling, 2006) such as their knowledge of the agriculture industry, (Rhoades & Irani, 2008) or simply how much time they spend reading an article that is associated with a photograph (Zillmann, Knobloch, & Yu, 2009).

Since it is known that photographs are imperative to forming short and long-term viewer impressions (Zillmann, 1999). Zillmann, et al. (2009) delved further into the subject by examining length of time articles were read by participants in order to determine if compelling images conjured more curiosity about the subject matter than the news articles that weren't accompanied with compelling images. The study asked respondents to view twelve news articles relevant to the public. They were not given a timeline or instructions regarding how long or in which order to read the articles. The results revealed that articles accompanied by photos were read and assessed for a longer period of time. Additionally, the more compelling photographs yielded an even greater amount of viewing time from readers (Zillmann, 2009).

This persuading effect can also be seen when examining a semiotic analysis of Hilary Clinton and Barack Obama images in a 2008 Time article during the democratic primary elections (Goodnow, 2010). The article titled "The Great Divide" showed four pictures of each candidate. The photos of Clinton were in black and white and showed

her reviewing papers and doing office duties. The photos of Obama were in color and showed him playing with his children and reviewing papers with his wife. The study found that the Obama photos were easily identified as family photographs while Clinton's photos were reminiscent of hard line news articles (Goodnow, 2010).

Although this study did not try to state that the article influenced the outcome of the election, it does state that it was crucial to solidifying and contributing to the overall public perception of each of these candidates (Goodnow, 2010). This example further solidifies the importance of proper and accurate photos in the news because the popular press has great influence on public opinion (Zillmann, Knobloch, & Yu, 2009).

Photos in Agricultural News Articles

When researching agricultural issues, "it is essential to take inventory of what images are portraying and saying about rural culture and ideologies" (Rhodes & Irani, 2008, "Conclusions," para. 5) since stereotypes are being formed and reinforced through visual content and symbols (Norwood-Tolbert & Rutherford, 2006).

As previous agricultural-related articles displayed, often misconceptions are held about various topics (Rhoades & Irani, 2008). This can also begin to affect the identity and overall conclusions Americans make about certain topics (Stokowski, 2011). To understand these various perspectives on agriculture, it is beneficial to look at a study of semiotics in biotechnology and food safety in popular American news magazines. This study evaluated 45 related photographs in *Time*, *Newsweek*, and *U.S. News & World Report* (Norwood-Tolbert & Rutherford, 2009).

Because American culture plays a huge role in the perceptions of photographs and linguistic signs, all the photos in the study were coded based upon American culture. This is because to read words or view a photograph, the viewer must be familiar with the culture at hand. The photos were categorized into food, animals, industry workers, animals with scientists, producers, and foreign subjects (Norwood-Tolbert & Rutherford 2009).

The 45 photos were all found to fit the semiotic categories listed above. *Newsweek* was found to have the most negative photographs relating to agriculture, while *U.S News World Report* and *Time* had more positive connotations in their photos. The overall balanced coverage was found to be of value to the news industry (Norwood-Tolbert & Rutherford, 2009).

This study concluded that it is imperative that agricultural communicators and others in the industry become proficient in producing magazine-quality photos, so an accurate portrayal of agriculture is put forth into popular media. These findings increased the attention of media literacy importance and the need for photographers from these national newspapers to understand the subjects they are photographing when in the field (Norwood-Tolbert & Rutherford, 2009).

Thus, an understanding of various audiences' cultural cues, and issue perceptions is necessary in advertising as well as journalism to reveal the appropriate messages. This concept also translates into agriculture. As Rhodes and Irani (2008) noted, "it is imperative as communicators that we continue to study how rural cultures are portrayed in the media" (Rhodes & Irani, 2008, "Conclusions," para. 5).

Perceptions of Agriculture

More specifically to the agricultural industry, some of the most controversial issues that are debated in our country often involved agriculture issues (Robert & Lawver, 1995).

According to Frick, Birkenholz, Gardener, and Machtmes (1995a), people of all ages and ethnic groups understand the importance of agriculture but have limited knowledge about agriculture and food production. Many would agree with the need for a basic understanding of agriculture, the agricultural industry, and its importance to our wellbeing (Holz & Jost, 1995; Frick, Birkenholz, Gardener, & Machtmes, 1995a; Norwood-Tolbert & Rutherford, 2009).

Nonetheless it is important for “consumers as well as policy makers to be ‘agriculturally literate’ in order to respond appropriately as issues arise” (Frick, Birkenholz, Gardener, & Machtmes, 1995a pp. 1).

One study involving focus groups with Iowa middle school students found:

“Youth equated agriculture with farming, but made no connection to the technical or research-intensive aspects of agriculture. For example, farming was perceived to be hard, physical labor and stressful because of machinery breakage, weather uncertainties, and price variances.

However, genetics, research, engineering, financial management, or international commodity markets were not mentioned by the youth” (Holz-Clause & Jost, 1995, “Findings,” para. 1).

Restated, the same students tended to understand that farmers were an important part of rural and urban society but did not have an interest in an agriculture career due to the fact that they only equated agriculture with farming rather than other aspects of the industry (Holz-Clause & Jost, 1995).

Furthermore, perceptions of agriculture tend to identify with the common and dominate ideologies of what rural life looks like, (Norwood & Rutherford, 2009) for example, youth equated farmers with other general stereotypes such as overalls, chewing on straw (Holz-Clause & Jost, 1995), plaid shirts, and pitchforks (Smith, Park, & Sutton, 2009).

Moreover, research reveals that the urbanization of the population of the United States has contributed to inaccurate perceptions and low awareness of the agriculture industry (Robert & Lawver, 1995). An example of this is a study on urban high school students near Cornell University. Those surveyed did not feel that farmers made a lot of money, and were unaware of the important agriculture commodities leaving the state of New York. Conversely, those who lived on farms or in more rural areas had more positive and accurate perceptions of agriculture. Urban students also were not considered agriculturally literate despite the fact that New York's land grant school was close to the surveyed high schools (Smith, Park, & Sutton, 2009). A study on rural students involving eleventh grade students also found that although students that were studying agriculture in high school have a greater knowledge of agriculture, a weak positive relationship existed between knowledge of agriculture and perception of agriculture scores (Wright, Stewart, & Birkenholz, 1994).

In a 1995 study university students gave insight to views on agriculture. It was found that they perceived America's food supply to be safe and said agriculture positively impacts our economy. In terms of college major, students from the law and education schools had the same perceptions as college of agriculture students. However, students from other colleges differed from the college of agriculture students on one or more factors (Robert & Lawver, 1995). Furthermore, agricultural communications students, Agriculture Communicators of Tomorrow and those enrolled in agricultural communications courses at 11 universities were found to have more positive perceptions of agriculture if their families owned agricultural property, or had lived on a farm or ranch (Wingenbach, Rutherford, & Dunsford, 2003).

In terms of agricultural organizations, 4-H and FFA are also represented in previous studies of agricultural perceptions. Frick, Birkenholz, & Machtmes (1995b) found in a study involving Midwestern 4-H members that 4-H members understood agriculture most in the areas of natural resources and marketing of products and the lowest in terms of plant production. 4-H members from farms of ten to fifty acres and were enrolled in a high school agriculture program produced positive perceptions of agriculture while those who were not enrolled in a high school agriculture program produced less positive perceptions of agriculture (Frick, Birkenholz & Machtmes, 1995b).

Purpose of Study

The purpose of this study was to examine the effects of photographic inclusion in print news articles in agriculture. The objectives were to:

Objectives

- (a) Determine if a significant difference existed in students' perceptions of print news story when compared by photographic presence;
- (b) Determine if a significant relationship existed between students' perceptions of news stories content and accompanying photos;
- (c) Determine if significant differences existed in students' perceptions of print news story photographs and content when compared by self-perceived advocacy status (milk consumption and dairy industry);

Methods

The descriptive study conducted aimed to explain if photographs had an effect on the perceptions of agriculture in news articles pertaining to natural disasters. A pretest-posttest design was used to compare treatment groups with the treatment being photographs. However, this study examines effects of photographs in the pretest only. During the initial experimental session, respondents were asked to read three news reports. One involved a poorly executed California milk campaign, which acted as the control of the study in order to maintain a baseline of data. The other two articles addressed the cattle industry during the 2011 drought in Texas and a flood plain in New York after tropical storm Irene. The article regarding the drought in Texas interviewed cattle ranchers from other states that were benefiting from the reduced prices on Texas cattle sold. While the article about the flood plain in New York interviewed the farmers who were affected in the region after tropical storm Irene.

Half the sample received these articles with photographs while the other half received the same articles without photographs. The milk article was not altered in any way, including the images, and served as a constant. The drought in Texas and article had images manipulated while the flood article kept the original images ran in the newspaper.

All answers include in the research instrument were assumed to be honest and reliable. A significance level of .05 was set with a confidence level of 95%.

Two introductory courses at Texas A&M University were surveyed with a ten-day time period between each survey instrument. The classes included class *AGLS 101—Modern Agricultural Systems and Renewable Natural Resources* and an introductory agricultural communications course *AGCJ 105—Introduction to Agricultural Communications*.

These two courses comprised of 336 freshman, 200 sophomores, 102 juniors and 50 seniors in the population. They also majored in 43 different majors at Texas A&M University.

The two agricultural classes allowed for the analysis of the agricultural perceptions, under the assumption that these students have an understanding of agricultural issues. This further expands the study when looking at possible media bias because it is assumed these students have a basis of understanding in terms of agriculture.

The population of interest for this study was College of Agriculture and Life Sciences students at Texas A&M University in the. Based on the 2011 enrollment report

from Texas A&M, undergraduate enrollment at the university was 39,867 with 5,631 of these students enrolled as agriculture majors (Office of Institutional Studies and Planning, 2011). These two courses surveyed comprised of 336 freshman, 200 sophomores, 102 juniors and 50 seniors in the population. They also represented 43 different Texas A&M University majors.

