PERSUASIVE EFFECT OF NARRATIVE AND STATISTICAL EVIDENCE

COMBINATIONS

by

CHELSEA GOOD

B.S., Kansas State University, 2008
B.A., Kansas State University, 2008
B.A., Kansas State University, 2008

A THESIS

submitted in partial fulfillment of the requirements for the degree

MASTER OF ARTS

Department of Communication Studies
College of Arts and Sciences

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2010

Approved by:

Major Professor
Nicole Laster, PhD

Copyright

CHELSEA GOOD

2010

Abstract

This study examines the effect of using a combination of narrative and statistical evidence on persuasion. Literature is divided on whether narrative or statistical evidence is more persuasive. There are a number of explanations to support both arguments, but arguing that one is superior may be flawed because these evidence types function differently and are not necessarily competitive. A few studies support the use of both narratives and statistics together, but none of these studies address the proportions when combining the two evidence types. This study fills the gap by creating messages with different degrees of anecdotal and statistical evidence. Conditions range from full anecdotal support to full statistical support and include three blended conditions (25/75, 50/50, 75/25). A total of 384 participants were surveyed via a national survey company. Results indicate that evidence type (narratives or statistics) and the various blends of evidence type do not change the persuasive effectiveness of a claim. While supporting persuasive claims with some kind of evidence is imperative, general populations do not favor one evidence type (narratives or statistics) over the other, and in fact, may be split in what they find more effective. Nor do people believe that evidence types function all that differently—at least when it comes to the support they provide for claims from livestock producers. Results, implications and recommendations for future research are discussed in detail.

Table of Contents

List of Figures

List of Tables

Acknowledgements

Dedication

To my parents, for meaning it when they said I could be anything I wanted to be and providing the tools and support to get me wherever I wanted to go.

CHAPTER 1 - Rationale

The use of evidence to back up a claim increases the persuasive impact of a message (Cathcart, 1955; Reinard, 1988), and aids in source credibility (McCroskey, 1969). Of particular interest to scholars has been the persuasive effect of narrative and statistical evidence. The following table shows the varying results of these studies.

Table 1.1 Previous Studies Findings

NARRATIVES > STATISTICS	STATISTICS > NARRATIVES	NO CLEAR ADVANTAGE
Brosius (2000)	Ah Yun & Massi (2000)	Baesler (1997)
Dickson (1982)	Allen & Preiss (1997)	Cox & Cox (2001)
Kahneman & Tversky (1972, 1973)	Baesler & Burgoon (1994)	Hoeken (2001b)
	Chaiken & Maheswaran (1994)	Iyengar & Kinder (1987)
Kazoleas (1986, 1993)	Greene (2003)	Nadler (1983)
Morgan et al. (2002)	Hoeken (2001a, 2005)	
Nisbett et al. (1976)	Hoeken and Hustinx (2006)	
Nisbett & Borgida (1975, 1977)	Hornikx (2005, 2007, 2008)	
Nisbett & Ross (1980)	Reynolds & Reynolds (2002)	
Reinard (1988)	Slater & Rouner (1996)	
Sherer & Rogers (1984)		
Stitt & Nabi (2005)		
Taylor & Thompson (1982)		

Several studies have shown that narrative messages invoke stronger images and produce stronger emotional reactions, permitting the receiver to identify with the message. As a result, narratives are viewed as more persuasive than statistical evidence (Bosius, 2000; Dickson, 1982; Kahneman & Tversky, 1972, 1973; Kazoleas, 1986, 1993; Morgan, Cole Shuttmann & Piercy, 2002; Nisbett, Borgida, Crandall & Reed, 1976; Nisbett & Borgida, 1975; Nisbett & Ross, 1980; Reinard, 1988; Sherer & Rogers, 1984; Stitt & Nabi, 2005; Taylor & Thopmson, 1982). For example, Ah Yun and Massi (2001) found that narrative messages encouraging people to sign organ donor cards increased reactions of sympathy, happiness and perceived vividness in the recipients and as a result improved the persuasive ability of messages.

However, other studies have demonstrated that statistical evidence is more persuasive than narrative evidence (Ah Yun & Massi, 2000; Allen & Preiss, 1997; Baesler & Burgoon, 1994; Chaiken & Mahewswarn, 1994; Green, 2003; Hoeken, 2001a, 2005; Hoeken & Hustinx, 2006; Hornikx, 2005, 2007, 2008; Reynolds & Reynolds, 2002; Slater & Rouner, 1996). These researchers argue statistics are more powerful because they provide a logical, rational reason for believability as they accurately represent the larger population. In turn, statistics create greater perceptions of message and source credibility, which results in greater message acceptance. For example, when Kopfman, Smith, Ah Yun, and Hodges (1998) compared reactions to organ donor messages they found participants exposed to statistical messages listed more total thoughts, both positive and negative, on an open-ended questionnaire following the message exposure compared to the narrative message group. This indicates the participants who received statistical evidence were more cognitively engaged in processing the message and even considered potential counter arguments. The participants also rated the statistical messages as more credible than the narratives. This may be due to the fact the use of statistics increases the verifiability of information (Ah Yun & Massi, 2000) and presents the reader with a larger (and perhaps representative) sample size (Baesler & Burgoon, 1994). These logically sound backings of statistical evidence may help build the message's credibility as the receiver breaks the message down cognitively.

To complicate matters further, several studies argue the two evidence types are equally persuasive (Baesler, 1997; Cox & Cox, 2001; Hoeken, 2001b; Iyengar & Kinder, 1987; Nadlar, 1983). Studies by Cox and Cox (2001) and Hoeken (2001b) suggest that anecdotal evidence can be as persuasive as statistical evidence when working to prove a specific claim (i.e., adding streetlights in a particular town) and when the anecdotal situation is seen as sufficiently similar to the question at hand. However, statistical evidence performs better when supporting a general claim. Yet, even when found equally persuasive, participants rate narrative and statistical evidence differently on elements such as "personalness" and "scientificness" (Baesler, 1997).

The studies previously referenced treated anecdotal and narrative evidence as mutually exclusive. However, these evidence types are argued to serve different reactive functions. Assuming that messages rely on using one evidence type instead of the other is faulty. Fortunately, these evidence types may not need to solely be compared—or even compete for effectiveness. Rather, the evidence types could be combined, as Allen and Preiss note, "*It should*

be pointed out that the use of narrative and statistical evidence is not exclusive, a communicator could use both" (1997, p. 126, italics mine). It is this combination that is advocated by Reynolds and Reynolds (2002) when they state, "*for now, the best conclusion may be that the effective advocate is best advised to use both statistical and narrative evidence*" (p. 431, italics mine). This approach may increase the persuasive potential as combination messages may access persuasive benefits of both evidence types. However, there is a shortage of research examining the effect of combining evidence types.

While some researchers recognize the need for blending the two evidence types (Allen & Preiss, 1997; Kreuter, 2007; Kopfman et al., 1998), only a couple studies have looked closely into this possibility. Allen, Bruflat, Fucilla, Krame, McKellips, Ryan, and Spiegelhoff (2000) found that a combination of narrative and statistical evidence was more effective than just narrative evidence or just statistics. Hornikx and Houët (2009) also found a combination of narratives and statistics to be more persuasive than narratives alone. Still, more research is needed looking into evidence types. More specifically, examining varying blends of narrative and statistical evidence could help pinpoint a place of maximum persuasion.

Persuasion is a necessary component of relational success, especially in free market enterprises. This study is important because the ability to effectively construct a message using evidence is key to maximizing persuasion. This study expands on the idea of simply combining evidence types by exploring the degree to which each type should be used to create narrative/statistic evidence blends to back up messages. Different levels of evidence types can be expressed as balancing ratios blending narrative and statistical evidence. The implication of appropriate blends speaks to Reynolds and Reynolds' concern that "*advocates are also constantly confronted with balancing between detailed accounts of exacting scientific experiments and trying to group the data in the experiences of the audience*" (p. 436, italics mine). Moreover, business professionals will benefit from the guidance of solid persuasion research on how to effectively balance evidence to maximize persuasion.

Additionally, "*research focusing on the underlying qualities or analysis that examines what evidence does in the mind of the message receiver offers some substantial methods of improving the understanding of why such effects occur*" (Allen et al., 2000, p. 335, italics mine). Establishing whether or not the two evidence types have differences in the underlying qualities of narrative involvement and credibility gets at this concern. Finally, determining whether

statistics and narrative are more persuasive together or alone provides crucial information for those working to figure out how the different evidence types interact.

Thus the following questions emerge. Is some combination of narrative and statistic evidence more persuasive than messages supported by just one of the two evidence types? Additionally, how do different levels of narrative and statistical evidence alter the cognitive reaction of credibility and the affective reaction of narrative involvement?

CHAPTER 2 - Literature Review

For the purpose of this thesis, evidence refers to "*data (facts or opinions) presented as proof for an assertion*" (Reynolds & Reynolds, 2002, p. 429, italics mine). Rieke and Sillars (1984) suggest evidence can be broken down into different groupings, including the categories of specific instances and statistics. Specific instances include "*giving of examples and illustrations*" (p. 92). This type of evidence is also referred to as "*narrative evidence*" (Allen & Preiss, 1997; Reynolds & Reynolds, 2002), "*story evidence*" (Baesler & Burgoon, 1994), and "*anecdotal evidence*" (Hoeken, 2001a; Koballa, 1986). Rieke and Sillars (1984) define statistics as "*a numerical compacting of specific instances*" (1984, p. 94, italics mine). Many authors also use the term statistics when referring to this evidence type (Allen & Preiss, 1997; Baesler & Burgoon, 1994; Hoeken, 2001; Reynolds & Reynolds, 2002).

Case Context:

Different types of evidence present opportunities not only to supply the receiver with information backing up a belief in a position, but also allow the recipient to emotionally interact with the advocacy. The fact that evidence persuades a target audience by influencing beliefs is well supported (Kruglanski & Stroebe, 2005). Additionally, numerous studies suggest the emotional effects created by evidence also persuade (Clore & Schnall, 2005). A study of evidence blends affords us an opportunity to combine these persuasive effects.

Theoretical Framework: The Use of Narrative and Statistical Evidence

As noted, narratives and statistics function differently in persuasion. Kopfman et al. (1998) examined different reactions to narrative and statistical evidence used in supporting claims about organ donation. They found the statistical evidence generated more total issue-relevant thoughts, both positive and negative, when participants were asked after the stimulus to complete an open-ended measure listing their thoughts and feelings. Listing more thoughts and thoughts on multiple sides of the argument indicates the statistical evidence group engaged in more active cognitive processing considering the benefits and harms of the information presented. Additionally, the statistical evidence group ranked the message higher in

appropriateness, reliability, knowledgeability, credibility and thoroughness than the narrative evidence group did.

Alternatively, the group receiving the narrative evidence reported increased total affect or a greater number of emotions. Thus, Kopfman et al. (1998) concluded that statistics produce more cognitive reactions while narratives produce more affective reactions. They note, "*While evidence suggests that both statistical evidence messages and narratives can be persuasive in general and in the domain of organ donation research, previous research has not examined why both of the types of evidence can be persuasive or the reactions they typically engender*" (p 295, italics mine). They also suggest the need to test the interactive affect of combinations of narratives and statistics.

Other scholars agree that narratives and statistics perform different roles in persuasion. In attempt to explore some of the characteristics that make these evidence types unique, Baesler (1997) included the exploratory variables of personalness and scientificness of evidence in his study comparing narratives and statistics. He suggests, *"Personalness and scientificness of evidence … are characteristics unique to a particular type of evidence"* (Baesler, 1997, italics mine). Indeed, results showed that messages with narrative evidence ranked higher in personalness, indicating greater reader connection to the message. Statistical evidence was rated higher than narratives in scientificness, often a measure of rigor, and an indicator that could lead to increased perceptions of credibility.