Two course sections of *AGLS 101—Modern Agricultural Systems and Renewable Natural Resources* and one section of *AGCJ 105—Introduction to Agricultural Communications*. However, the students in the accessible population were not all agriculture majors. These students were selected because they were assumed to have some interest and base of knowledge about agriculture regardless of major. *AGLS 101* had 581 students enrolled while *AGCJ* has 104 students enrolled. A total of 676 surveys were distributed to all enrolled in these two courses.

The same demographic questions were presented to the entire sample. A response rate of 42% (290 students) was reported for the initial survey. 92 respondents received news reports with no accompanying photographs while 198 students received news reports with photographs. Each student had an equal and independent chance of being assigned to each group.

A response rate of 59% (155 students) also responded to the second follow-up survey. An interval of 10 days separated the pretest and the posttest.

The research instrument consisted of a both pre and post surveys to measure student perceptions of images used in two agricultural-related news articles. This study was approved by the Institutional Review Board (IRB#2011-0879).

Both surveys utilized a five-point Likert-type scale. These were worded so the students' reactions to them were reflective of both positive and negative statements. Students then responded as to whether they *strongly disagreed, disagreed, agreed or strongly agreed* to the statements. This strategy was based upon Measurement of Communication Behavior book (1989) and the attitude measurement methods described in the book. (Barker & Emmert, 1989).

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Additionally, the third article, “*Upstate farmers find that a fertile flood plain is a two-edged sword*,” also contained twenty statements about their perceptions of the article as well as the images associated with the article. This article was also obtained from the *New York Times* and was released on August 30, 2011. This article was chosen because of the relevance it holds to the flood situation in New York. It interviewed farmers in New York who had suffered personal loss from the tropical storm and personal accounts of their declining business were recorded.

Ten days following the initial survey, a follow-up instrument was sent to the respondents to the initial survey. While the first article, “*Milk Campaign Ended Amid Social Media Firestorm*” remained constant; the other two articles were presented, with all photos removed, and included eleven statements about their long-term perceptions and recall of the articles’ content using a 5-point Likert-type scale.

Students’ demographic information pertaining to their agricultural background was also collected with both survey instruments. These questions included if their family is involved in agriculture and the type (production, retail, or processing) if their family is involved in agriculture, agricultural associations, if they live on an active farm or ranch, and the size of their hometown (rural, suburban, or urban). They were also asked if they were involved in 4-H and FFA in high school.

Article perceptions of the drought and flood articles (questions 1-11) in the pretest were summated to produce a Cronbach’s alpha of .75 and .71, respectively. Questions 3 and 4 were omitted from both article questions, as they did not contribute to overall reliability. Furthermore, photo perceptions of the drought and flood articles

(questions 12-20) in the pretest were also summated to produce a Cronbach's alpha of .84 and .72, respectively. Questions 14 and 15 were reverse coded in the drought article in order to accurately depict student answers. Questions 14 and 16 were omitted from the flood article question, as they did not contribute to overall reliability. This reliability is a summed score and was applied to the t-tests run throughout the study.

The research instrument was administered through Qualtrics.com. Design guidelines for web-based surveys were followed using Dillman's tailored design method (2007).

Students were sent a link to the online survey through their Texas A&M University email account. A pre-notice email was sent to those enrolled in each course followed by the initial survey and the follow-up survey. Each email outlined the time parameters associated with each respective survey. In order to maintain confidentiality, surveys were number coded. Students were then able to complete the survey at the computer of their choice. Each survey took no more than 20 minutes to complete.

Data Analysis

Statistical data analysis was performed using SPSS 20. Frequencies, percentages, means, and standard deviations were used to analyze the data from both surveys.

An independent sample t-test was used to analyze the data in the first survey to determine differences in students' perceptions of the articles when comparing photo and no photo groups. The resulting data was based upon the first eleven questions associated with the drought and flood article. These questions pertained to their perceptions of the article.

A Pearson correlation was used to analyze the pretest to determine if relationships existed between students' perceptions of news stories and their content when accompanied by photos. Only the pretest that was presented with photographs was analyzed. The resulting data was based upon the questions associated with the drought and flood article pertaining to their perceptions of the photographs in each article.

Additionally, in order to determine if significant differences existed in students' perceptions of print news story photographs when compared by self-perceived advocacy status in the milk and dairy industries an independent sample t-test was used. Self-perceived advocates' and non-advocates' answers were compared to the ten responses that were given in the pretest only.

Results

Respondents indicated if they were involved in various agricultural associations. Texas A&M's Saddle and Sirloin (n=7) club and Agricultural Communicators of Tomorrow (n=4) were listed. Also several livestock breed associations were identified. Students also responded if they were involved in 4-H (29.3%) and/or FFA (41.0%) in high school.

Respondents also identified family involvement in agriculture: production (26.2%), retail (11.7%), and processing (2.8%). Respondents also identified if their family worked in agriculture (41.4%) or if they had grown up on a farm ranch (26.6%). Furthermore, students who responded currently live on an active farm or ranch (26.6%). Additionally, 40.3% of respondents reported they grew up in a rural town, followed by suburban 28.6% and urban 26.9%.

Table 1 represents the individual scales' descriptive statistics used to compare the photographs to the drought story content, Table 2 represents descriptive statistics used to compare the photographs to the story content in the flood article and Table 3 represents the summated descriptive statistics for each.

Table 1

Descriptive Statistics of Individual Photograph Questions for the Article "As Ranchers in Drought-stricken Southwest Sell Cattle, Some Northern States See Chance to Grow."

Drought	M ¹	SD
These photographs accurately depict the drought.	1.93	.752
These photographs accurately depict agriculture's current situation.	2.11	.693
These photographs associated with this article portray agriculture positively.	2.98	.568
These photographs associated with this article portray agriculture negatively.	2.01	.604
The photographs associated with this article are positive.	2.99	.524
The photographs associated with this article are negative.	1.98	.568
The photographs associated with this story are valid.	2.51	.680
The photographs associated with this story are accurate.	2.41	.713
These photographs influence my perception of the article.	2.18	.697

Note. ¹ Likert-type scale: 1 = Strongly Disagree, 2 = Disagree 3 = Agree 4 = Strongly Agree

Table 2

Descriptive Statistics of Individual Photograph Questions for the Article “Upstate Farmers Find that A Fertile Flood Plain Is A Two-Edged Sword.”

Flood	M ¹	SD
These photographs accurately depict the flood.	2.87	.63
These photographs accurately depict agriculture's current situation.	2.59	.66
These photographs associated with this article portray agriculture positively.	2.56	.60
These photographs associated with this article portray agriculture negatively.	2.78	.58
The photographs associated with this article are positive.	2.98	.51
The photographs associated with this article are negative.	2.93	.54
The photographs associated with this story are valid.	2.63	.70

Note. ¹ Likert-type scale: 1 = Strongly Disagree, 2 = Disagree 3 = Agree 4 = Strongly Agree

Table 3

Descriptive Statistics of Article Content and Photograph Questions for the Drought and Flood Articles.

Perceptions	Story Type	M ¹	SD	N
Story Content	Drought	27.74	3.20	286
	Flood	25.46	3.21	282
Story Photos	Drought	18.98	3.93	197
	Flood	19.24	2.68	191

Note. ¹ 9 questions were summed to generate means representing respondents' perceptions of print news stories and could have ranged from 9 to 36.

All data represents information based on the pretest. In answering the first objective, the data showed that on average, no significant differences were found with students' who received photographs and those who did not, in terms of their perceptions of the drought and flood news stories based on the summated constructs from the first eleven questions of both the drought and flood articles.

As represented in Table 4, students had positive perceptions of each article when compared by photographic presence in the drought article with those who did not receive photos ($M= 27.64$, $SD= 3.40$) and those who did ($M=27.97$, $SD=3.11$). Similar results

were found in the flood article with students who did not receive photos ($M=25.21$, $SD=3.11$) and those who did ($M=25.57$, $SD=3.24$). This difference was not significant difference in the drought article ($t= 0.79$, $p > .05$) or the flood article ($t= -0.88$, $p > .05$.)

Table 4

Student Perceptions of Print News Stories When Compared by Photo and No Photo Subgroups.

Print News Stories	Groups	<i>n</i>	<i>M</i> ¹	<i>SD</i>	<i>t</i>	Sig.
Drought	No Photo	90	27.97	3.40	0.79	0.43
	Photo	196	27.64	3.11		
Flood	No Photo	90	25.21	3.14	-0.88	0.38
	Photo	192	25.57	3.24		

Note. ¹ 9 questions were summed to generate means representing respondents' perceptions of print news stories and could have ranged from 9 to 36.

When comparing the relationships existing between students' perceptions of news story content and accompanying photos in both the drought and flood articles, there was a significant relationship between the photos and article content in the flood article, ($r= .42$, $p < .05$). However, as seen in Table 5, the photos associated with the drought article, did not have a significant relationship.

Table 5

Relationship Between Story Content and Photographs for Drought and Flood Articles.

News Story Content	News Story Photos			
	Drought		Flood	
	<i>r</i>	Sig.	<i>r</i>	Sig.
Drought	-.12	(.10)		
Flood			.42*	(.00)

*. Correlation is significant at the 0.05 level (2-tailed).

Furthermore, this study aimed to determine if student's who were self-perceived advocates in terms of milk consumption and the dairy industry had different perceptions of the milk article news story content and its photographs.

There was no significant relationship between those students who claimed to be milk consumption advocates and those who did not when compared by most of the following constructs. However, as seen in Table 6, one significant relationship did exist between self-perceived advocates and non-advocates when asked if the source of this article influenced their perception of the issue, ($t(287) = -2.44, p > .05$), as those who considered themselves advocates felt less influenced by the source of the article ($M=2.34$) than those who did not ($M= 2.10$).

Table 6

Student Perceptions of Milk Article News Story When Compared by Milk Consumption Self-Perceived Advocacy and Non-Advocacy.

Statements	Milk Consumption ²	<i>n</i>	<i>M</i> ¹	<i>SD</i>	<i>t</i>	Sig
The photographs associated with this article are negative.	Non-Advocate	51	2.22	.78	-1.62	.11
	Advocate	237	2.40	.71		
The photographs associated with this article are positive.	Non-Advocate	51	2.31	.79	-.15	.88
	Advocate	237	2.33	.64		
The photographs associated with this article are humorous.	Non-Advocate	51	3.12	.86	-.73	.46
	Advocate	237	3.20	.68		
The photographs associated with this article are offensive to women.	Non-Advocate	51	2.22	.94	-1.39	.16
	Advocate	237	2.38	.72		
The photographs influenced my perception of the article.	Non-Advocate	51	2.39	.85	-1.05	.29
	Advocate	235	2.51	.70		
These photographs are shocking to me.	Non-Advocate	50	1.72	.61	-.35	.73
	Advocate	236	1.75	.64		
Ending the campaign was a good marketing decision.	Non-Advocate	51	2.75	.80	-.54	.59
	Advocate	237	2.80	.66		
The backlash generated by the advertising campaign was warranted.	Non-Advocate	51	2.39	.75	-1.09	.28
	Advocate	236	2.50	.65		

Table 6 (cont.)

Statements	Milk Consumption ²	<i>n</i>	<i>M</i> ¹	<i>SD</i>	<i>t</i>	Sig
The gotdiscussion.com site should have replaced the everythingidoiswrong.org site.	Non-Advocate	51	2.41	.75	-.95	.35
	Advocate	237	2.50	.59		
The source of this article influenced my perception of the issue.	Non-Advocate	51	2.10	.64	-2.44	.02*
	Advocate	237	2.34	.65		

Note. ¹ Likert-type scale: 1 = Strongly Disagree, 2 = Disagree 3 = Agree 4 = Strongly Agree

² Non-advocates = 1, strongly disagree and 2, disagree and Advocates = 3, agree and 4, strongly agree

Additionally, Table 7 shows no significant relationship between those students who claimed to be dairy farmer advocates and those who did not when compared by the following constructs. However, self-perceived advocates were observed to see the source of the article as less influential ($M = 2.34$) than those who did not consider themselves advocates ($M = 2.14$) since one significant relationship did exist when asked if the source of this article influenced their perception of the issue, ($t(286) = -2.17, p > .05$).

Table 7

Student Perceptions of Milk Article News Story When Compared by Dairy Farmer Self-Perceived Advocacy and Non-Advocacy.

Statements	Dairy Farmers ²	<i>n</i>	<i>M</i> ¹	<i>SD</i>	<i>t</i>	Sig
The photographs associated with this article are negative.	Non-Advocate	63	2.30	.75	-.80	.43
	Advocate	224	2.38	.72		
The photographs associated with this article are positive.	Non-Advocate	63	2.22	.73	-1.38	.17
	Advocate	224	2.35	.65		
The photographs associated with this article are humorous.	Non-Advocate	63	3.03	.84	-1.90	.06
	Advocate	224	3.22	.67		
The photographs associated with this article are offensive to women.	Non-Advocate	63	2.35	.90	-.03	.97
	Advocate	224	2.35	.72		
The photographs influenced my perception of the article.	Non-Advocate	63	2.40	.77	-1.12	.26
	Advocate	222	2.51	.72		
These photographs are shocking to me.	Non-Advocate	62	1.79	.63	.56	.58
	Advocate	223	1.74	.63		
Ending the campaign was a good marketing decision.	Non-Advocate	63	2.70	.75	-1.27	.21
	Advocate	224	2.82	.66		
The backlash generated by the advertising campaign was warranted.	Non-Advocate	63	2.40	.68	-1.20	.23
	Advocate	223	2.51	.66		

Table 7 (cont.)

Statements	Dairy Farmers ²	<i>n</i>	<i>M</i> ¹	<i>SD</i>	<i>t</i>	Sig
The gotdiscussion.com site should have replaced the everythingidoiswrong.org site.	Non-Advocate	63	2.46	.67	-2.17	.03*
	Advocate	224	2.50	.61		
The source of this article influenced my perception of the issue.	Non-Advocate	63	2.14	.64	-2.17	.03*
	Advocate	224	2.34	.65		

Note. ¹ Likert-type scale: 1 = Strongly Disagree, 2 = Disagree 3 = Agree 4 = Strongly Agree

² Non-advocates = 1, strongly disagree and 2, disagree and Advocates = 3, agree and 4, strongly agree

Conclusions and Recommendations

This study found student perceptions of the two news articles related to the 2011 Texas drought as well as the aftermath of tropical storm Irene to be the same regardless if they received photographs or not. This would lead the researcher to conclude that the photos had no effect on the overall perceptions of the news stories. Another possibility of the story content being overwhelming in comparison to the treatment of photographs and no photographs also exists. These findings may negate previously stated research in regards to photographic effects of news stories.

However, students who received photographs did see a relationship between the photos associated with the flood article and the content presented in the story. This effect was not seen with the photographs of the drought story. Since the photos associated with the flood story were the original photos printed with the news story, it is probable to conclude that students properly associated photographic elements with that of the story's content. Photos presented in the survey with the drought article, showed blue skies, green grasses, and cattle eating. No correlations were seen between these two elements. This non-relationship is equally as powerful due to the fact that the story, although spun positively in favor of out of state cattle ranchers, did not in fact depict what was occurring in Texas during the drought. Therefore, it can be concluded that although students were not swayed by photographic effects as found in objective one, were cognizant of the situation occurring in Texas and were able to identify that the photographs were not accurately depicting the situation in Texas.

While both groups disagreed that they were influenced by the source of the article, non-advocates ($M=2.10$) more strongly disagreed with the statement than advocates ($M=2.34$). This gives insight to students' perceptions of the media outlet that ran the milk campaign news story. Since there was a difference seen between self-perceived advocates and non-advocates in terms of the source of the news article, it also might be probable to presume that student's who considered themselves advocates were more informed which may lead them to acknowledge the source less. It also may also be fair to conclude that the students recognized the news article was released by a national accredited newspaper rather than an agricultural group and might not see the New York Times as a source that would significantly sway their preconceived opinions of the dairy industry and milk consumption. These findings may also indicate that based on self-perceived advocacy status, the images had no effect but rather the *topic* of the article influenced perceptions based on students' preconceived notions.

Since photographic effects are historically seen to enhance photographs and define individual decisions on various issues (Anderson, Dewhirst, & Ling, 2006; Brandth, 1999), it is fair to assume the concept of a cognitive springboard exists in agriculture related issues (Henkel, 2011). This conclusion is based on the majority of students surveyed presumably had some sort of agricultural background or interest had some preconceived notions relating to the drought in Texas. They may have been based on their personal experiences or agricultural backgrounds. However, the fact that no relationship was seen between the somewhat positive photographs presented with the

article relating to the Texas drought and the article content, although spun positively, solidifies previous research relating to human processes and photographic effects.

Results of this research show that in the case of these natural disasters, there was no dramatic effect of photographs persuading readers. Students in introductory courses in the College of Agriculture at Texas A&M University were in touch because drought was a predominant media issue throughout Texas, not just in agriculture with agriculture issues offering in the state relating to the 2010-2011 Texas drought. They were also aware of accurate depictions of photographs in terms of tropical storm Irene coverage.

Since students did not see a relationship between the drought article photos and its content, researchers can conclude that because we surveyed Texas students they were aware of the situation through personal experience. Therefore it would also be important to examine student perceptions of this study outside of the state of Texas in order to determine if those surveyed let their surroundings impact their perceptions rather than the photographs provided.

Students who were self-perceived milk advocates also appeared to be less aware of the source of the article regarding the milk campaign. This is likely attributed to students' positive preconceived notions regarding the milk industry.

With this in mind, it remains imperative that photographs accurately depict issues in print news in order to continue to see large scale relationships between news content and news photographs. Although replicating this study utilizing students outside of an agriculture college may indicate different results, it still remains important to accurately

pair story content with photographs as to not confuse or coerce readers into false perceptions of any topic.

CHAPTER III
FACTORS AFFECTING STUDENT RECALL OF PRINT NEWS ARTICLES IN
AGRICULTURE

Overview

In today's technological environment, there is constant competition for audience readership and viewership between various media outlets. News media provides a great deal of information to the general public through television, print, and web sources. More specifically, these sources are known to direct public thought in the scientific field of agriculture. Such a scientific industry presents many challenges when communicating issues, because the industry often deals with highly complex topics and copious amounts of scientific information. Since photos are understood to enhance viewer emotion toward the subject of a photograph (Rosser, 1998) and enhance comprehension (Brown, 1987), images and text are almost always inseparable. Therefore, it is pertinent to coordinate the information within an image to content within text (Zillmann, Knobloch, & Yu, 2009).

Research shows the limited treatment of agricultural issues in popular press (Whaley & Doerfert, 2003). Therefore, it is essential to have accurate portrayals of agriculture in the popular press, because, negative stereotypes are often the result of inaccurate photographs (Rhoades & Irani, 2008).

The design and use of images has long been examined in academia because of changes in the visual presentations of media outlets. Throughout history, colored images, television, and the Internet have transformed how communicators disseminate information. More specifically, the front pages of newspapers became more eye-catching

after the implementation of television in our culture in order to retain interest (Cooke, 2005).

In the 1970s and 1980s, newspapers changed their layouts to compete with television sources that provided “rapid-fire” information. Newspapers, which are not based upon quick message delivery, battled this new form of rapid communication by adding striking images to news stories. Information that was closely related was grouped together with images in order to entice readers. Photos were also the primary graphic element to appear in news stories (Cooke, 2005).