Greene and Brinn (2003) found narratives and statistics functioned differently when used to support messages about the dangers of indoor tanning. Narratively supported messages increased perceptions of realism, indicating the recipients were connecting with these messages realizing the harms could also happen to them. Conversely, statistical evidence ranked higher than narrative evidence for information value, which suggests the statistical messages were perceived as more factual and credible.

Similar to Kopfman et al. (1998), these findings indicate fundamental differences between narratives and statistics. Specifically, narratives are superior to statistics in producing affective reactions and in particular building recipients feelings of narrative involvement with the message. Moreover, Baesler (1997) also contends "*the content and structure of the story, with characters engaged in a dialogue, are inherently more personal than statistics*" (p. 171, italics

mine). In each of these studies, the narrative message recipient perceived a greater emotional bond and even empathetic reaction towards the message.

The vivid nature of narratives may be one reason people easily connect with them (Nisbett & Ross, 1980). Baesler and Burgoon (1994) suggest, "*it is generally accepted that stories are more concrete, more imagery provoking, and more colorful than statistics that are often abstract, dry, and pallid*" (p. 585, italics mine). Additionally, the visual may help create a causal link as it is presumed to be more emotionally interesting (Taylor & Thompson, 1982). Moreover, people are exposed to the story-telling structure at an early age and also use it in everyday life to communicate. For these reasons, familiarity may also increase the appeal of narrative evidence. Further support of the narrative involvement effect of narrative evidence comes from findings that narratives are much more persuasive in situations when the narrative provided is similar to the claim it supports (Hoeken & Hustinx, 1997). It follows that the message recipient connects with the story more when it is similar to his or her own situation and this narrative involvement that results in increased persuasion.

Statistics fulfill a different role. They generally increase cognitive effects and in particular, increase participant's perception of the credibility of a message. "*Statistics, by including numerical data based on some type of research, are often perceived as inherently more scientific than stories,*" (Baesler, 1997, p. 170, italics mine). Statistical messages also produce more total thoughts, both positive and negative, than narrative messages (Kopfman et al, 1998). In other words, people process messages with statistical evidence more. The recipient evaluates both the value of the argument and considers potential counter arguments. Additionally, statistical messages receive higher ratings of appropriateness, effectiveness, reliability, knowledgeability, credibility, and thoroughness than narrative messages (Kopfman et al., 1998). This indicates that some component of cognitively processing the statistical evidence leads to perceptions of greater credibility of the message. This may be a result of statistics increasing the verifiability of information (Ah Yun & Massi, 2000) and presenting the reader with an increased sample size (Baesler & Burgoon, 1994).

Arguments can create both cognition and emotions, and it is the combination of these two things that optimizes our social judgment (Kaplan, 1991; Kaplan, 1981). In other words, both are competent sources of information that interact to create a particular social judgment. If so, then it

is extremely important to consider how they react with one another to create the ultimate judgment. Kaplan (1991) suggests:

Social Judgments are affected by multiple determinants. Several cognitions and one or more affective states may jointly affect a single judgment Asking how affective and cognitive information are integrated leads to the interesting possibility that moods and emotions are processed differently, though both can still be considered as sources of information and thus posses weight and scale (p. 81).

The difference in narratives and statistics is extended by Bruner's (1986) view that evidence is paradigmatic and/or narrative. The paradigmatic way of knowing involves systematic logical reasoning. This perspective lends itself to statistical evidence. Alternatively, the narrative shapes reality through focusing on action and detail rather than categorizing systematically. "*Both paradigmatic and narrative ways of knowing are necessary to develop an understanding of the world, and each provides a distinctive way of ordering experiences and constructing reality. Neither is inherently more valid than the other*" (Kreuter, 2007, p. 779, italics mine). In this sense, Kreuter (2007) and Bruner (1986) argue that there are fundamental differences in the two main types of evidence as well as a possible need for an engaging compliment of the two evidence types.

Evidence and Persuasion

Over 2,000 years ago the Greek philosopher Aristotle argued that there were three basic ways to persuade an audience - ethos (the author's character or image), logos (logical arguments), and pathos (the emotions of the audience) (Braet, 1992). Cathcart published the first academic article on persuasiveness of evidence in 1955. "*An experimental study of the relative effectiveness of four methods of presenting evidence*" involves a study in which Cathcart argues for capital punishment to several groups of students. The control group included no evidence. For the second speech, Cathcart supported 90 percent of his claims with evidence but did not mention sources. In the third speech, he gave sources by name only, and, in his forth speech, he included the sources as well as the sources' qualifications. The last three speeches were reported to be significantly more persuasive than the first speech. This seminal finding suggested that evidence affects persuasion and this conclusion has been supported up by numerous studies since (see Reinard, 1988). Research also suggests that the mere existence of evidence is necessary but

not sufficient, and the quality of evidence is an important component of persuasion (Allen & Burrell, 1992). With this in mind, the qualities that differentiate narrative from statistical evidence may also create different outcomes, and more so, combining them (perhaps at different degrees) may create additional/different effects.

The Case for the Persuasive Advantage of Narratives

Numerous studies have found narrative evidence to be more persuasive than statistical evidence. Reinard's (1988) review of research on the persuasive effects of evidence revealed significant support for narrative persuasiveness, especially in courtroom settings. Reinard (1988, p. 26, italics mine) remarks that while "*statistics have been respected in Western culture almost as icons of objectivity,*" his review of 50 years of research in the area found little evidence backing up a persuasive advantage for statistics.

Nisbett et al. (1976) indicated that evidence has a different effect for different audience types. Specifically, they suggested evidence the scientific community finds compelling is not necessarily persuasive to a lay audience. *"We believe that the present research and examples drawn from every-day life show that some kinds of information that the scientist regards as highly pertinent and logically compelling are habitually ignored by people. Other kinds of information, logically much weaker, trigger strong inferences and action tendencies"* (p. 133, italics mine). Other kinds of information, such as specific instances and stories, can actually have a greater, often unexplained persuasive effect. This is especially true when the information is considered to be relevant to the situation under discussion.

Studies finding narratives more persuasive than statistics point to reasons such as vividness, perceived representativeness, and ease of recall to explain this advantage. First, narratives are more vivid in nature, which may enhance their persuasive benefit. Nisbett and Ross (1980) discuss support for the persuasive effects of narratives over statistics and suggest this may be due to the inherently vivid nature of narratives. And although Taylor and Thompson (1982) found that in six out of seven studies, case history presentation (narratives) was more persuasive than statistics; they found little conclusive support for the vividness effect. Yet, other studies have found stronger support for a vividness effect. Sherer and Rogers (1984) found that anecdotal evidence was more effective than statistical evidence when supporting the claim that by drinking less people avoid certain dramatic consequences. This was especially true when the

anecdotes were more vivid. The anecdotal evidence told the story of two drinkers while the statistical evidence used numbers about 200 problem drinkers to back up the claim.

This vivid nature of narratives is in close association with greater perceptions of representativeness than statistics. For example, people will call less probable events (flood in CA) more likely to occur than other events (flood in U.S.) if they are given details (due to an earthquake), which makes the events more available for them to imagine (Kahneman & Tversky, 1972). Nisbett and Borgida (1975) found that when given an extreme case (narrative) example people are just as likely to infer others behaved this way even when they know the behavior was atypical. They also found that people transfer the extreme behavior to entire populations when provided a sample of just a few people acting in that way. This lends support to Kahneman and Tversky's (1972, 1973) assertion that people fail to use available statistical breakdowns when predicting whether or not an individual is part of a group. They state that instead of breaking down information cognitively people sometimes rely on outside cues or heuristics to make decisions. In this case, the representative heuristic leads people to believe something is more representative than it actually is. Brosius (2000) explained that exemplars in the news are often more persuasive than statistics because they are more engaging and taken as more representative. Exemplars are short verbal or visual quotations used to demonstrate a situation and fall closely in line with the definition of a narrative.

In 1982, Dickson conducted a study comparing the persuasiveness of anecdotal and statistical evidence in relation to the reliability of a certain brand of refrigerator. The anecdotal group received testimonials from four housewives who had no troubles with the refrigerator and one who experienced difficulties. The statistical group was told that 395 housewives reported no problem while 105 housewives had difficulties. Note both groups have a breakdown occurrence of around 20 percent. Yet, when the asked about breakdown rate, the statistical group reported close to the actual number (20 percent breakdowns) while those having heard the anecdotal report estimated a higher breakdown rate. Hoeken (2005) used this study to illustrate that statistical evidence is more persuasive because that group reported realistic numbers. However, this could easily be interpreted to the contrary. One housewife with difficulties created a larger persuasive effect. Individuals in that group perceived *more* (or a higher percentage) of difficulty than the statistical group. Although Dickinson might conclude that statistics provide more accurate recall of numeric distribution, it is a stretch to assume that accurately recalling a percent

is more persuasive. Thus, this study could be interpreted as the narrative of the one housewife being the most persuasive as it pulled participants away from the statistical breakdown rate to imagine her difficulties as more common than they actually were.

Better recall, especially over a longer period of time, is another advantage of narrative over statistical evidence. Kazoleas (1993) found people who heard narratives were more likely to recall the information after a significant amount of time has passed and their attitude change was more persistent over time. While this study indicated that narrative evidence has an enduring effect, it showed no significant difference in initial persuasion between the anecdotal and statistical evidence. At the time of the initial survey, those hearing a story about how a seatbelt-prevented injury reported the same attitude as those who heard the statistic that people are 50 percent less likely to be injured when wearing a seat belt.

Koballa (1986) found that anecdotes were more persuasive than statistical evidence when trying to persuade teachers to supplement traditional science curriculums with new programs. Anecdotes, in the form of a testimonial of a participant in the new program, resulted in higher initial attitude change, and the anecdotal evidence group's attitude change was significantly more effective as time passed. As similarly noted later by Kazoleas (1993), anecdotes indeed create a sustained effect and allow for easier recall over time whereas statistics fade.

These factors (increased vividness, increased perceptions of representativeness, and greater recall over time) could all be indicators of a larger function of narrative evidence - its ability to increase affective reactions in general and specifically the feelings of narrative involvement with the message. This feeling of narrative involvement with the message is often referred to as absorption or transportation. The attitude and behavior change created by persuasive pro-social messages in narrative television and radio programming is "*attributed to audience members' engagement with the characters of the show and absorption into the plot,*" (Stitt & Nabi, 2005, p. 5, italics mine). Furthermore, absorption into the plot of a narrative is defined by Slater and Rounder as "*vicariously experiencing the characters' emotions and personality,*" (2002, p. 178, italics mine) and is shown to increase persuasion. The Stitt and Nabi (2005) study showed that narrative evidence increased transportation or absorption into the message. Additionally, absorption increased affective responses, reduced counterarguing (a sign of cognitive processing) and led to more story-consistent beliefs (indicating persuasion). The vividness of messages also likely enhances absorption into that message. Additionally, subjects

may exaggerate the representativeness of a narrative (e.g., Dickinson, 1982) and better recall narratives over a period of time because of the personal connection made (e.g., Kazoleas, 1993; Koballa, 1986).

Narrative involvement helps explain the results of many studies favoring narrative persuasiveness over statistics. Morgan, Cole, Shuttman, and Piercy (2002) found evidence for narratives as more persuasive than statistics in safety messages when narratives included fear appeals. They suggest recipients identified more with the characters in the narratives than they did with non-personal statistics. Nisbett et al. (1976) noted that waiting lines for cancer screening skyrocketed when Mrs. Ford and Mrs. Rockefeller received mastectomies as people connected more with the personal cancer experiences of the two public figures than with doctors' statistics about the risk of cancer.

Borgodia and Nisbett (1977) found that students experienced little or no persuasion about a decision to take a course from a particular instructor based solely on statistical reports of the teacher's evaluations. However, students who received face-to-face feedback from past students (anecdotes) increasingly based their decision to take a course from a particular instructor on those comments. This study has been criticized because different mediums were used for the two evidence types, however it clearly shows how a connection with another student can be more persuasive than detached statistics about student responses.