This study aimed to discover audience perceptions of two different natural disasters. Newspaper articles about the effects of the 2010-2011 drought in Texas and the aftermath of Hurricane Irene were used. Additionally, a recent drought has affected the Texas economy, the Texas cattle industry, and agriculture as a whole. During the “Towards a Compendium on National Drought Policy” meeting held in Washington, DC, the drought situation and policy all over the world was overviewed in the proceedings (Sivakumar, Motha, Wilhite, & Qu, 2011). It was decided that:

given the current concerns with climate change, projected increases in the frequency, intensity, and duration of droughts and resulting impacts on many sectors, in particular food, water, and energy, there is cause for concern regarding the lack of drought preparedness and appropriate drought management policies for virtually all nations. (Sivakumar, Motha, Wilhite, & Qu, 2011, pp. 9).

More specifically, from September 2009 to July 2010 Texas experienced a great deal of rainfall. However, in August 2010, aside from a few isolated showers, the state remained completely dry. During this period, most of Texas faced the 4th driest period on record. Texas A&M's AgriLife Extension Service estimated that this drought is likely to be the costliest in a 12-month span. In May 2011, AgriLife reported losses statewide at \$1.2 billion. The cost of the current drought may be even twice that of the previous most-costly drought, which cost \$4.1 billion in 2006 (Sivakumar, Motha, Wilhite, & Qu, 2011).

Additionally, Tropical storm Irene caused catastrophic effects on the farmers of New York and their crop. New York Governor set aside a \$15 million dollar agricultural recovery fund to help supplement the almost 100 percent lost crop (WBNG, 2011).

Therefore, it is imperative to evaluate popular press images that are paired with news stories especially in agriculture. Magazines and newspapers utilize images to help layouts appear lively and aesthetically pleasing and there is ample research on text recall with image accompaniment, (Gibson & Zillmann, 2000) but limited information is found about issue perception as a result of image accompaniment (Zillmann, 1999).

Literature Review

Visual Effects of Photographs & Recall

Most conclusions drawn from images in American print publications are based on American culture (Norwood-Tolbert & Rutherford, 2009) and the personal experience of each individual (Anderson, Dewhirst, & Ling, 2006). These conclusions often define the individual making them, (Anderson, Dewhirst, & Ling, 2006; Brandth, 1999) which makes it increasingly important to understand the overall perceptions of images in American culture. Understanding perceptions is equally important so researchers can better understand how to communicate agricultural issues to the public (Rhoades & Irani, 2008) because not only are audiences viewing images but looking to them to define and shape their views and opinions.

In general, mass communication research often lends itself to the study of the effect of individuals and the ways in which they learn and process information (Mendelson, 2004). It has been proven that photos are one of the first elements seen in a newspaper and often noticed when the accompanied article is not read (Rodgers & Thorson, 2000). Photos in newspapers are also looked at more closely than the story and captions associated with them (Mendelson, 2004) and these photos are also often utilized in news reports to illustrate a point or points made in an article (Gibson & Zillmann, 2000).

Gibson and Zillmann (2000) found that those who read balanced news reports paired with photographs that depict one side of the story, have distorted perceptions of the issue being reported on. This conclusion proves to be the fundamental research of

this study. Prior, Zillmann, Gibson, and Sargent (1999) discovered when images are paired with images that represent both sides of an issue the perceptions are not distorted by readers. Therefore it is safe to presume that the content of news photos is as important as the stories themselves (Rodgers & Thorson, 2000) since they are relied upon to make long and short-term impressions (Zillmann, Knobloch, & Yu, 2009). This effect also becomes a difficult force to battle because people have difficulty distinguishing actual events from what they perceive through photographs (Henkel, 2011).

When this information is put into consideration it is probable to assume that the careless use of photographs can lead to misconceptions about various issues (Zillmann, Knobloch, & Yu, 2009). Since journalists often consider page design rather than the impact of photographs in their newspapers, photographers, reporters, and editors must “be cognizant of the fact that their choices of photographs may have considerable impact on how readers will view the issue address in print news” (Zillmann, Gibson & Sargent, 1999, pp. 225). Additionally, since readers may take cues from visual information that the news gatekeepers did not intend to invoke, thus altering the perceptions of readers unintentionally (Gibson & Zillmann, 2000).

Henkel (2011) solidified that the effects of photos can shape people’s memories and experiences. The study also reveals that people make inferences from “photo-boostered stories” whether the photo accurately depicted the story and proved people tend to abandon their memories and previous conceived notions about issues when photos were present, and were often most confident their memories and thoughts were true when a photo was present, even if the photo depicted something otherwise. This effect is

attributed to the fact that photos are seen as “recordings of what happened” and the sheer existence of a photograph acts as evidence that the event photographed occurred as shown (Henkel, 2011).

David and Kang (1998) found that since “vivid and highly captivating pictures are memorable, high-imagery copy too can have significant effects on memory” that there is significant gain in recall with the addition of photographs and verbal imagery language in students. Pre-teenage children and their recall of advertising products also increased with more vivid and audience appealing graphics (Gunter, Baluch, Duffy, & Furnham, 2002). Furthermore, in terms of news articles, it was found that photographs have the ability to enhance the news media’s effect on readers (Gibson & Zillmann, 2000).

Images in Advertising

The feelings and connotations conjured within various audiences can be easily identified when looking at semiotic analysis of various advertising campaigns. Although this study focuses on news articles, advertisers also intentionally choose specific photographs to generate responses from target audiences (Henkel, 2011). This is because in brand-sensitive cultures, like that of the United States, when an individual consumes a certain product, he or she also engages in an act of social distinction (Anderson, Dewhirst, & Ling, 2006). In order to examine social distinction, an investigation of brands that are traditionally associated with cultural meanings because of the use of various symbols and product advertising often occurs (Anderson, Dewhirst, & Ling, 2006).

Because the art of interpreting messages within images, is an active process, (Norwood-Tolbert & Rutherford, 2006) various conclusions can be established from one image (Anderson, Dewhirst, & Ling, 2006). This is especially important to recognize when looking at semiotics within images because it gives insight to relationships between textual elements and photographs—especially in disciplines that require an awareness of various cultures. This is also known as social identity and is examined in a study of tobacco advertisements (Anderson, Dewhirst, & Ling, 2006). Research found in the American market, Marlboro brand cigarettes were reported to symbolize rugged, masculine, independent, and heroic characters, while the Virginia Slim brand has traditionally displayed women’s liberation, femininity, and glamour. These brands have customarily engaged in these cultural meanings through the use of symbols and appropriately themed product advertising in order to target their intended audiences (Anderson, Dewhirst, & Ling, 2006).

This is significant because the tobacco advertisement study further solidified the thought that images create and solidify a brand and a meaning associated with that brand in American culture. Furthermore, it was imperative to discover that “understanding what message channels and content are most effective for the tobacco industry can guide policymakers in devising both adequately responsive and knowledgeably proactive measures for minimizing the tobacco industry’s marketing effectiveness” (Anderson, Dewhirst, & Ling, 2006, pp. 260).

Images in Agricultural Advertising

A look at a semiotic case study on a Tractor Supply Company advertising campaign by Rhoades and Irani (2008) gives further insight to the manner in which the public views photographs. The purpose of this study was to discover how simplistic images in the advertisements played into common agricultural stereotypes. The stereotypes discovered included a male-dominated industry, loyal wives, a rural work ethic, and patriotism (Rhoades & Irani, 2008).

In this advertising campaign, photos of rural life were used in print advertisements. Photos from publications like America's Horse and Western Horseman were ascertained and dissected to identify the individual signs. Then the signs were explored to discover what they signify when standing alone and in relation to other signs and text in each advertisement. Finally, the connotative and denotative symbols were analyzed, followed by an entire analysis of the ideology that was being viewed by each possible consumer (Rhoades & Irani, 2008).

The photographic technique ads were found to connect potential consumers to the Tractor Supply Company by making them look like a snapshot from a passerby's camera. These photos make it apparent that their purpose was to demonstrate the ideology of what rural life looks like. Simplistic images such as pitchforks and hardworking men, paired with patriotic colors, romanticize the ideal of agriculturists working in a serene environment. Overall, the analysis of these advertisements generated a better understanding of how this campaign portrayed a rural lifestyle (Rhoades & Irani, 2008). However, the stereotypes of farmers presented in these advertisements were

found to be both negative and positive. Therefore, it was concluded that agricultural communicators must continue to study how rural environments are portrayed in mass media (Rhoades & Irani, 2008).

In keeping with the idea of cultural understanding of mass media images, Brandth (1995) analyzed tractor advertisements in the same manner. It was found that tractor advertisements show masculine images of tractor advertisements to validate men in their masculine identities. This is all despite the fact that the advertisements boast new technologies that are easy to use by men and women. However, after examining several tractor advertisements, the study found the advertisements still showed symbolic masculine images in farming and large machinery and interpreted men as the primary decision makers in regards to investments in farm machinery. These conclusions reached, further validate that images and ideals relating to agriculture are highly variable to individuals and their cultural perceptions (Brandth, 1995).

These campaign analyses are crucial to the understanding of all photos in advertisements due to the fact that advertisers often do not intentionally set out to portray a product in a certain light. However, the meanings hidden within these images can still have an effect on the individuals viewing them (Bandura, 1986; (Rhoades & Irani, 2008).

Images in News Articles

After examining how, in general, images in advertisements shape our cultural views, it is vital to examine the manner in which audiences view news articles associated with images (Zillman, Knobloch, & Yu, 2009). Readers differ in how they respond to the same textual elements, which may indicate varying personal and cultural histories (Anderson, Dewhirst, & Ling, 2006) such as their knowledge of the agriculture industry, (Rhoades & Irani, 2008) or simply how much time they spend reading an article that is associated with a photograph (Zillmann, Knobloch, & Yu, 2009).

Since it is known that photographs are imperative to forming short and long-term viewer impressions (Zillmann, 1999). Zillmann, et al. (2009) delved further into the subject by examining length of time articles were read by participants in order to determine if compelling images conjured more curiosity about the subject matter than the news articles that weren't accompanied with compelling images. The study asked respondents to view twelve news articles relevant to the public. They were not given a timeline or instructions regarding how long or in which order to read the articles. The results revealed that articles accompanied by photos were read and assessed for a longer period of time. Additionally, the more compelling photographs yielded an even greater amount of viewing time from readers (Zillmann, 2009).

This persuading effect can also be seen when examining a semiotic analysis of Hilary Clinton and Barack Obama images in a 2008 Time article during the democratic primary elections (Goodnow, 2010). The article titled "The Great Divide" showed four pictures of each candidate. The photos of Clinton were in black and white and showed

her reviewing papers and doing office duties. The photos of Obama were in color and showed him playing with his children and reviewing papers with his wife. The study found that the Obama photos were easily identified as family photographs while Clinton's photos were reminiscent of hard line news articles (Goodnow, 2010).

Although this study did not try to state that the article influenced the outcome of the election, it does state that it was crucial to solidifying and contributing to the overall public perception of each of these candidates (Goodnow, 2010). This example further solidifies the importance of proper and accurate photos in the news because the popular press has great influence on public opinion (Zillmann, Knobloch, & Yu, 2009).

Photos in Agricultural News Articles

When researching agricultural issues, "it is essential to take inventory of what images are portraying and saying about rural culture and ideologies" (Rhodes & Irani, 2008, "Conclusions," para. 5) since stereotypes are being formed and reinforced through visual content and symbols (Norwood-Tolbert & Rutherford, 2006).

As previous agricultural-related articles displayed, often misconceptions are held about various topics (Rhoades & Irani, 2008). This can also begin to affect the identity and overall conclusions Americans make about certain topics (Stokowski, 2011). To understand these various perspectives on agriculture, it is beneficial to look at a study of semiotics in biotechnology and food safety in popular American news magazines. This study evaluated 45 related photographs in *Time*, *Newsweek*, and *U.S. News & World Report* (Norwood-Tolbert & Rutherford, 2009).

Because American culture plays a huge role in the perceptions of photographs and linguistic signs, all the photos in the study were coded based upon American culture. This is because to read words or view a photograph, the viewer must be familiar with the culture at hand. The photos were categorized into food, animals, industry workers, animals with scientists, producers, and foreign subjects (Norwood-Tolbert & Rutherford 2009).

The 45 photos were all found to fit the semiotic categories listed above. *Newsweek* was found to have the most negative photographs relating to agriculture, while *U.S News World Report* and *Time* had more positive connotations in their photos. The overall balanced coverage was found to be of value to the news industry (Norwood-Tolbert & Rutherford, 2009).

This study concluded that it is imperative that agricultural communicators and others in the industry become proficient in producing magazine-quality photos, so an accurate portrayal of agriculture is put forth into popular media. These findings increased the attention of media literacy importance and the need for photographers from these national newspapers to understand the subjects they are photographing when in the field (Norwood-Tolbert & Rutherford, 2009).

Thus, an understanding of various audiences' cultural cues, and issue perceptions is necessary in advertising as well as journalism to reveal the appropriate messages. This concept also translates into agriculture. As Rhodes and Irani (2008) noted, "it is imperative as communicators that we continue to study how rural cultures are portrayed in the media" (Rhodes & Irani, 2008, "Conclusions," para. 5).

Perceptions of Agriculture

More specifically to the agricultural industry, some of the most controversial issues that are debated in our country often involved agriculture issues (Robert & Lawver, 1995).

According to Frick, Birkenholz, Gardener, and Machtmes (1995a), people of all ages and ethnic groups understand the importance of agriculture but have limited knowledge about agriculture and food production. Many would agree with the need for a basic understanding of agriculture, the agricultural industry, and its importance to our wellbeing (Holz & Jost, 1995; (Frick, Birkenholz, Gardener, & Machtmes, 1995a; Norwood-Tolbert & Rutherford, 2009).

Nonetheless it is important for “consumers as well as policy makers to be ‘agriculturally literate’ in order to respond appropriately as issues arise” (Frick, Birkenholz, Gardener, & Machtmes, 1995a pp. 1).

One study involving focus groups with Iowa middle school students found:

“Youth equated agriculture with farming, but made no connection to the technical or research-intensive aspects of agriculture. For example, farming was perceived to be hard, physical labor and stressful because of machinery breakage, weather uncertainties, and price variances.

However, genetics, research, engineering, financial management, or international commodity markets were not mentioned by the youth” (Holz-Clause & Jost, 1995, “Findings,” para. 1).

Restated, the same students tended to understand that farmers were an important part of rural and urban society but did not have an interest in an agriculture career due to the fact that they only equated agriculture with farming rather than other aspects of the industry (Holz-Clause & Jost, 1995).

Furthermore, perceptions of agriculture tend to identify with the common and dominate ideologies of what rural life looks like, (Norwood & Rutherford, 2009) for example, youth equated farmers with other general stereotypes such as overalls, chewing on straw (Holz-Clause & Jost, 1995), plaid shirts, and pitchforks (Smith, Park, & Sutton, 2009).

Moreover, research reveals that the urbanization of the population of the United States has contributed to inaccurate perceptions and low awareness of the agriculture industry (Robert & Lawver, 1995). An example of this is a study on urban high school students near Cornell University. Those surveyed did not feel that farmers made a lot of money, and were unaware of the important agriculture commodities leaving the state of New York. Conversely, those who lived on farms or in more rural areas had more positive and accurate perceptions of agriculture. Urban students also were not considered agriculturally literate despite the fact that New York's land grant school was close to the surveyed high schools (Smith, Park, & Sutton, 2009). A study on rural students involving eleventh grade students also found that although students that were studying agriculture in high school have a greater knowledge of agriculture, a weak positive relationship existed between knowledge of agriculture and perception of agriculture scores (Wright, Stewart, & Birkenholz, 1994).

In a 1995 study university students gave insight to views on agriculture. It was found that they perceived America's food supply to be safe and said agriculture positively impacts our economy. In terms of college major, students from the law and education schools had the same perceptions as college of agriculture students. However, students from other colleges differed from the college of agriculture students on one or more factors (Robert & Lawver, 1995). Furthermore, agricultural communications students, Agriculture Communicators of Tomorrow and those enrolled in agricultural communications courses at 11 universities were found to have more positive perceptions of agriculture if their families owned agricultural property, or had lived on a farm or ranch (Wingenbach, Rutherford, & Dunsford, 2003).

In terms of agricultural organizations, 4-H and FFA are also represented in previous studies of agricultural perceptions. Frick, Birkenholz, & Machtmes (1995b) found in a study involving Midwestern 4-H members that 4-H members understood agriculture most in the areas of natural resources and marketing of products and the lowest in terms of plant production. 4-H members from farms of ten to fifty acres and were enrolled in a high school agriculture program produced positive perceptions of agriculture while those who were not enrolled in a high school agriculture program produced less positive perceptions of agriculture (Frick, Birkenholz & Machtmes, 1995b).

Purpose of Study

The purpose of this study was to determine factors affecting students' memory recall of print news articles in agriculture. The objectives were to:

Objectives

- (a) Compare students' memory recall of print news article content when compared by photographic presence;
- (b) Determine if significant differences existed in students' perceptions of print news articles' content when compared by selected demographics;
- (c) Determine if significant differences existed in students' perceptions of the milk article when compared by test administration (pretest vs. posttest).

Methods

The descriptive study conducted aimed to explain if photographs had an effect on the perceptions of agriculture in news articles pertaining to natural disasters. A pretest-posttest design was used to compare treatment groups with the treatment being photographs. During the initial experimental session, respondents were asked to read three news reports. One involved a poorly executed California milk campaign, which acted as the control of the study in order to maintain a baseline of data. The other two articles addressed the cattle industry during the 2011 drought in Texas and a flood plain in New York after tropical storm Irene. The article regarding the drought in Texas interviewed cattle ranchers from other states that were benefiting from the reduced prices on Texas cattle sold. While the article about the flood plain in New York interviewed the farmers who were affected in the region after tropical storm Irene.

Half the sample received these articles with photographs while the other half received the same articles without photographs. The milk article was not altered in any way, including the images, and served as a constant. The drought in Texas and article had images manipulated while the flood article kept the original images ran in the newspaper.

An interval of ten days separated the pretest and a recall-based posttest. The participants' perceptions of drought in Texas and the flood plain in New York were determined upon analysis of data collected from a survey.

Two introductory courses at Texas A&M University were surveyed with a ten-day time period between each survey instrument. The classes included class *AGLS 101—Modern Agricultural Systems and Renewable Natural Resources* and an introductory agricultural communications course *AGCJ 105—Introduction to Agricultural Communications*.

These two courses comprised of 336 freshman, 200 sophomores, 102 juniors and 50 seniors in the population. They also majored in 43 different majors at Texas A&M University.

The two agricultural classes allowed for the analysis of the agricultural perceptions, under the assumption that these students have an understanding of agricultural issues. This further expands the study when looking at possible media bias because it is assumed these students have a basis of understanding in terms of agriculture.

The population of interest for this study was College of Agriculture and Life Sciences students at Texas A&M University in the. Based on the 2011 enrollment report from Texas A&M, undergraduate enrollment at the university was 39,867 with 5,631 of these students enrolled as agriculture majors (Office of Institutional Studies and Planning, 2011). These two courses surveyed comprised of 336 freshman, 200 sophomores, 102 juniors and 50 seniors in the population. They also represented 43 different Texas A&M University majors.

Two course sections of *AGLS 101—Modern Agricultural Systems and Renewable Natural Resources* and one section of *AGCJ 105—Introduction to Agricultural Communications*. However, the students in the accessible population were not all agriculture majors. These students were selected because they were assumed to have some interest and base of knowledge about agriculture regardless of major. *AGLS 101* had 581 students enrolled while *AGCJ* has 104 students enrolled. A total of 676 surveys were distributed to all enrolled in these two courses.