In summation, narrative evidence is naturally more vivid. And this vividness likely enhances absorption into the message. Additionally, the vividness and absorption may also allow for subjects to exaggerate the representativeness of a narrative and better recall narratives over a period of time. Furthermore, narratives create more total affective reactions. Given the considerable benefits of narrative evidence, the following hypothesis is suggested:

H1: Messages containing higher ratios of narrative evidence will be rated significantly higher in perceptions of narrative involvement with the message than messages containing higher ratios of statistical evidence.

However, literature on the relative persuasiveness of narratives versus statistics is far from unanimous. In 1994, Baesler and Burgoon tested the effect of vivid story, non-vivid story, vivid statistical and non-vivid statistical evidence on belief change regarding juvenile delinquents becoming adult criminals. Attitude was measured at three different time periods – immediately, 48 hours later, and one week later. Story evidence (both types) was not persuasive

for either of the delayed periods (48 hours or a week later). However, both vivid and non-vivid statistical evidence was persuasive at 48 hours and this effect was extended to one week for the vivid statistical evidence. Although this suggests that statistical evidence is more persuasive over time than narratives when vividness is kept in constant, the authors note, *"an issue unresolved in the persuasion and argumentation literature is the type of evidence that is most likely to bolster beliefs in a claim: statistical evidence or report evidence of a story or case variety"* (p. 582, italics mine). Additionally, it is likely that this study is removed from real world situations, as narratives tend to be more inherently vivid. Still, many authors have argued more decisively that statistics are actually the more persuasive of the two evidence forms.

The Case for the Persuasive Advantage of Statistics

Notwithstanding the support for narrative evidence, statistical evidence is believed to be extremely persuasive because it provides a large sample size, bolsters perceptions of believability and credibility, and fairs better when supporting general claims.

By definition, statistics represent a larger sample size of subjects than narratives. This often provides a logical reason for message recipients to prefer statistics. This effect is well supported in a number of studies. For example, Hoken (2001a) examined the persuasive difference between evidence types when trying to assure audiences about the likely success of a new cultural center. The anecdotal group reviewed a story about the success of a similar center in another town, whereas, the statistical group reviewed a report about the success of 27 different cultural centers. The statistical group reported higher levels of persuasion. Researchers attributed this to the increased confidence that occurs with providing 27 samples rather than just one.

Increased believability (or credibility) is another factor cited for the persuasive advantage of statistics. Perceived source credibility has a positive impact on persuasion (Nan, 2007; Hovland & Weiss, 1951; Kelman & Hovland, 1953: Warren, 1969). Source credibility is commonly defined as a message source's ability or motivation to provide accurate and truthful information (Kelman & Hovland, 1953). In 1996, Slater and Rouner found statistical evidence more persuasive and suggested recipients perceive statistics as more likely to represent the truth and more believable in general. However, the results of their study were more nuanced than just increased believability with statistics. When subjects agreed with the message's position, they rated statistical evidence as better written. However, statistical evidence had no effect when the

subjects opposed the position. Instead, subjects who disagreed with the message's position rated the narrative evidence as more believable, more persuasive and slightly better written. While this study illustrates statistics as more persuasive on average, it also provides a great deal of support for the claim that evidence types function differently. Perhaps statistics are more believable when the audience is predisposed to agree with the position, but if the target is predisposed to disagree with the argument, narratives will be more persuasive. In this case, absorption may be interacting with positionality and limiting counterarguing, which would allow narratives to have the persuasive advantage.

In 2008, Hornikx conducted a study where participants ranked four types of evidence (statistics, expert, causal, anecdotal) for their expected persuasiveness. Subjects reported they expected statistical evidence as the most persuasive. Expert evidence was rated as next in persuasiveness, then causal evidence, and lastly anecdotal evidence. Hornikx also found participant expectations of persuasive strength to be consistent with the persuasive effect of the relative evidence types. Aside from the fact this study suggests that people rate statistics as more credible, it also suggests that regardless of the message, subjects will report persuasive outcomes consistent to prior attitudes about evidence type.

Credibility is directly related to the perception that statistics are higher in information value. In a study comparing statistics, narrative, and self-assessment to communicate about tanning being a risky behavior, the statistical evidence was reported higher on the value of information provided (Greene, 2003). The statistics condition also decreased participants' intentions to tan and actual tanning behavior. Additionally, the statistics condition effectively increased thoughts of risk perceptions such as susceptibility to skin cancer. Although narrative evidence did not increase risk perceptions, it decreased intentions to tan and (unlike statistics) increased the perceptions of realism. This indicates that while both narratives and statistics are persuasive, statistics are more effective at changing risky behavior.

As previously noted, statistics are also more effective with supporting general claims. Hoeken and Hustinx (2006) found that when the claim is general (i.e., people should quit smoking or drink less), statistical evidence was the most persuasive in convincing subjects to accept the claim. A general claim consists of a claim of a large number of unspecified entities. However, anecdotal evidence was suggested to be just as effective at convincing subjects to accept a claim if the claim was more specific (i.e., buy a Volkswagen Beetle) and if the situation

in the anecdote was considered to be sufficiently similar to the situation in the claim. In instances when the anecdotal evidence was dissimilar to the situation, statistics were more persuasive, even when working to prove a highly specific claim. Statistics perform better when supporting a general claim because the receiver is not likely to connect (or need to connect) with the message emotionally. For example, if a particular claim will not affect them on a personal level.

As noted, anecdotes are stronger when supporting specific claims (Hoeken & Hustinx, 2006; Hornikx, 2007). Additionally, anecdotal evidence serves as a persuasive counter example to a general claim by suggesting that the claim may not be true all the time. In this sense, narratives serve as very effective support for a refutational claim. Hornikx (2007) recognizes the persuasiveness of anecdotes but insists statistics are more persuasive overall and in general. He explained the discrepancy between contradictory findings about the relative persuasiveness of statistical and anecdotal evidence was related to flaws in the methodological design of studies.

To begin, Hornikx (2007) argues that several studies were designed to privilege anecdotes. For one, he suggests that ordering effects may have played a role as anecdotal evidence was often presented after statistical evidence, creating a potential recency effect (rather than a pure persuasive effect). In addition, he suggests that anecdotes often are more vivid than statistics in studies, and this affects survey recall (but may not suggest persuasive capability). Thirdly, he notes the anecdotes used in studies were often more causal in nature than the statistics (and casualness may impact receptiveness). Thus, they might have been chosen because they better explained why something occurred, not because they were anecdotal. Finally, classic studies often argued more specific claims rather than general ones –which have been shown to favor anecdotal evidence (e.g., Hoeken & Hustinx, 2006). Hornikx points to a study that examines the implementation of a comprehensive exam and its relationship to increased salaries. The specific claim suggests, "A comprehensive exam at a specific school will raise salaries." And the more general one claims "Students who pass comprehensive tests will have higher average salaries." The first claim (the specific claim) has been shown to favor anecdotal evidence. The second claim (the general claim) favors statistics.

These explanations provide support for the 2005 review Hornikx produced for the relative persuasiveness of anecdotal, statistical, causal and expert evidence. This review examined fourteen studies on argument type and persuasiveness. After accounting for variances

due to differences in definitions and operationalisations, Hornikx argues statistical and causal evidence is more persuasive than anecdotes for reasons such as greater sample size and credibility.

The comparison studies had to meet six criteria, including utilizing definitions consistent with Rieke and Sillars (1984). The results appear below. However, it should be noted that three studies (Dickson, 1982; Kazoleas, 1993; Sherer & Rogers, 1984) have been classified differently in this literature review than Hornikx classified them in his review. In these cases, the results of the studies were found to favor anecdotes over statistics despite Hornikx interpreting them as otherwise.

Table 2.1 Hornikx's Classification of Previous Studies

Result	Reference
statistical> anecdotal	Allen et al. (2000)
	Baesler & Burgoon (1994)
	Dickson (1982)
	Hoeken (2001a)
	Hoeken & Hustinx (2003)
	Slater & Rouner (1996)
statistical = anecdotal	Baesler (1997)
	Cox & Cox (2001)
	Hoeken (2001b)
	Kazoleas (1993)
	Sherer & Rogers (1984)
anecdotal> statistical	Koballa (1986)

Allen and Preiss' (1997) meta-analysis compared the persuasiveness of narratives and statistical evidence. Like Hornikx, their examination (of 15 studies) concluded that statistical data is more persuasive than anecdotal data. However, Allen and Preiss also suggest a combination of evidence types may ultimately be the most effective and recommend further research in the area.

Hornikx (2007) also calls for additional research to compare the persuasive effect of statistical and anecdotal evidence when providing incongruent evidence (for example, anecdote says X and statistic says opposite of X) and while controlling for order and evidence vividness. It may be the case that narratives are inherently more vivid but since order has not been controlled,

it is necessary to test for this effect. Clearly, there are still some areas for further exploration in the area of evidence type and persuasiveness.

However, research has argued that statistical evidence can be extremely persuasive, especially when supporting general claims. Additionally, statistical evidence performs well because it represents a larger number of instances than narratives. Furthermore, statistical evidence increases perceptions of valuable information as well as believability, both major components of credibility.

Statistics lends itself to increased cognitive processing. Recognizing the value of a large sample size instead of inflating representativeness indicates more cognitive break down of the information. Reynolds and Reynolds (2002) argue that evidence must be recognized, cognitively processed, and judged as legitimate in order to maximize persuasion. They also call for more research on argument type affecting this process but conclude "*on balance, statistical evidence would seem to be the more persuasive form of evidence when compared to narrative evidence*" (p. 431, italics mine).

Increased perception of credibility also points to cognitive processing. Source credibility is suggested to be a combination of the source's perceived competence about a particular topic and the source's perceived trustworthiness (Hovland & Weiss, 1951). Statistics increase the verifiability of information, which increases perceptions of credibility (Ah Yun & Massi, 2000). Additionally, research has shown that "*the psychological mechanism through which perceived source credibility influences is complex and could involve an indirect effect via cognitions*" (Nan, 2007, p. 8, italics mine). For example, Chaiken and Maheswaran (1994) found that perceptions of source credibility affect cognition about a message, with more positive cognitions related to sources perceived to be more credible. Thus, given this reasoning, targets of a message will perceive the source using statistical evidence as potentially more credibility and therefore, hypothesis 2 follows:

H2: Messages containing higher ratios of statistical evidence will be rated significantly higher participants' perception of message credibility than messages containing higher ratios of narrative evidence.

To complicate matters further, and as some of the previous studies have alluded, a separate set of studies have found statistics and narrative to be equal in their persuasive effect (e.g., Iyengar & Kinder, 1987; Nadler, 1983).

No Clear Advantage

In 1997, Baesler conducted a study in which no persuasive advantage was found for statistical or narrative evidence. In the study, 100 undergraduate students were given an attitude measure before and after reading three stories for submission into the newspaper. Half the group received three statistical-based stories and the other half received three narrative-based stories. Both evidence types were successful in creating opinion change in one of the three areas (a successful opinion change occurred with the crime story but did not occur with the internship or birth control stories). However, neither evidence type was shown to be more persuasive than the other with any statistical significance. Therefore supporting a set of claims about crime creates a greater likelihood of persuasion than supporting a set of claims about internships or birth control. Perhaps the real conclusion here is about the effect of topic type rather than evidence type.

Baesler (1997) included the exploratory variables of personalness and scientificness in one evidence type study. He found that participants rated narratives high in personalness but low in scientificness. Surprisingly, statistics were rated as moderate in both areas. However, neither of these measures was related to persuasion with any statistic significance. Baesler (1997) also found there was no difference in unfavorable cognitive responses (i.e., counterarguing) between the two evidence types.

Hoeken (2001b) conducted a study about raising taxes to install more streetlights on sidewalks. Results indicated the two evidence types were equally effective. Participants in the statistical group were told that in 48 other towns increasing streetlights reduced the number of burglaries by an average of 42 percent. The anecdotal group was told about a single town, perceived to be similar to their own, that added more streetlights and decreased burglaries by 42 percent.

Cox and Cox (2001) conducted a study in which no persuasive benefit was found for either evidence type. In the study, female participants were given information about the benefits of regular screening mammograms. In the statistical evidence, an early treatment was said to reduce the risk of dying from breast cancer by 30%. The anecdotal evidence was the story of a

woman who likely would have died if her breast cancer had not been caught early on in a mammogram screening. This study found statistical and anecdotal evidence to be equally persuasive.

Baesler (1997), as well as Cox and Cox (2001) and Hoeken, (2001b) suggest that anecdotal evidence is as persuasive as statistics (and statistical evidence as persuasive as anecdotes). Although evidence types may differ in terms of the advantages they provide or functions they serve (e.g., personalness, scientificness, source credibility, information value, narrative involvement, etc.), there is certainly sufficient reason to suggest both evidence types are equally persuasive.

Combining the Evidence Types

The previously mentioned studies compare messages using one type of evidence (statistics) to those using another type of evidence (narratives/anecdotes). In most of these studies, they pit—and evaluate—evidence types against each other. Yet, the use of evidence does not have to be (and often may not be) mutually exclusive. In fact, a communicator could easily utilize both narratives and statistics in the same message (Allen & Presiss, 1997).

At present, few studies combine statistical and narrative evidence (Kreuter, 2007; Kopfman et al., 1998). However, a number of researchers have called for the examination of a combined effect (e.g., Allen & Preiss, 1997; Kreuter, 2007; Kopfman, 1998; Reynolds & Reynolds 2002). Hornikx and Houët (2009) presented the results of one of the first studies to combine anecdotal and statistical evidence. Normatively strong anecdotal (narrative) evidence and normatively weak anecdotal evidence was presented to residents of a Dutch city in support of a proposed environmental regulation. In half of the cases, the narrative evidence (normatively weak or strong) was paired with statistical evidence. Results showed that persuasion only occurred when the narratives were combined with statistics (rather than with anecdotal evidence alone) and the persuasion was greater in the strong anecdotal + statistics situation than it was in the weak anecdotal + statistics situation. Therefore, the results of this study suggest that in order for persuasion to occur, recipients needed some degree of statistical support. However, the researchers did not test a statistics alone condition. Therefore, it is not clear if statistics acting alone would have been persuasive or if it was a combination of statistics with anecdotes that

created the persuasive effect. In the end, researchers could only conclude that statistics should be combined with strong anecdotal evidence to be persuasive.

Allen et al. (2000) also combined narrative and statistical evidence. Subjects received messages and then ranked the credibility of the speaker and their level of agreement with the messages conclusions. Fifteen different messages were presented and each message had four versions (i.e., 60 total messages). One version lacked any statistical or narrative evidence, one contained statistical evidence support only, one contained narrative evidence support only, and one contained both statistical and narrative support. Each participant received one version of one message. This study found that messages combining narrative and statistical information were significantly more persuasive than those using narratives or statistics alone. The statistics only condition was the next highest in persuasiveness, then narrative only and lastly the no evidence condition.

Allen et al. (2000) recognizes the need for an inclusive theory explaining theses results. "*One issue still unresolved in the literature is the nature of cognitive processing that persons use that explains the findings. The conclusion is that statistical evidence is more persuasive than narrative proof but that the forms when combined are more effective. However, the conclusion offers little in the manner of explanation or understanding about why the particular effects are generated*" (p. 335, italics mine).

Rationale for Research Question

Narrative evidence is suggested to be more persuasive than statistics because it is more naturally vivid (Nisbett & Ross, 1980; Sherer & Rogers, 1984), increases perceptions of representativeness (Hoeken, 2005; Nisbett & Borgida, 1975) and is easier to recall, especially after extended periods of time (Kazoleas, 1993). Additionally, narrative evidence produces more overall affective reactions (Kopfman et al., 1998) than statistics and increases absorption into the message (Stitt & Nabi, 2005).

 Conversely, some researchers argue the statistical evidence is more persuasive than narratives because it is representative of a larger sample size (Hoeken, 2001a) and increases perceptions of believability and source credibility (Hornikx, 2008; Slater & Rouner, 1996). Moreover, statistical evidence tends to particularly outperform narrative evidence when working to support a general claim (Hoeken and Hustinx, 2006).

These findings suggest that narratives and statistics function to persuade in different ways. Absorption into narratives increases affective responses, reduces counterarguing (a sign of cognitive processing) and leads to more story-consistent beliefs (indicating persuasion). Alternatively, when looking at evidence for a more general claim, recipients are less likely to get connected and more apt to process cognitively rather than affectively. In these cases, the increased sample size and perceived believability of statistics garner superior persuasion. From this, this study offers two hypotheses. First, messages containing higher ratios of narrative evidence will be rated significantly higher in participants' perceptions of narrative involvement than messages containing higher ratios of statistical evidence. Second, messages containing higher ratios of statistical evidence will be rated significantly higher in participants' perception of message credibility than messages containing higher ratios of narrative evidence. Both hypotheses will be tested to determine if evidence types indeed function differently and thus create different perceptions for listeners.

While numerous studies have called for it, little research has tested the effect of combining evidence types. However, an early study on combining narrative and statistical information (Allen et al., 2000) found a mixture of the two evidence types was more persuasive than statistics or anecdotes alone. Moreover, Hornikx and Houët (2009) found that anecdotes are more persuasive when combined with statistics. Taken together, there is reason to suggest that evidence types have different, perhaps non-competing roles and recipients garner persuasive benefits from both evidence types (perhaps exponential benefits) when combined. This is helpful in gauging how communicators can utilize evidence to maximize persuasion. However, with both studies, there were limitations. The Allen team only tested an equal degree of statistics and anecdotes (50/50) and Hornikx and Houët combined a small amount of statistics with strong and weak anecdotes.

Therefore, the next logical step is an examination of claims utilizing varying levels or ratios of narrative and statistical evidence. Maximum persuasion may exist with a particular combination of evidence support. Thus it makes sense to test different blends to see if a point of maximum persuasion truly exists. Given that both narratives and statistics are reported to be more persuasive than the other, and that a combination including both types produce the most persuasive outcome, a question of proportion comes to mind. In other words, what is the appropriate balance, and should it be even (as Allen et al. suggest) or should narrative be

weighted heavier (as Hornikx and Houët suggest). Therefore, the goal of this study is to test the persuasive effect of each evidence type as well as to extend what is known about combining both evidence types by testing different blends. Thus, to begin, this study will examine ratios of evidence at 100/0, 75/25, 50/50, 25/75 and 0/100 percent blends of narratives and statistics (respectively). This should indicate if particular blends are more effective when weighted heavier towards narratives or statistics. Are types of evidence equality important, or is one type more important? Given this uncertainty, the following research question will be pursued:

RQ1: What is the most persuasive ratio of levels of narrative and statistical evidence?

CHAPTER 3 - Method

Context

Almost 97% of Americans consume meat (Staher, 2006). Yet, according to the United States Department of Agriculture, less than 2 percent of Americans are involved in the early stages of food production (i.e., farming or livestock production). Although it is likely that there is a small percentage of people not involved in farming or ranching who have some kind of understanding of production agriculture, it is more likely that most of the consumers know very little about the processes involved in the safety and welfare of food animals. Given the potential lack of knowledge about livestock production, messages from the beef industry may be helpful to these consumers regarding the food they are consuming.

Online newspaper letters to the editor, drafted by a livestock producer, served as the messages for this study. These messages are of interest because the livestock industry relies on its communication messages to comfort and ultimately persuade its stakeholders (e.g., the meat consumers). The livestock industry wants to remind the consumer that it is acceptable to consume meat. On the other hand, consumers want assurance that the processes involved with their food are at least safe and additionally humane.

Sample

The sample for this study involved a national sample of meat consumers. This study encompassed a total of 384 usable subjects. A large national sampling company, Survey Sampling International (SSI), was utilized to collect data. Collection was controlled to ensure equal representation across a number of important demographics. An equal number of male and female respondents, as well as varied ethnicities were gathered to provide a respondent pool representative of the gender and ethnic backgrounds in the United States. Additionally, respondents were distributed across seven age groups (18-24, 25-35, 36-45, 46-55, 56-65, 66-75 and 76+) with each age group accounting for between 11.1 and 18.3 percent of the responses. Income level was also controlled to ensure respondents were dispersed through the income makeup in the United States. Also of interest to this study was the geography of the respondents. Collection was controlled to provide at least 20 percent of the respondents in each category of

the three breakdowns of where people *grew up* - in a rural, suburban or urban environment. On top of this, the 20 percent minimum was also maintained for where the respondents *live now* - in a rural, suburban or urban environment. Geography could be significant because agriculture production tends to be a rural activity. A person's opinions of the agriculture industry may vary based on their proximity to production agriculture, either in where they live now or their exposure growing up.

The respondent pool was reduced to eliminate high issue involved subjects. Participants consisted of meat-eaters who reported they are not heavily involved in the livestock production/agriculture industry. Including people highly involved in livestock production would have run the risk of confounding the results. More specifically, it is likely this group already feels comfortable and will view any source of evidence for this message just as positively as any other source of evidence. Furthermore, vegans and vegetarians were excluded from the sample because they would be strongly predisposed to respond negatively to the message so no source of evidence would likely be viewed as any better than any other source of evidence. To control for this, a couple of qualifying questions were included to account for issue involvement (i.e., the agriculture industry and non-meat eaters). Participants were asked (on a 10-point likert scale with 10 being very familiar) how familiar or involved they are in the livestock/agriculture industry. Participants reporting 9 or 10 were removed from the analysis. Additionally, an eating habits question asked participants to classify themselves as a meat-eater, a vegetarian or a vegan. Participants who selected vegetarian or vegan for their eating habits were removed from the study. By eliminating high-involved and hostile subjects, it is less likely that issue involvement played a role in confounding the results of this experiment.

Independent Variable

Five different conditions served as the independent variable. Each condition represented a different degree, or blend, of narrative and statistical evidence. Each blend supported the same claim that "farmers and ranchers care about the welfare of their animals." Participants were randomly assigned to a condition, and each condition received approximately the same number of participants. The following is the breakdown of the evidence blends and sample sizes of the five conditions.

100% narrative, 0% statistics; n=75

75% narrative, 25% statistics; n=82

50% narrative, 50% statistics; n=66

25% narrative, 75% statistics; n= 85

0% narrative, 100% statistics; n=76

Stimulus Materials

A letter to the editor served as the message framework, which remained consistent across all experimental trials. Letters contained the same general claims but differed in respect to the blend of evidence types they contained. Each letter included four pieces of evidence supporting the claim "farmers and ranchers care about the welfare of their animals." See appendix G for the letter to the editor template. Evidence drawn from a pool of five pieces of statistical evidence and five pieces of narrative evidence. Evidence was randomly drawn from each pool (See appendices E and F). Below is a table indicating the number of narrative and statistical evidence pieces that were included in each of the blends.

Table 3.1 Evidence Blends

BLEND	# OF NARRATIVE EVIDENCE PIECES	# OF STATISTICAL EVIDENCE PIECES
100% Narrative	4	0
75% Narrative, 25% Statistics	3	1
50% Narrative, 50% Statistics	2	2
25% Narrative, 75% Statistics	1	3
100% Statistics	0	4

Once selected, evidence pieces were inserted into the letter to the editor framework (see appendix G). The order of the evidence within the letter to the editor was varied randomly to control for a potential primacy or recency ordering affects.