The same demographic questions were presented to the entire sample. A response rate of 42% (290 students) was reported for the initial survey. 92 respondents received news reports with no accompanying photographs while 198 students received news reports with photographs. Each student had an equal and independent chance of being assigned to each group.

A response rate of 59% (155 students) also responded to the second follow-up survey. An interval of 10 days separated the pretest and the posttest.

The research instrument consisted of a both pre and post surveys to measure student perceptions of images used in two agricultural-related news articles. The pre-study recipients could have received a survey with photographs or no photographs. This study was approved by the Institutional Review Board (IRB#2011-0879).

All surveys utilized a five-point Likert-type scale. These were worded so the students' reactions to them were reflective of both positive and negative statements. Students then responded as to whether they *strongly disagreed, disagreed, agreed or strongly agreed* to the statements. This strategy was based upon Measurement of Communication Behavior book (1989) and the attitude measurement methods described in the book (Barker & Emmert, 1989).

The first instrument (pretest) was comprised of three news articles. The first article, "*Milk Campaign Ended Amid Social Media Firestorm*" was the constant in both surveys and included photos. This article was released in the *New York Times* on July 22, 2011, and was chosen because of its wide appeal to many audiences and its fairly uncontroversial topic in relation to agriculture. The twelve questions following the article asked about respondent perceptions of the article, as well as the associated images. Aside from this article, one group received the following two news articles with photographs while the other received no photographs.

The second article, "*As ranchers in drought-stricken southwest sell cattle, some northern states see chance to grow,*" contained twenty statements about the perceptions of the article as well as the images associated with the article. This article was released from the *Associated Press* on September 12, 2011, and was printed in multiple

nationwide newspapers. This article was chosen because of the relevance it holds to the drought situation in Texas. In this article out of state farmers are interviewed and state the drought has benefited their out-of-state cattle businesses because of reduced prices on Texas cattle.

Additionally, the third article, "*Upstate farmers find that a fertile flood plain is a two-edged sword,*" also contained twenty statements about their perceptions of the article as well as the images associated with the article. This article was also obtained from the *New York Times* and was released on August 30, 2011. This article was chosen because of the relevance it holds to the flood situation in New York. It interviewed farmers in New York who had suffered personal loss from the tropical storm and personal accounts of their declining business were recorded.

Ten days following the initial survey, a follow-up instrument (posttest) was sent to the respondents to the initial survey. The first article, "*Milk Campaign Ended Amid Social Media Firestorm*" remained constant in terms of questions but had photographs removed. The other two articles were presented, with all photos removed, and included statements about their long-term perceptions and recall of the articles' content using a 5-point Likert-type scale (Barker & Emmert, 1989).

Students' demographic information pertaining to their agricultural background was collected in the pretest as well. These questions included if their family is involved in agriculture and the type (production, retail, or processing) if their family is involved in agriculture, agricultural associations, if they live on an active farm or ranch, and the size

of their hometown (rural, suburban, or urban). They were also asked if they were involved in 4-H and FFA in high school.

Article perceptions of the drought and flood articles (questions 1-11) in the pretest were summated to produce a Cronbach's alpha of .75 and .71, respectively. Questions 3 and 4 were omitted from both article questions, as they did not contribute to overall reliability. Furthermore, photo perceptions of the drought and flood articles (questions 12-20) in the pretest were also summated to produce a Cronbach's alpha of .84 and .72, respectively. Questions 14 and 15 were reverse coded in the drought article in order to accurately depict student answers. Furthermore, questions 14 and 16 were omitted from the flood article question, as they also did not contribute to overall reliability. This reliability is a summed score and was applied to the t-tests run throughout the study.

Threats to internal validity may have existed in the posttest considering participation in the study was voluntary. Thus, those responding to the posttest may have felt strongly about the topic of agriculture and present somewhat skewed answers. Consequently, external validity might have been threatened by the pre-post test design as the participants may have been sensitized to the treatment (posttest) they knew what to expect after taking the pretest. Therefore, we can only generalize the results of this study to the sample at hand.

Data Collection

The research instrument was administered through Qualtrics.com. Design guidelines for web-based surveys were followed using Dillman's tailored design method (2007).

Students were sent a link to the online survey through their Texas A&M University email account. A pre-notice email was sent to those enrolled in each course followed by the initial survey and the follow-up survey. Each email outlined the time parameters associated with each respective survey. In order to maintain confidentiality, surveys were number coded. Students were then able to complete the survey at the computer of their choice. Each survey took no more than 20 minutes to complete.

Data Analysis

Statistical data analysis was performed using SPSS 20. Frequencies, percentages, means, and standard deviations were used to analyze the data from both surveys.

To compare students' memory recall of print news article content when compared by photographic presence an independent t-test was used on the follow-up survey. The resulting data was based upon the posttest questions associated with the drought and flood article. These questions pertained to their recall of each article's content.

In order to see if significant differences existed in students' perceptions of print news articles' content when compared by selected demographics an ANOVA test was used. Hometown size, family involvement in agriculture, membership to an agricultural

association, current residence on a farm or ranch, and involvement in 4-H and FFA in high school were collected from the pretest.

Finally, a paired sample t-test was used to determine if significant differences existed in students' perceptions of print news articles' content when the pretest and posttest were compared. These answers were collected from both the pre and posttests in the milk article.

All answers include in the research instrument were assumed to be honest and reliable. A significance level of .05 was set with a confidence level of 95%.

Results

As shown in Table 8, there were no significant differences when comparing students who received the pretest photos and those who did not when memory recall of print news article was compared by the posttest. This difference was not significant in the drought posttest article ($t(154) = -.21, p > .05$) or the flood posttest article ($t(153) = -.51, p > .05$).

Table 8

Memory Recall of Posttest When Compared by a Photographic Presence

	Photo	<i>n</i>	Mean ¹	<i>SD</i>	<i>t</i>	Sig.
Drought Posttest	Photo	108	7.44	1.92	-.21	.84
	No Photo	47	7.51	1.54		
Flood Posttest	Photo	108	7.36	1.82	-.04	.97
	No Photo	46	7.35	1.88		

Note. ¹ 11 questions were summed to generate means representing respondents' recall of print news stories and could have ranged from 0 to 11. ² Questions answered incorrectly were coded as 0 while those answered correctly were coded as 1

Nonetheless, there were some significant differences seen between students who have family who work in agriculture, claim membership to an agriculture association, live on a farm or ranch, and were members of FFA. These differences are shown in Table 9.

Those who had family who worked in agriculture saw the drought article more positively than those who did not, ($F(98, 180) = 7.97, p < .05, \eta^2 = .028, 1 - \beta = .803$). This value ($1 - \beta$) shows an acceptable level of power, ($> .8$) but could be due to chance or error. Additionally, the same positivity was seen in the drought article with those students who claim membership to an agriculture association, ($F(76, 202) = 5.13, p < .05, \eta^2 = .018, 1 - \beta = .617$). Those who live on an active farm or ranch also saw the drought article to be more positive than those who did not, ($F(97, 180) = 6.17, p < .05, \eta^2 = .022, 1 - \beta = .697$). Furthermore, those who were involved in FFA in high school saw the drought article in a more positive light than those who did not, ($F(118, 159) = 10.22, p < .05, \eta^2 = .036, 1 - \beta = .890$). This value also represents an appropriate power to presume solid significance, but still could be attributed to error or chance.

Table 9

Students' Perceptions of Print News Articles' Content When Compared by Selected Demographics

Demographic	Story	Sub-groups	n	M ¹	SD	F	Sig.
Residence	Drought	Rural	117	28.06	3.26	1.14	.32
		Suburban	83	27.42	2.99		
		Urban	78	27.54	3.33		
		Total	278	27.72	3.21		
	Flood	Rural	117	25.45	3.65	.57	.57
		Suburban	83	25.73	2.71		
		Urban	78	25.19	3.05		
		Total	278	25.46	3.22		
Family in Ag	Drought	Yes	98	28.47	3.08	7.97*	.01
		No	180	27.34	3.22		
		Total	278	27.74	3.21		
	Flood	Yes	98	25.82	3.29	1.71	.19
		No	180	25.29	3.18		
		Total	278	25.47	3.22		

Table 9 (cont.)

Demographic	Story	Sub-groups	n	M ¹	SD	F	Sig.
Ag Association	Drought	Yes	76	28.45	2.94	5.13*	.02
		No	202	27.48	3.28		
		Total	278	27.74	3.21		
	Flood	Yes	76	26.01	3.75	2.94	.09
		No	202	25.27	2.98		
		Total	278	25.47	3.22		
Live on Farm/Ranch	Drought	Yes	98	28.39	3.16	6.17*	.01
		No	181	27.40	3.18		
		Total	279	27.75	3.21		
	Flood	Yes	98	25.57	3.31	.14	.71
		No	181	25.42	3.18		
		Total	279	25.47	3.22		

Table 9 (cont.)

Demographic	Story	Sub-groups	n	M ¹	SD	F	Sig.
4-H	Drought	Yes	85	28.04	3.17	1.08	.30
		No	192	27.60	3.24		
		Total	277	27.73	3.22		
	Flood	Yes	85	25.56	2.99	.08	.77
		No	192	25.44	3.33		
		Total	277	25.48	3.23		
FFA	Drought	Yes	119	28.46	3.26	10.22*	.00
		No	160	27.24	3.09		
		Total	279	27.76	3.22		
	Flood	Yes	119	25.65	3.71	.68	.41
		No	160	25.33	2.82		
		Total	279	25.46	3.23		

Note. ¹ 9 questions were summed to generate means representing respondents' perceptions of print news stories and could have ranged from 9 to 36.

When comparing differences between responses in regards to the milk article pretest and posttest, as seen in Table 10, significant differences were seen in constructs related to positive photographs, humorous photographs, offensiveness to women, and shocking photographs.