Manipulation Check

For the experiment to be considered convincing, and for the evidence to function as conceptualized in the literature, it was critical that the evidence included in the conditions were perceived as inherently statistical or narrative. To ensure that all statistical evidence was perceived as a statistic and that all narrative evidence was perceived as a narrative, *and* that the

statistics and the narratives were viewed as wholly different, several manipulation checks were performed prior to conducting the actual experiment.

For the final manipulation check, 64 undergraduate students enrolled in public speaking classes at a Midwestern university read a total of twelve evidence pieces and responded to five seven-point semantic differential scales for each piece of evidence. Subjects rated all twelve evidence pieces using the same scales. Two of the scales were developed by the researcher to measure "statisticalness," These items asked subjects to indicate on a seven-point scale if the evidence was "very scientific" to "not very scientific" as well as "based on numeric data" to "not based on numeric data." Three of the scales measured "narrativeness" and were based on a scale developed by Busselle and Bilandzic (2008). These items asked subjects to indicate on a seven point scales if they could "see this clearly in my mind" or "hear this clearly in my mind" and it "the setting clear in my mind." Moreover, this check also indicated the two evidence types are different from one another as narrative evidence pieces were perceived as lower than statistical evidence in "scientificness" and "based on numeric data" but higher in the areas of "see clearly in my mind," "hear clearly in my mind" and "the setting is clear in my mind." Of the twelve initial evidence pieces, only 10 evidences pieces (5 of each) met the statistical and narrative criteria and were therefore selected for the study.

Dependent Variables

Source Credibility Scale. The credibility of the message source was measured using a 6-item scale developed by Allen et al. (2000). The items asked participants to think about the extent to which they believed the letter writer was competent and trustworthy and then rate their responses using a 5-point Likert scale (1=*strongly disagree; 5=strongly agree*). The scale measured such as items as the reader finding the writer sincere, believable and dishonest. The credibility scale received a Cronbach's alpha reliability rating of .909 and a factor analysis revealed that all of the factors loaded on one component.

Narrative Involvement. Narrative Involvement was measured using a six-item scale utilized by Busselle and Bilandzic (2008). Narrative involvement is concerned with absorption or transportation into a message and "*vicariously experiencing the characters' emotions and personality,*" (Slater & Rounder, 2002, p. 178, italics mine). The scale included measures such as the reader being pulled in to the message and rating that the reading experience was intense for

them. The narrative involvement scale received a Cornbach's alpha reliability rating of .897 and a factor analysis revealed that all of the factors loaded on one component.

Attitude Change Scale. Attitude change for the message, also referred to as persuasion, was measured using a slightly modified version of the 5-item scale developed by Allen et al. (2000). The scale asked participants to think about the extent to which they believed the letter conclusions and then rate their responses using a 5-point Likert scale (1=*strongly disagree;* 5=*strongly agree*). The scale contained questions about accepting the writer's conclusion and if the reader's opinion was consistent with the writer's message. The attitude scale received a Cornbach's alpha reliability rating of .889, and a factor analysis revealed that all of the factors loaded on one component.

Procedure

The survey company, SSI, contacted all of the participants and invited them to participate in this study. In the message, participants were provided a link directing them to an online survey. The survey randomly assigned each participant to a condition that contained one of the five evidence blends. Within each condition, a computer also randomly assigned evidence to the condition. For example, if Sue received the 50/50 condition, she might receive narrative evidence A and B as well as statistic evidence D and E. Similarly, if Joe received the 50/50 condition, he might receive narrative evidence B and E as well as statistic evidence A and C.

Each participant read his or her message (containing a blend of evidence ranging from 100% to 0% of each evidence type) in the form of a letter to the editor. Following the letter, participants completed three scales—the narrative involvement, the credibility and the attitude change (persuasion) scales. Once the collection numbers slowed to less than one a day, SSI closed the survey and sent the results to the researcher for analysis.

Data Analysis

SPSS was used to test both hypotheses and the research question. The results for the three dependent variables (credibility, narrative involvement and attitude) were tested separately using analysis of variance (ANOVA). ANOVA tests were run for statistically significant variance between the five-narrative/statistic blend groups for the variables of credibility, narrative

involvement and attitude. In addition to analyses of variance conducted, a series of post hoc tests were run to determine if differences existed among demographic variables of interest.

CHAPTER 4 - Results

This study examined the effectiveness of narrative and statistical evidence in persuasion. Two hypotheses and one research question were presented in order to better understand how the two evidence types (narrative and statistic) separately and blended together at different levels affected (1) perceptions of narrative involvement, (2) perceptions of credibility and (3) overall persuasion.

Hypothesis 1

Hypothesis 1 predicted that *messages containing higher ratios of narrative evidence will be rated significantly higher in perceptions of narrative involvement with the message than messages containing higher ratios of statistical evidence.* To test this hypothesis, an ANOVA between condition (different percentage blends of narratives and statistics) and narrative involvement was performed. The results did not yield a significant main effect for narrative involvement and the five conditions, $F (4, 384) = .605, p = .659.$ Despite the prediction that the conditions containing more narrative evidence would create more narrative involvement in the message, this effect did not occur. Therefore, hypothesis 1 was not supported, which suggests that participants were not any more involved in the narrative evidence than they were in the statistical evidence.

Hypothesis 2

Hypothesis 2 posited that *messages containing higher ratios of statistical evidence will be rated significantly higher in the participants' perception of message credibility than messages containing higher ratios of narrative evidence.* To test this hypothesis, an ANOVA analysis for variance between condition (different percentage blends of narratives and statistics) and credibility rating was performed. The results did not reveal a significant main effect for source credibility and the five conditions $F (4, 384) = .861, p = .488.$ Hypothesis 2 was not supported, indicating that participants did not find that using statistical evidence to support animal welfare claims to be any more credible than using anecdotal support. However, an analysis of the means revealed that overall, participants rated the credibility of the source (livestock producer) quite high (M= 3.939).

Research Question

The central research question of this study was interested in determining which evidence blend was the most persuasive. Specifically, it asked, w*hat is the most persuasive ratio of levels of narrative and statistical evidence?* To test this relationship an ANOVA was performed to test for differences between the condition (different percentage blends of narratives and statistics) and the attitude change (persuasion). Results did not indicate a significant main effect $F(4, 383)$ = .810, p = .519. Thus, this study indicates there is no difference in persuasion for using completely narrative, completely statistical or blended version of these evidence types for animal welfare claims. Notably, the persuasive variance for each blend was so small, that it is fair to suggest Americans are not persuaded any more by statistics than they are by narratives, and that a blend of the two evidence types also did not create a greater degree of attitude change (100% Narrative, M = 4.01, SD = .809; 75% Narrative/25% Statistic, M = 3.88, SD = .926; 50% Narrative/50% Statistic, M = 3.81, SD = .90; 25% Narrative/75% Statistic, M = 3.78, SD = .905; 100% Statistic, M = 3.91, SD = .789).

Post Hoc Analysis

Post hoc analyses were conducted to see if a relationship between persuasion and condition existed within particular demographics. To test for interactions, ANOVA analyses were performed to test for differences between the condition (different percentage blends of narratives and statistics), the demographic group (i.e., location, gender, age), and the attitude change (persuasion). Post hoc analyses were run for four different demographic variables – area of the country participant grew up, area of the country the participant lives now, gender and age.

Although no formal hypotheses or research questions were offered in this area, it was of interest to determine if individual demographic differences influence the persuasive effectiveness of evidence blends. Results indicated that there was no significant main effect for the area the participant grew up and the persuasion $F(2, 369)$ = .051, p = .950; nor was there a significant interaction effect for the area the participant grew up, condition and persuasion $F(8, 369)$ = .920, p =. 500. No significant main effect was found for the area the participant lives now and persuasion $F(2, 369)$ = 1.72, p =. 180*;* nor was there significance for where the participant lives now, condition, and persuasion $F(8, 369)$ = .743, p = .653. Similarly gender did not show any main [$F(1, 374)$ = .087, p = .768], or interaction effects [$F(4, 374)$ = .461, p = .658]. Age,

however, did show a significant main effect for persuasion $F(6, 349) = 3.98$, $p =. 001$ with planned comparisons revealing that the 65 and order population is significantly easier to persuade with this topic (livestock welfare and safety) than the 35-45 age group. But, a significant interaction effect for age, condition and persuasion was not found $F(24, 349) = .910$, $p =. 589$ suggesting that evidence types did not create an influencing factor that impacted persuasion. Rather, age alone affects persuasion in this context matter.

Summary of Findings

This study revealed no significant difference for a participant's narrative involvement with narrative versus statistical evidence. Participants became as involved in message supported completely by narrative as they did a message supported completely by statistics (as well as varying blends of the two). This study also suggests there is no significant difference in the perception of source credibility of a message differing in amounts of narrative and statistical evidence. These findings may suggest that evidence may not function as differently as some scholars have previously suggested in all contexts or channels. Moreover, persuasion difference is unaffected by altering the evidence types and ratios. Lastly, the results remain consistent across most demographics when it comes to the persuasion, evidence type or blend, and the variables of geography (grew up and live now), age or gender.

CHAPTER 5 - Discussion

This study sought to determine if one kind of evidence was more persuasive than another. Up until this time, it was not clear if anecdotal evidence was superior to statistical evidence or vice versa. In fact, numerous studies support both sides. Theses studies discuss their findings by suggesting that the type of claim (e.g., general, specific, probability) or topic of persuasion (e.g., crime, internships, tanning) matter. Moreover, research in this area also reveals that statistics and anecdotes serve different functions in persuasive messages. There is a degree of support for the combining of the evidence types to optimize persuasion. Nevertheless, any conclusive findings about which evidence to use, how much of each evidence type to use when blending evidence and even how the evidence types function, was still unclear.

This study revealed that there is no difference in the persuasive ability of anecdotes versus statistics, and also no one particular blend (e.g., 75/25, 50/50, or 25/75) generates more persuasion. Moreover, it found that statistics and narratives might not function as differently as previous considered. This study found that statistics were not perceived as significantly more credible nor were anecdotes more effective at producing a significantly more narratively involved (or connected) participant.

Methodologically, this study was extremely vigilant. It ran several manipulation checks to ensure the evidence included in the design was notably different. Ten different evidence pieces (5 of each) were rotated into the letter to comprise the appropriate blend of the condition each participant received as a guard against any one condition creating design effects. And the sample size neared 400 completed surveys from a national random sample of qualified participants (i.e., not vegan, not vegetarians, and not overly familiar with the livestock industry). And the results conclude: no significant effect in the types of evidence, the blends of types of evidence, or even the functions of the types of evidence. Why?

Theoretical Explanations & Implications

It is possible that the topic of persuasion might be influencing the effects. In the Baesler study (1997), he found that crime stories create a more polarizing difference in target's minds as well as their reactions and perceptions to the claims. Although more research would be needed to

make solid conclusions, it is possible that participants already have an idea of what they believe about the topic of animal welfare and food safety—regardless of the type of support provided. In other words, predetermined dispositions may be influencing results and not message construction (Hornikx, 2008).

It is also possible that the channel of the message may be influencing the results. There is reason to suggest that lean media (e.g., memos, letters, etc.) under the media richness model will not be as persuasively effective or produce as strong of difference between evidence types as a richer media (e.g., face-to-face, commercials, etc.) (Daft & Lengel, 1986). Factors that determine richness include (a) availability of instant feedback, (b) use of multiple verbal and nonverbal cues, (c) use of natural language and (d) the personal focus of the medium. Richer media allows for the ability to increase shared meaning. This may be particularly important when looking at narrative and statistical evidence as persuasion by narratives may depend on some degree of personal connectedness. It is much easier to feel connected to someone with a channel that allows for multiple cues than by reading a letter to the editor, even when the words written in the letter are the same as those spoken on television. The ability to see non-verbal communication cues and even interact creates a connected effect not possible with letters and memos. Years before Daft & Lengel's theory of media richness, Borgodia and Nisbett (1977) discuss that channel mediums may matter and create different outcomes in persuasion. They note how face-to-face discussions about a teacher's effectiveness were much more persuasive (especially with anecdotal evidence), than paper explanations of their effectiveness. Thus, the 100 percent narrative message and narrative heavy blends may have performed better in a richer medium, such as face-to-face communications.

While it is possible this affected the results, it is more probable that the results indicate that both narrative and statistics are effective but for different reasons. Both the Elaboration Likelihood Model (ELM) explains this interpretation. ELM distinguishes between two routes of persuasion – the central route and the peripheral route. (Petty & Cacioppo, 1986). Central route processers require a great deal of thought and scrutinize messages. On the other hand, peripheral route processers tend to not cognitively break down messages and instead rely on peripheral cues, which are stimuli that can affect attitudes without processing the message. Examples of peripheral cues include perceived source attractiveness and credibility, number of arguments and message length.

One interpretation may be that the messages constructed in this study did not lead people to cognitively process or break down the messages. Not all persuasion is necessarily based on rigorous reasoning. People may have been just looking at whether there was evidence included in the message (and not necessary the quality of the evidence) to become persuaded. Thus, the results of the study could be explained by saying people peripherally processed the messages and were persuaded simply by the fact that evidence was present. However, it seems unlikely that all of the subjects peripheral processed the messages. First, the subjects were all meat eaters and the messages were about the way meat is produced in the America. This would give people motivation to break down the messages as they relate to the food they put in their bodies. Additionally, some people have an innate need for cognitive processing.

While a variety of situational factors affect route selection, such as personal relevance of the message, there also is a chronic individual difference in route selection in a person's innate need for cognition (Petty & Cacioppo, 1986). Simply put, some people have a higher need for high-level thinking and scrutinizing evidence than others. "*Low need for cognition individuals are not characterized as unable to differentiate cogent from specious arguments, but rather they typically prefer to avoid the effortful, cognitive work required to derive their attitudes based on the merits of arguments presented*" (Drolet, 2009, italics mine).

Statistics withstand being broken down cognitively better than narratives as they by definition account for a larger sample size (Hoeken, 2001a). Thus, people with a high need for cognition would likely be more influenced by statistics. On the other hand, people with a low need for cognition are more likely rely on peripheral cues and fail to break down statistics. (Kahneman & Tversky, 1972,1973). This indicates that people with a low need for cognition would be less likely to be persuaded by statistics and would respond better to a narrative with strong peripheral cues. This is an important explanation with significant implications for practice.

Simply put, it is not so much a difference in evidence types but a difference in people and how they respond to evidence types that determines whether or not messages are persuasive. People are diabolically different and while some gravitate toward persuasion by statistics, others are more moved by personal narratives.

Practical Implications

34

While it is certainly interesting to learn that certain people prefer narratives while others prefer statistics and that there is no optimum blend of narratives and statistics for persuasion, this presents challenges from a practical standpoint. Until communicators have reliable information they are dealing with a sub population that consists of a common preference for either narratives or statistics, they will need to develop strategies that appeal to both groups.

Generally, communicators do not have the luxury of knowing if their audience tends to prefer narratives or statistics. Usually communicators are trying to reach a broad audience. For example, in this context beef producers are attempting to reach a broad band of consumers with their message. No doubt, a group as wide-ranging as meat consumers will include both people who would prefer centrally processing and thus would be more susceptible to persuasion by statistics and others who would be more moved by peripherally processing a narrative. This study took an extra step to attempt to account for particular individual differences - information that could help in creating a tactical approach. However, breaking down groups by geography, gender and age still did not provide a homogeneous preference towards an evidence type. This indicates that absent of communicating with a highly specialized group (e.g., scientists), it is unlikely a target audience will share a common preference for either statistics or narratives. So how do you reach a broad group with a variety of processing needs?

One approach is mass communication messages to the masses. These messages will need to provide both narrative and statistical evidence to support the same claim in order to appeal to both preferences. If a communication message does not contain some degree of both narrative and statistical messages it is likely that communicators may only be successful at persuading (or reaching) half of the public.

Additionally, further analysis of the results and recent research indicates communicators should consider their argument topic and communication channel when determining the amount of narrative and statistical evidence they chose to use. While both evidence types should be utilized regardless – it may be strategic to provide more of one evidence type in certain situations. When determining communication channels, rich channels should be utilized when possible. And when rich channels are used, heavier anecdotal evidence will likely be more effective at connecting ideas with targets.

One area for potential future research would be look for an interaction between channel type and the optimum blend for narratives and statistics for persuasion. Additionally, more

research into need for cognition and factors determinative of a group's need for cognition could help when looking to select evidence types. Finally, a follow up study look at relationship between central processing and different evidence types would be beneficial.

Tactical Recommendations for the Beef Industry

The good news for the agriculture industry is that in general, the perceptions of credibility of the communicator—a livestock producer in this case—were quite high. Because source credibility did not differ amongst the blends, this suggests that participants perceive livestock producers to be considerably component and trustworthy. This finding supports the trend we have already seen with people ranking farmers and ranchers as a good, credible source of information. (Delta Farm Press, 2004).

So how can a producer take the findings of this study to deliver an effective persuasive message?

The motivation for this study came from a reoccurring discussion at agriculture meetings. While many in the industry insisted communication to the public had to be fact laden and science based, others felt consumers really wanted to connect personally with producers and sharing personal stories (narratives) is the way to accomplish this. It is very likely that people within the agriculture industry are split in terms of what they personally find persuasive (narratives or statistics) just like the population at large and were advocating for the evidence type they personally prefer.

This study shows that both groups are right. Some members of the public require science and facts in order to be persuaded. On the other hand, other people are more likely to accept positions supported by personal narratives. Thus, the agriculture industry must provide both narratives and statistics in order to effectively reach, and ultimately persuade, both subsets of the population.

Beef advocates must be sufficiently familiar with the relevant statistics that support their claims. On top of this, beef advocates should undergo media training to become comfortable sharing these statistics as well as their personal stories. Livestock producers tend to be rugged individualists as well as humble by nature. This combination does not naturally lend itself towards self-promotion. In order to bridge this gap producers need to first become comfortable

promoting themselves and their industry and second learn how to reach out and connect with an urban consumer.

Programs like National Cattlemen's Beef Association's (NCBA) Master's of Beef Advocacy (MBA) program and the National Pork Producer Council's (NPPC) Operation Main Street serve as great training tools to learn the relevant facts as well as tips for telling personal narratives. Agriculture advocates must take this training and implement its ideas – sharing both statistics and narratives that back up their messages.

Additionally, advocates should utilize a variety of communication mediums – from printed letters to the editor and news media to the online environment and face-to-face communication – to disseminate their message. Multi-channel messaging combining traditional and new media is the most effective way to reach the greatest number of people (Kessler, 2006). Barack Obama's 2008 presidential campaign is recognized for its successful mobilization of new media and optimizing old, new, and different mediums to reach traditional and new audiences.

The medium for the message in this study was a traditional letter to the editor. While this remains a viable output for advocacy, technology is changing the way the world communicates and other communication channels should also be utlized. Newspaper circulation has been on the decline since 1987 (Ahrens, 2009). Only 13 percent of Americans, or about 39 million people, now buy a daily newspaper, down from 31 percent in 1940. This decline can be attributed to a combination of less people reading the news daily and more people getting their news online (Pew, 2009). The Pew Research Center's 2008 media consumption survey revealed a drop in the percentage of respondents reporting that they read the newspaper, either print or online, from 34 percent to 25 percent. At the same time, people reporting they read an online newspaper yesterday grew from 9 percent to 14 percent.

Figure 5.1 Newspaper Readership

Newspaper Readership:
Print and Online

43

2006	2008
5	9
4	9
34	5
	25

9

39

14

2006   2008
■ Print ▨ Both ■ Web
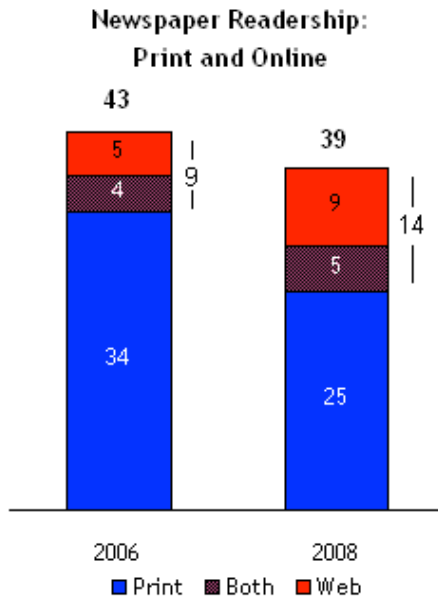
Additionally, 73 percent of all online users say they come across news online when they have been on the web for another purpose (Pew, 2008). A vast majority of online news users younger than 25 (64%) say they more often follow links to news stories, rather than go directly to the homepages of news organizations themselves. Examples of places these links are commonly found include blogs, emails and social media sites.

Use of social media sites like Facebook and Twitter is increasing quickly. According to The Nielsen Company, global consumers spent more than five and half hours on social networking sites like Facebook and Twitter in December 2009, an 82 percent increase from the same time last year when users were spending just over three hours on social networking sites (Nielson Wire, 2010).

Figure 5.2 Social Networking Site Traffic

Global Web Traffic to Social Networking Sites
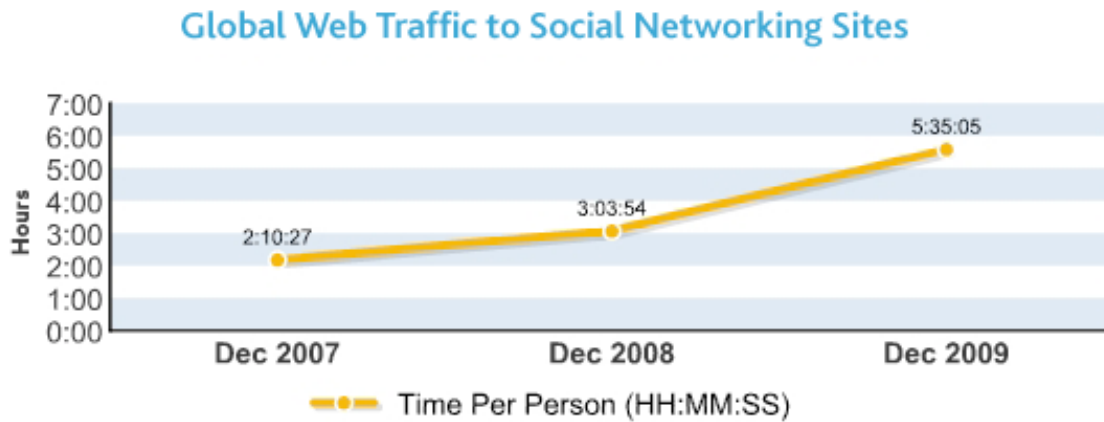
According to the Twitter Blog (2010), Twitter users were tweeting 5,000 times a day in 2007. By 2008, that number was 300,000, and by 2009 it had grown to 2.5 million per day. As of January 2010, the company is seeing 50 million tweets per day—that's an average of 600 tweets per second. And the counts do not include spam.