Photos were considered more positive in the posttest than in the pretest, ($t(153) = -3.05, p > .05$). However, they also saw the photos as more humorous in the pretest, $t(154) = 5.99, p < .05$, as well as more offensive to women, ($t(153) = 2.13, p < .05$). Photos were also seen as more shocking to respondents in the posttest, ($t(152) = -4.29, p < .05$).

Table 10

Students' Perceptions of the Milk Article When Compared by Pretest vs. Posttest.

Statements	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	Sig.
The photographs associated with this article were negative – Pretest	154	2.37	.70	.84	.40
The photographs associated with this article were negative – Posttest	154	2.32	.65		
The photographs associated with this article were positive- Pretest	154	2.33	.66	-3.05	.00*
The photographs associated with this article were positive- Posttest	154	2.49	.59		
The photographs associated with this article were humorous- Pretest	155	3.17	.71	5.99	.00*
The photographs associated with this article were humorous- Posttest	155	2.80	.63		
The photographs associated with this article were offensive to women- Pretest	154	2.36	.76	2.13	.03*
The photographs associated with this article were offensive to women- Posttest	154	2.25	.70		

Table 10 (cont.)

Statements	<i>n</i>	<i>M</i> ¹	<i>SD</i>	<i>t</i>	Sig.
The photographs influenced my perception of the article- Pretest	153	2.44	.71	.20	.84
The photographs influenced my perception of the article- Posttest	153	2.42	.63		
These photographs were shocking to me- Pretest	153	1.76	.64	-4.29	.00*
These photographs were shocking to me - Posttest	153	1.99	.60		
Ending the campaign was a good marketing decision - Pretest	154	2.77	.73	1.45	.15
Ending the campaign was a good marketing decision - Posttest	154	2.68	.66		
The backlash generated by the advertising campaign was warranted- Pretest	154	2.52	.60	-.12	.90
The backlash generated by the advertising campaign was warranted- Posttest	154	2.53	.61		
The goddiscussion.com site should have replaced the everythingidoiswrong.org site - Pretest	154	2.45	.59	.58	.56
The goddiscussion.com site should have replaced the everythingidoiswrong.org site - Posttest	154	2.42	.64		
The source of this article influenced my perception of the issue - Pretest	152	2.33	.64	-1.31	.19
The source of this article influenced my perception of the issue - Posttest	152	2.40	.62		

*Note.*¹ Likert-type scale: 1 = Strongly Disagree, 2 = Disagree 3 = Agree 4 = Strongly Agree

Conclusions and Recommendations

Since there is little information regarding the recall of photographs in print news in terms of recall, this study begins to give insight to the effects of memory recall in print news. There were no difference between the students who received photographs in the pretest and those who didn't in terms of their recall values. This might lead researchers to believe that although photographic effects are important in terms of enhancing news articles (Rosser, 1998) it might not contribute to recall values of article content. Thus, explaining the lack of information in terms of research on recall of news content. However, this study only allowed 10 days between the two surveys. This may have also been a contributing factor in the recall value of the articles' content.

However, it is important to evaluate at the effects the milk article had in terms of pre and posttest results. Since students were not provided photos in the posttest, their outlook on the photographs was solely based on recall. This is relevant because students, even after only ten days remembered the photographs as less funny, less offensive to women and more shocking, and more positive. This indicates that with the inclusion of photographs, the campaign photos were better received in terms of offensiveness and humor. The fact that the photos were considered more positive and more shocking also indicates their originally intended effect (to be humorous) as indicated in the article was lost when the photographs were removed. All in all, it is probable to argue that the photographs should remain with the story about the controversy in order to accurately depict what began the conflict in the first place in order to not sensationalize the campaign and make it sound worse than it was. The inclusion of the photos with the

story also allow readers to make their own assumptions of the campaign and not be swayed by the fact that there was controversy relating to the photos.

The analysis of demographic information gives insight to a more agriculturally centered topic. The demographics that represented differences included family associations with agriculture, residence on a farm or ranch, membership to an agriculture association and former membership in FFA. All of those who answered yes to these demographics saw the drought article to be more positive than those who said no. These findings solidify previous research that students' background or interest in agriculture increase agriculture positivity and literacy (Wright, Stewart, Birkenholz, 1994, Wingenbach, Rutherford, & Dunsford, 2003 & Frick, Birkenholz & Machtmes, 1995b).

Although the drought article had a somewhat skewed representations of the drought situation in Texas, respondents could have seen it in a positive light because agriculture and the drought was getting national news coverage, thus, bringing awareness to the situation in Texas regardless of the spin on the article.

They were also aware of accurate depictions of photographs in terms of tropical storm Irene coverage. Their recall of article content regarding these two events did not increase with the inclusion of photographs although students that had a more extensive agriculture background (agriculture associations, family being involved in agriculture, former FFA affiliation, and residence on a farm or ranch) did have more positive outlooks on the drought article which could be attributed to the coverage of Texas agriculture in national news—regardless of the topic.

All in all, it is probable to argue that the photographs should remain with controversial stories in order to accurately depict what began the conflict in the first place in order to not sensationalize the campaign and make it sound worse than it was. Thus, allowing readers to draw their own conclusions about various topics in and outside of agriculture.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This study found student perceptions of the two news articles related to the 2011 Texas drought as well as the aftermath of tropical storm Irene to be the same regardless if they received photographs or not. This would lead the researcher to conclude that the photos had no effect on the overall perceptions of the news stories. Another possibility of the story content being overwhelming in comparison to the treatment of photographs and no photographs also exists. These findings may also negate previously stated research in regards to photographic effects of news stories.

However, students who received photographs did see a relationship between the photos associated with the flood article and the content presented in the story. This effect was not recorded with the photographs of the drought story. Since the photos associated with the flood story were the original photos printed with the news story, it is possible to conclude that students properly associated photographic elements with that of the story's content. Photos presented in the survey with the drought article, showed blue skies, green grasses, and cattle eating. No correlations were seen between these two elements. This non-relationship is equally as powerful due to the fact that the story, although spun positively in favor of out of state cattle ranchers, did not in fact depict what was occurring in Texas during the drought. Therefore, it can be concluded that although students were not swayed by photographic effects as found in objective one, were cognizant of the situation occurring in Texas and were able to identify that the photographs were not accurately depicting the situation in Texas.

Since photographic effects are historically seen to enhance photographs and define individual decisions on various issues (Anderson, Dewhirst, & Ling, 2006; Brandth, 1999), it is fair to assume the concept of a cognitive springboard exists in agriculture related issues (Henkel, 2011). The fact that no relationship was seen between the somewhat positive photographs presented with the article relating to the Texas drought and the article content, although spun positively, solidifies previous research relating to human processes and photographic effects. This conclusion made due to the fact that the majority of students surveyed presumably had some sort of agricultural background or interest had some preconceived notions relating to the drought in Texas as shown by the results of the demographic analysis. They may have been based on their personal experiences or agricultural backgrounds.

Since there is little information regarding the recall of photographs in print news in terms of recall, this research gives insight to the effects of memory recall in print news. There were no difference between the students who received photographs in the pretest and those who didn't in terms of their recall values. This might lead researchers to believe that although photographic effects are important in terms of enhancing news articles (Rosser, 1998) it might not contribute to recall values of article content. Thus, explaining the lack of information in terms of research on recall of news content. Furthermore, the third objective gave insight to students' perceptions of the media outlet that ran the milk campaign news story. Since there was a difference seen between self-perceived advocates and non-advocates in terms of the source of the news article, it also might be probable to presume that students who considered themselves advocates were

more aware of the source of the article and less swayed by the *New York Times*. It also may also be fair to conclude that the students recognized the news article was released by a national accredited newspaper rather than an agricultural group and might not see the New York Times as a source that would significantly sway their preconceived opinions of the dairy industry. Furthermore, these findings may also indicate that based on self-perceived advocacy status, the images had no effect but rather the *topic* of the article.

However, it is important to evaluate the effects the milk article had in terms of pre and posttest results. Since students were not provided photos in the posttest, their outlook on the photographs was solely based on recall. This is relevant because students, even after only ten days remembered the photographs as less funny, less offensive to women, more positive and shocking. This indicates that with the inclusion of photographs, the campaign photos were better received in terms of humor and positivity. This indicates their originally intended effect (to be humorous) as indicated in the article was lost when the photographs were removed. All in all, it is probable to argue that the photographs should remain with the story about the controversy in order to accurately depict what began the conflict in the first place in order to not sensationalize the campaign and make it sound worse than it was. The inclusion of the photos with the story also allows readers to make their own assumptions of the campaign and not be swayed by the fact that there was controversy relating to the photos.

The analysis of demographic information gives insight to a more agriculturally centered topic. The demographics that represented differences included family

associations with agriculture, residence on a farm or ranch, membership to an agriculture association and former membership in FFA. All of those who answered yes to these demographics saw the drought article to be more positive than those who said no. These findings solidify previous research that students' background or interest in agriculture increase agriculture positivity and literacy (Wright, Stewart, Birkenholz, 1994, Wingenbach, Rutherford, & Dunsford, 2003 & Frick, Birkenholz & Machtmes, 1995b).

Although the drought article had a somewhat skewed representations of the drought situation in Texas, respondents could have seen it in a positive light because agriculture and the drought was getting national news coverage, thus, bringing awareness to the situation in Texas regardless of the spin on the article.

Research Implications and Recommendations

Results of this research show that in the case of these natural disasters, there was no dramatic effect of photographs persuading readers. Students in introductory courses in the College of Agriculture at Texas A&M University were in touch because drought was a predominant media issue throughout Texas, not just in agriculture with agriculture issues offering in the state relating to the 2010-2011 Texas drought. They were also aware of accurate depictions of photographs in terms of tropical storm Irene coverage. Their recall of article content regarding these two events did not increase with the inclusion of photographs although students that had a more extensive agriculture background (agriculture associations, family being involved in agriculture, former FFA affiliation, and residence on a farm or ranch) did have more positive outlooks on the

drought article which could be attributed to the coverage of Texas agriculture in national news—regardless of the topic.