Figure 5.3 Twitter Use

Tweets per Day
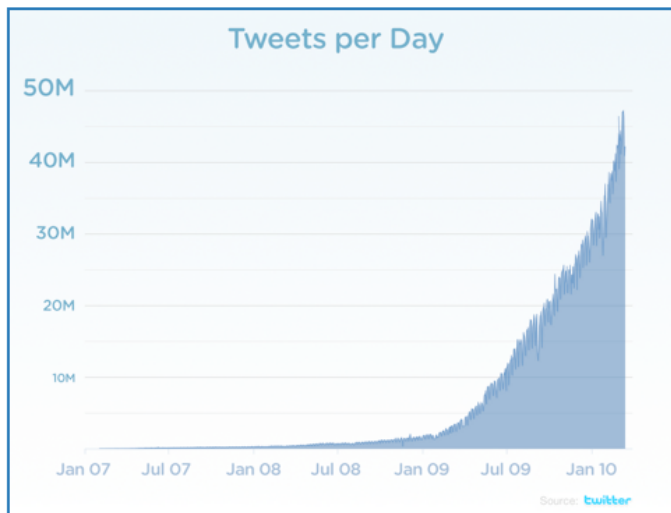
In my personal experience, social networking advocacy works. The Humane Society of the United States is an organization that – despite its misleading name – does not operate any animal shelters or spay and neuter clinics but does spend a considerable amount of its time and money lobbying against animal agriculture. From time to time, I utilize my personal Facebook

page to share this with others. Below is a screen shot of an interaction where my friend Craig's opinion of HSUS changed based on my Facebook advocacy. Craig is a law student specializing in administrative law with an interest in politics.

Figure 5.4 HSUS Uncovered on Facebook

Chelsea Good | join the fight to revoke HSUS's tax exempt status!

Join the fight to revoke The HSUS's tax −exempt status
ypcblog.beefusa.org
A new campaign is underway to petition the IRS to investigate alleged under−reported lobbying activities of the Humane Society of the United States (HSUS). Frank Losey of the Illinois Professional Pet ...

December 28, 2009 at 2:59pm · Comment · Like · Share

Josh Boehm and Craig Lowe like this.

Craig Paschang something makes me doubt that the Human Society could actually "put an end to animal agriculture" . . . and who's going to spay and neuter all of the stray animals if we put HSUS out of business?
December 28, 2009 at 3:03pm · Delete

Chelsea Good Your local Humane Societies are who do the work spay and neutering animals. HSUS is a national organization that lobbies against animal agriculture (among other things). The name confusion is probably intentional. Many people who donate to HSUS think they are contributing to local shelters.
http://www.localhumane.org/
http://www.activistcash.com/organization_overview.cfm/oid/136
December 28, 2009 at 3:07pm · Delete

Craig Paschang i feel so betrayed! that is insane
December 28, 2009 at 3:23pm · Delete

K.C. Kinder It still floors me how many people think HSUS does "good" work. I read something in the USA Today and it linked an article about shelters to HSUS. When I sent the writer information on them, she responded to me and was honestly upset. Score one for the good guys:) Now I want to go adopt a doggy!!!!
December 30, 2009 at 3:19pm · Delete

I had a similar interaction recently with my friend Tina, a Wichita nurse.

Figure 5.5 HSUS Uncovered on Facebook No. 2

Thus, social media should become an important channel for agriculture advocacy. Perhaps you found the statistics about social media persuasive in backing up this point. If not, then perhaps my personal experience was instrumental in garnering your support of the use of social media as a channel for agricultural advocacy. Or perhaps you are one of the unique dual processers who gained from both the statistics as well as my personal experience. The point is, most people tend to gravitate towards either statistics or narratives and had I included only one but not the other I would have missed out on the opportunity to meaningfully reach half of my audience.

Bottom line, in order to effectively reach a broad public both statistics and narratives messages need to be utilized. This study provides reason to suggest no magic blend of the two exists to reach optimum persuasion, but rather both need to be tapped into in order to access the people who tend to be persuaded by statistics as well as those who are more susceptible to narrative persuasion.

References

Ah Yun, J., & Massi, L. L. (2000). The differential impact of race on the effectiveness of narrative versus statistical appeals to persuade individuals to sign an organ donor card. Paper presented at the meeting of the Western States Communication Association, Sacramento, CA.

Ah Yun, J., & Massi, L. L. (2001). The relationship between narrative content variation, affective and cognitive reactions, and a person's willingness to sign and organ donor card. Paper presented at the meeting of the International Communication Association, Washington, D.C

Ahrens, S. (2009, October 27). The Accelerating Decline of Newspapers: Small Dailies are Rare Bright Spot in Latest Figures. *The Washington Post*. Retrieved from http://www.washingtonpost.com.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice Hall.

Allen, M., Bruflat, R., Fucilla, R., Kramer, M., McKellips, S., Ryan, D. & Spiegelhoff, M. (2000). Testing the persuasiveness of evidence: combining narrative and statistical forms. *Communication Research Reports, 17,* 331-336.

Allen, M. & Burrell, N. (1992). Evaluating the believability of sequential arguments. *Argumentation and Advocacy, 28,* 135-144.

Allen, M. & Preiss, R. (1997). Comparing the persuasiveness of narratives and statistical evidence using meta-analysis. *Communication Research Reports,14(2),* 125-131.

Andrews, C. J., Durvasala, S., & Akhter, S. H. (1990). A framework for conceptualizing and measuring the involvement construct in advertising research. *Journal of Advertising, 19*, 27-40.

Baesler, E. J. (1997). Persuasive effects of story and statistical evidence. *Argumentation and Advocacy, 33(4),* 170-175.

Baesler, J. & Burgoon, J. (1994). The temporal effects of story and statistical evidence on belief change. *Communication Research, 21(5),* 582-602.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychology Review, 84(2)*, 191-215.

Borgodia, E. & Nisbett, R.E. (1977). The differential impact of abstract vs. concrete information on decisions. *Journal of Applied Social Psychology, 7(3),* 258-271.

Braet, A. (1992). Ethos, pathos and logos in Aristotle's Rhetoric: A re-examination. *Argumentation*, 6(3), 307-320.

Brosius, H. (2000). Toward an exemplification theory of news effects. *Document Design, 2(1),* 18-27.

Bruner, J. (1986). *Actual minds, possible worlds.* Cambridge, MA: Harvard University Press.

Brusselle, R. & Bilandzic, H. (2008). Emotion and Cognition in Filmic Narrative Comprehension and Engagement. Paper presented at the annual meeting of the International Communication Association, Montreal, Canada.

Cathcart, R. S. (1955). An experimental study of the relative effectiveness of four methods of presenting evidence. *Speech Monographs, 22(3),* 227-233.

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39(5),* 752-766.

Chaiken, S. & Eagly, A. (1983). Communication modality as a determinant of persuasion: The role of communicator salience. *Journal of Personality and Social Psychology, 45(2),* 241-256.

Chaiken, S., Liberman, A., & Eagly, A. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212-252). New York: Guilford Press.

Chaiken, S., & Maheswaran, D. (1994). Heuristic processing can bias systematic processing: Effects of source credibility, argument ambiguity, and task importance on attitude judgment. *Journal of Personality and Social Psychology, 66,* 460-473.

Clore, G. L. & Schanll, S. (2005). The Influence of Affect on Attitude. In: Albarracin, D., Johnson, B. & Zanna, M. *The Handbook of Attitudes*, Mahwah, NJ: Lawrence Erlbaum Associates.

Cox, D. & Cox, A. D. (2001). Communicating the consequences of early detection: the role of evidence and framing. *Journal of Marketing, 65(3),* 91-103.

Daft, R.L. & Lengel, R.H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, 32(5), 554-571.

Delta Farm Press. (2004, April 7). Trust in Agriculture and Food Choice Freedom High. Retrieved from http://deltafarmpress.com/news/food-choice/.

Dickson, P. R. (1982). The impact of enriching case and statistical information on consumer judgments. *Journal of Consumer Research, 8(4),* 398-406.

Dillard, J. & Pfau, M. (2002). *The Persuasion Handbook.* Thousand Oaks, CA: Sage.

Drolet, A., Luce, M. F., & Simonson, I. (2009). When does choice reveal preference? Moderators of heuristic versus goal-based choice. *Journal of Consumer Research, 36(1),* 137-148.

Green, M. C. & Brock, T. C. (2002). In the mind's eye: Transportation-imagery model of narrative persuasion. In M.C. Green, J.J. Strange, & T.C. Brock (Eds.), *Narrative impact: Social and cognitive foundations* (pp. 315-341). Mahwah, NJ: Lawrence Erlbarum.

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79(5),* 701-721.

Greene, K. & Brinn, L .S. (2003). Messages Influencing College Women's Tanning Bed Use: Statistics versus Narrative Evidence Forman and a Self-Assessment to Increase Perceived Susceptibility. *Journal of Health Communication, 8(5),* 443-461.

Haugtvedt, C. P., Petty, R. E., & Cacioppo, J. T. (in press). Need for cognition and advertising: Understanding the role of personality variables in consumer behavior. *Journal of Consumer Psychology.*

Hoken, H. (2001a). Anecdotal, statistical, and causal evidence: Their perceived and actual persuasiveness. *Argumentation, 15*, 425-437.

Hoeken, H. (2001b). Convincing citizens: the role of argument quality. In: Janssen, D. & Neutelings, R. (Eds.). *Reading and writing public documents*, Amsterdam: Benjamins.

Hoeken, J. & Hustinx, L. (2009). When is Statistical Evidence Superior to Anecdotal evidence in Supporting Probability Claims? The Role of Argument Type. *Human Communication Research, 35(4),* 491-510.

Hoeken, H. & Hustinx, L. (2006). Argument Quality and Evidence Types: When Is Statistical Evidence Superior to Anecdotal Evidence?" Paper presented at the annual meeting of the International Communication Association, Dresden International Congress Centre, Dresden, Germany.

Hornikx, J. (2005). A review of experimental research on the relative persuasiveness of anecdotal, statistical, causal, and expert evidence. *Studies in Communication Sciences, 5(1),* 205-216.

Hornikx, J. (2007). Is anecdotal evidence more persuasive than statistical evidence? A comment on classic cognitive psychological studies. *Studies in Communication Sciences, 7(2),* 151-164. Retrieved from Communication & Mass Media Complete database.

Hornikx, J. (2008). Comparing the actual and expected persuasiveness of evidence types: How good are lay people at selecting persuasive evidence? *Argumentation, 22(4),* 555-569.

Hornikx, J. & Houët, T. (2009, January). The persuasiveness of normatively strong and normatively weak anecdotal evidence in combination with statistical evidence. Paper contributed to the Rhetoric In Society conference (2nd). Leiden, The Netherlands. Retrieved from: http://www.rhetoricandsociety.nl/rhetoricinsociety/abstract/index.php.

Hovland, C. I. & Weiss, W. (1951). The influence of source credibility on communication effectiveness. *Public Opinion Quarterly, 15*, 635-650.

Iyengar, S. & Kinder, D. R. (1987). *News that matters.* Chicago: University of Chicago Press.

Johnson, B. T. & Eagly, A. H. (1989). Effects of involvement on persuasion: A meta-analysis. *Psychological Bulletin, 106,* 290-314.

Kahneman, D. & Tversky, A. (1972). Subjective probability: a judgment of representativeness. *Cognitive Psychology, 3,* 430-454.

Kahneman, D. & Tversky, A. (1973). On the psychology of prediction. *Psychological Review, 80(4),* 237-251.

Kaplan, M. F. (1981). State dispositions in social judgment. *Bulletin of the Psychonomic Society. 18,* 27-29.

Kaplan, M. F. (1991). The joint effects of cognition and affect on social judgment. In J. P. Forgas, (Ed.), *Emotion and social judgments* (pp. 73-82). New York: Pergamon Press.

Kaplan, M. F., and Anderson, N. H. (1973). Information integration theory and reinforcement theory as approaches to interpersonal attraction. *Journal of Personality and Social Psychology, 28,* 1443-1455.

Kazoleas, D. C. (1993). A comparison of the persuasive effectiveness of qualitative versus quantitative evidence: a test of explanatory hypotheses. *Communication Quarterly, 41(1),* 40-50.

Kellermann, K. (1980). The concept of evidence: a critical review. *Journal of the American Forensic Association, 16(3),* 159-172.

Kelman, H., & Hovland, C. I. (1953). Reinstatement of the communication in delayed measurement of attitude change. *Journal of Abnormal Social Psychology, 48*, 327-335.