Students who were self-perceived milk advocates also appeared to be less persuaded by the source of the article regarding the milk campaign. This is likely attributed to students' positive preconceived notions regarding the milk industry. They also showed to have stronger reactions to the photographs when asking to recall them (ie: no photos provided in posttest).

With this in mind, it remains imperative that photographs accurately depict issues in print news in order to continue to see large scale relationships between news content and news photographs. Although replicating this study utilizing students outside of an agriculture college may indicate different results, it still remains important to accurately pair story content with photographs as to not confuse or coerce readers into false perceptions of any topic.

Since students did not see a relationship between the drought article photos and its content, researchers can conclude that because we surveyed Texas students they were aware of the situation through personal experience. Therefore it would also be important to examine student perceptions of this study outside of the state of Texas in order to determine if those surveyed let their surroundings impact their perceptions rather than the photographs provided.

In terms of associating the source of the article and self-perceived advocacy, it would also be valid to examine which media sources persuade students who claim to be advocates of various agriculture issues. This would indicate how journalists should

precede in terms of coverage of various news topics since preconceived notions of agriculture topics seem to be of importance to readers.

These findings also give great insight to further practices by journalists since recall value was not heightened by photographs. Therefore, the accurate portrayal content of news articles must remain the priority of journalists covering agriculture issues. These findings also support the policy of journalists to understand their audiences prior to producing news materials.

All in all, it is probable to argue that the photographs should remain with controversial stories in order to accurately depict what began the conflict in the first place in order to not sensationalize the campaign and make it sound worse than it was. Thus, allowing readers to draw their own conclusions about various topics in and outside of agriculture.

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APPENDIX A

Pretest- Photos

Milk Article Questions:

1. The photographs associated with this article are negative
2. The photographs associated with this article are positive.
3. The photographs associated with this article are humorous..
4. The photographs associated with this article are offensive to women.
5. These photographs are shocking to me.
6. These photographs influenced my perception of the article.
7. These photographs are shocking to me.
8. Ending the campaign was a good marketing decision.
9. The backlash generated by the advertising campaign was warranted.
10. The goddiscussion.com site should have replaced the everythingidoiswrong.org site.
11. I am an advocate for milk consumption.
12. I am an advocate for dairy farmers.
13. The source of this article influenced my perception of the issue.

Drought Article Questions:

1. This news article is valid.
2. This news article is accurate.
3. The article describes an issue that will take days to solve.
4. The article describes an issue that will take months to solve.
5. The article describes an issue that will take years to solve.
6. The source of this article influences my perception of the issue.
7. The drought harms agriculture outside of Texas.
8. The drought harms the economy outside of Texas.
9. The drought harms the economy in Texas.
10. The drought harms agriculture in Texas.
11. The drought will affect consumers long-term.
12. These photographs accurately depict the drought.
13. These photographs accurately depict agriculture's current situation.
14. These photographs associated with this article portray agriculture positively.
15. These photographs associated with this article portray agriculture negatively.
16. The photographs associated with this article are positive.
17. The photographs associated with this article are negative.
18. The photographs associated with this store are valid.
19. The photographs associated with this story are accurate.
20. These photographs influence my perception of the article.

Flood Article Questions

1. This news article is valid.
2. This news article is accurate.
3. The article describes an issue that will take days to solve.
4. The article describes an issue that will take months to solve.
5. The article describes an issue that will take years to solve.
6. The source of this article influences my perception of the issue.
7. The flood harms agriculture outside of Texas.
8. The flood harms the economy outside of Texas.
9. The flood harms agriculture in Texas.
10. The flood harms the economy in Texas.
11. The flood will affect consumers long-term.
12. These photographs accurately depict the flood.
13. These photographs accurately depict agriculture's current situation.
14. These photographs associated with this article portray agriculture positively.
15. These photographs associated with this article portray agriculture negatively.
16. The photographs associated with this article are positive.
17. The photographs associated with this article are negative.
18. The photographs associated with this store are valid.
19. The photographs associated with this story are accurate.
20. These photographs influence my perception of the article.

Demographic Questions:

Have you ever worked in the agriculture industry? (Check all that apply)

- Production
- Retail
- Processing

Does your family work in the agriculture industry?

Have you ever been or are you currently a member of an agriculture association?

If yes, please list all that apply.

Does your family or one family member, work in the agriculture industry.

Did you grow up or live on a farm or ranch?

Does your family live on a active farm or ranch?

Were you involved in 4-H?

Were you involved in FFA?

How would you describe the location where you grew up?

- Rural (Calvert, Hico, Canyon)
- Suburban (College Station, Lubbock, Waco)
- Urban (Dallas, Houston, San Antonio)

APPENDIX B

Pretest- No Photos

Milk Article Questions:

1. The photographs associated with this article are negative
2. The photographs associated with this article are positive.
3. The photographs associated with this article are humorous..
4. The photographs associated with this article are offensive to women.
5. These photographs are shocking to me.
6. These photographs influenced my perception of the article.
7. These photographs are shocking to me.
8. Ending the campaign was a good marketing decision.
9. The backlash generated by the advertising campaign was warranted.
10. The gotdiscussion.com site should have replaced the everythingidoiswrong.org site.
11. I am an advocate for milk consumption.
12. I am an advocate for dairy farmers.
13. The source of this article influenced my perception of the issue.

Drought Article Questions:

1. This news article is valid.
2. This news article is accurate.
3. The article describes an issue that will take days to solve.
4. The article describes an issue that will take months to solve.
5. The article describes an issue that will take years to solve.
6. The source of this article influences my perception of the issue.
7. The drought harms agriculture outside of Texas.
8. The drought harms the economy outside of Texas.
9. The drought harms the economy in Texas.
10. The drought harms agriculture in Texas.
11. The drought will affect consumers long-term.

Flood Article Questions

1. This news article is valid.
2. This news article is accurate.
3. The article describes an issue that will take days to solve.
4. The article describes an issue that will take months to solve.
5. The article describes an issue that will take years to solve.
6. The source of this article influences my perception of the issue.
7. The flood harms agriculture outside of Texas.
8. The flood harms the economy outside of Texas.
9. The flood harms agriculture in Texas.

10. The flood harms the economy in Texas.
11. The flood will affect consumers long-term.

Demographic Questions:

Have you ever worked in the agriculture industry? (Check all that apply)

- Production
- Retail
- Processing

Does your family work in the agriculture industry?

Have you ever been or are you currently a member of an agriculture association?

If yes, please list all that apply.

Does your family or one family member, work in the agriculture industry.

Did you grow up or live on a farm or ranch?

Does your family live on a active farm or ranch?

Were you involved in 4-H?

Were you involved in FFA?

How would you describe the location where you grew up?

- Rural (Calvert, Hico, Canyon)
- Suburban (College Station, Lubbock, Waco)
- Urban (Dallas, Houston, San Antonio)

12.

13. The flood harms the economy in Texas.

14. The flood will affect consumers long-term.

APPENDIX C

Posttest

Milk Article Questions

1. The photographs associated with this article are negative
2. The photographs associated with this article are positive.
3. The photographs associated with this article are humorous..
4. The photographs associated with this article are offensive to women.
5. These photographs are shocking to me.
6. These photographs influenced my perception of the article.
7. These photographs are shocking to me.
8. Ending the campaign was a good marketing decision.
9. The backlash generated by the advertising campaign was warranted.
10. The gotdiscussion.com site should have replaced the everythingidoiswrong.org site.
11. I am an advocate for milk consumption.
12. I am an advocate for dairy farmers.
13. The source of this article influenced my perception of the issue.

Drought Article Questions

1. This news article was valid.
2. This news article was accurate.
3. Cattle ranchers in the southwest states are benefiting from the drought.
4. Cattle ranchers in the northern states are benefiting from the drought.
5. The U.S. beef cattle industry is expanding.
6. The U.S. beef cattle export market is declining.
7. The drought harmed the agriculture outside of Texas.
8. The drought harmed the economy outside of Texas.
9. The drought harmed agriculture in Texas.
10. The drought harmed the economy in Texas.
11. This article accurately depicted agriculture's current situation.
12. This article portrayed agriculture positively.
13. This article portrayed agriculture negatively.
14. Feed for cattle is easily available to all producers.
15. Texas cattle producers are selling cattle because they do not have hay.

Flood Article Questions

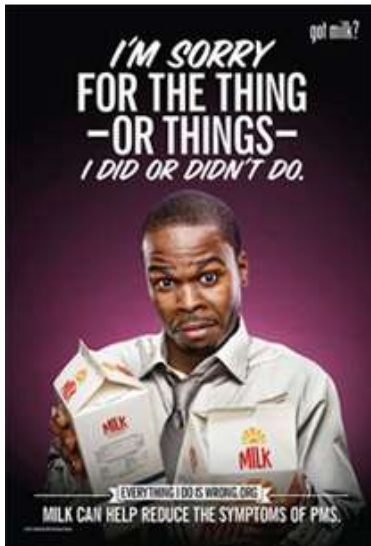
1. This news article was valid.
2. This news article was accurate.
3. Farms in the northern states are benefiting from the tropical storm.
4. Farms in the southern states are benefiting from the tropical storm.
5. Farms in the northern states are hurting from the tropical storm.

6. Farms in the southern states are hurting from the tropical storm.
7. The flood harms the economy in Texas.
8. The flood harms the economy in New York.
9. The flood will affect consumers long-term.
10. Farmers were forced to throw out milk due to a lack of trucks for transport.
11. Farmers' markets are being affected by the flood.
12. Plant disease is an issue after the flood.
13. Some New York farmers cannot afford crop insurance.
14. This article portrayed agriculture positively.
15. This article portrayed agriculture negatively.

APPENDIX D

Photos

Milk Article



Drought Article



Flood Article



VITA

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