Kessler, S. (2006, November 8). Old Media and New Media: Friends, Not Foes. Business Week. Retrieved from http://www.businessweek.com/investor/content/nov2006/pi20061108_232958.htm.

Koballa, T. R. (1986). Persuading teachers to reexamine the innovative elementary science programs of yesterday: the effect of anecdotal versus data-summary communications. *Journal of Research in Science Teaching, 23(5),* 437-449.

Kopfman, J., Smith, S., Ah Yun, K. & Hodges, A. (1998). Affective and cognitive reactions to narrative versus statistical evidence organ donation messages. *Journal of Applied Communication Research, 26(3),* 279-300.

Kreuter, M. (2007). Using Narrative Communication as a Tool for Health Behavior Change: A Conceptual, Theoretical, and Empirical Overview. *Health Education & Behavior, 34(5)*, 777-792.

Kruglanski, A. W. & Stroebe, W. (2005). The Influence of Beliefs and Goals on Attitudes: Issues of Structure, Function, and Dynamics. In: Albarracin, D., Johnson, B. & Zanna, M. *The Handbook of Attitudes*, Mahwah, NJ: Lawrence Erlbaum Associates.

Massi, L. & Ah Yun, J. (2003). Examining the Persuasive Effect of Statistical Messages: A Test of Mediating Relationships. *Communication Studies, 54(3),* 306-322.

McCroskey, J. C. (1969). A summary of experimental research on the effects evidence in persuasive communication. *Quarterly Journal of Speech, 55(2),* 169-176.

Morgan, S. E., Cole, H. P., Shuttmann, T., & Piercy, L. (2002). Stories of Statistics? Farmes' Attitudes Towards Messages in an Agricultural Safety Campaign. *Journal of Agricultural Safety and Health, 8(22),* 225-239.

Nadler, M. A. K. (1983). Evidence usage in persuasion. *Dissertation Abstracts International, 44,* 910A.

Nan, X. (2007). The Effect of Perceived Source Credibility on Persuasion: Moderators and Mechanism. Paper contributed to the International Communication Association Conference (59th). San Francisco, California.

Nielsen Wire. (2010, January 22). Led by Facebook, Twitter, Global Time Spent on Social Media Sites up 82% Year over Year. Message posted to http://blog.nielsen.com/nielsenwire/global/led-by-facebook-twitter-global-time-spent-on-social-media-sites-up-82-year-over-year/.

Nisbett,, R. & Borgida, E. (1975). Attribution and the psychology of prediction. *Journal of Personality and Social Psychology, 32(5),* 932-943.

Nisbett, R., Borgida, E., Crandall, R., & Reed, H. (1976). Popular induction: Information is not necessarily informative. In J.S. Carrol and J.W. Payned (Eds.), *Cognition and social behavior* (pp. 113-133). Hillsdale, NJ: Lawrence Erlbaum.

Nisbett, R. & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment.* Englewood Cliffs, NJ: Prentice-Hall.

Norwood, B., Lusk, J., & R. Prickett (2007, October 8). Consumers share Views on Animal Welfare. *Feedstuffs*, 14-15.

Ornstein, R. E. (1997). The Right Mind: Making Sense of the Hemispheres. United States of America: Harcourt Brace & Company.

Petty, R. E., & Cacioppo, J. T. (1986). *Communication and Persuasion: Central and Peripheral Routes to Attitude Change.* New York: Springer-Verlag.

Pew Research Center for the People & the Press. (2008, August 17). Key News Audiences Now Blend Online and Traditional Sources. Retrieved from: http://people-press.org/report/?pageid=1354.

Pew Research Center for the People & the Press. (2009, February 26). Newspapers Face a Challenging Calculus: Online Growth, but Print Losses are Big. Retrieved from: http://pewresearch.org/pubs/1133/decline-print-newspapers-increased-online-news.

Reinard. J. (1988). The empirical study of the persuasive effects of evidence; the status after fifty years of research. *Human Communication Research,* 15(1), 3-59.

Reynolds, R. A. & Reynolds, J. L. (2002). Evidence. In: Dillard, J.P. & Pfau, M. (eds.). *The persuasion handbook: developments in theory and practice*, Thousand Oaks, CA: Sage.

Rieke, R. & Sillars, M. O. (1984). *Argumentation and the decision making process*, New York: Harper Collins.

Schank, R. C., & Berman, T. R. (2002). The pervasive role of stories in knowledge and action. In M. C. Green, J. J. Strange, & T. C. Brock (Eds.), *Narrative impact: Social and cognitive foundations* (pp. 287-313). Mahwah, NJ: Lawrence Erlbaum.

Sheirf, M. & Hovland, C. I. (1961). *Social judgment: Assimilation and contrast effects in communication and attitude change.* New Haven, CT: Yale University Press.

Sherer, M. & Rogers, R.W. (1984). The role of vivid information in fear appeals and attitude change. *Journal of Research in Personality,* 18(3) 321-334.

Slater M. D. (2002). Involvement as goal-directed strategic processing: Extending the elaboration likelihood model. In J. Dillard & M. Pfau (Eds.), *The Persuasion Handbook: Developments in theory and practice* (pp. 175-194). Thousand Oaks, CA: Sage.

Slater, M. D. & Rouner, D. (1996). Value-affirmative and value-protective processing of alcohol education messages that include statistical evidence or anecdotes. *Communication Research, 23(2),* 210-235.

Slater, M. D. & Rouner, D. (2002). Entertainment—Education and Elaboration Likelihood: Understanding the Processing of Narrative Persuasion. *Communication Theory, 12(2),* 173-191.

Smith, E. R. & Mackie, D. M. (2000). *Social Psychology*. New York: Psychology Press.

Staher, C. (2006). How many adults are vegetarian? The Vegetarian Resource Group asked in a 2006 national poll. Vegetarian Journal. Retrieved May 2 from http://findarticles.com/p/articles/mi_m0FDE/is_4_25/ai_n16834301/

Stephenson, M. T. (1999). *Message sensation value and sensation seeking as determinants of message processing.* Unpublished dissertation, University of Kentucky.

Stephenson, M. T. (in press). Sensation seeking as a moderator of the processing of anti-heroin PSAs. *Communication Studies, 53(3).*

Stitt, C. R. & Nabi, R. L. (2005). The Persuasive Impact of Narratives: A Comparison Across Message Types and Modalities. Paper contributed to the International Communication Association Conference (55th). New York, New York.

Taylor, S. E. & Thompson, S. C. (1982). Stalking the elusive "vividness" effect. *Psychological Review, 89(2),* 155-181.

Twitter Blog. (2010, February 22). Measuring Tweets. Message posted to http://blog.twitter.com/2010/02/measuring-tweets.html.

United States Department of Agriculture: Introduction. (2009). Retrieved May 21, 2009, from United States Department of Agriculture: Cooperative State Research, Education, and Extension Service Web site: http://www.csrees.usda.gov/qlinks/extension.html

Warren, I. D. (1969). The effects of credibility in sources of testimony on audience attitudes toward speaker and message. *Speech Monographs, 36,* 456-458.

Weinstein, N. (1988). The precaution adoption process. *Health Psychology,* 7(4), 355-386.

Wells, G. L. & Harvey, J. H. (1977). Do people use consensus information in making causal attributions? *Journal of Personality and Social Psychology, 35(5),* 279-293.

Winterbottom, A., Bekker, H., Conner, M., & Mooney, A. (2008). Does narrative information bias individual's decision making? A systematic review. *Social Sciences& Medicine, 67(12),* 2079-2088.

Appendix A - Pre Test (Demographic Questions)

Gender: M _____   F _____

Age: 18-24 ____   24-35 ____   36-45 ____   46-55 ____   56-65 ___   66-75 ___   76+ ___

Which best describes where you grew up: Rural ____   Suburban ____   Urban ____

Which best describes where you grew up: Rural ____   Suburban ____   Urban ____

Race:

___ American Indian and Alaska Native

___ Asian

___ Black or African American

___ Native Hawaiian and Other Pacific Islander

___ White

___ American Indian and Alaska Native and White

___ Asian and White

___ Black or African American and White

___ American Indian and Alaska Native and Black or African American

___ Other/ Wish Not to Respond

How familiar/connected are you with animal agriculture?

Not   Very

Familiar   Familiar

1   2   3   4   5   6   7   8   9   10

Which best describes your eating habits?

Vegan ___   Vegetarian ____   Meat Eater ___

Appendix B - Credibility Scale

Rank your level of agreement with the following statements:

1. The message is written by someone who knows the topic.

    Disagree   Agree
    1   2   3   4   5

2. The message is sincere.

    Disagree   Agree
    1   2   3   4   5

3. The message is believable.

    Disagree   Agree
    1   2   3   4   5

4. The message is dishonest.

    Disagree   Agree
    1   2   3   4   5

5. The message is trustworthy.

    Disagree   Agree
    1   2   3   4   5

6. The message is dynamic.

    Disagree   Agree
    1   2   3   4   5

Appendix C - Narrative Involvement Scale

Rank your level of agreement with the following statements:

1. I was mentally involved in the message while reading it.

   Disagree   Agree

   1   2   3   4   5

2. I was never really pulled into the message.

   Disagree   Agree

   1   2   3   4   5

3. While reading I was completely immersed in the message.

   Disagree   Agree

   1   2   3   4   5

4. Overall, the reading experience was intense for me.

   Disagree   Agree

   1   2   3   4   5

5. I wanted to learn how the message ended.

   Disagree   Agree

   1   2   3   4   5

6. While reading I wanted to know how the events would unfold.

   Disagree   Agree

   1   2   3   4   5

Appendix D - Persuasion Scale

Rank your level of agreement with the following statements:

    1. I accept the conclusion of this message.

        Disagree   Agree

        1   2   3   4   5

    2. I agree with the writer's conclusion.

        Disagree   Agree

        1   2   3   4   5

    3. I think the writer is wrong.

        Disagree   Agree

        1   2   3   4   5

    4. My opinion is consistent with the writer's message.

        Disagree   Agree

        1   2   3   4   5

    5. I believe the message conclusion.

        Disagree   Agree

        1   2   3   4   5

Appendix E - Narrative Evidence List

A(N). After seeing a video of cattle being abused by sale barn employees, I was extremely angry with those workers. The way they treated the animals in the video was not appropriate and doesn't reflect how I treat my animals at all. In response, I visited my local sale barn to talk with the employees and give them cattle care and handling training videos. After working with the sale barn workers I am certain they treat animals with care and respect just like I do.

B(N). I have yearly meetings with my veterinarian, Steve, where I walk him through my barn and pastures and talk to him about my farm's practices. Then, we sit down and amend the specific written protocols we've developed for my farm. For example, last year he noticed one of my heifer groups were a bit thinner than some of the others so we adjusted that group's diet. These annual meetings ensure that I'm doing everything I can to best care for the well being of my animals.

C(N). One of my favorite memories of growing up is riding with my dad and grandpa in my dad's single cab, brown Ford pickup truck to go check cows in the field. Now, my two sons, Nathan and Riley, ride with me to check cows in those same pastures and that same truck. Riley told me the other day that when he's a dad he wants to do the same thing with his son. Because I want my sons to have the opportunity to make a living on our family's ranch, I treat my land and animals with only the greatest care and respect every day.

D(N). I was talking to a mom in front of the meat case at the grocery store the other day. She mentioned to me that she was worried about the safety of feeding her family beef. I told her that as a father, I worry about the health and safety of my children too, but I don't worry about the safety of the beef I feed them. I know the beef I produce is safe and wholesome. In fact, I'm so confident about the safety of the product, the beef we send to the grocery store is the same I feed my family. The mom I spoke with ended up buying flat iron steaks to feed her family that night.

 E(N). I care about my animals not only because it's how I make a living, but also because it's the right thing to do. Last winter one of the cows calved in the middle of the night during a fierce snowstorm. My family brought the calf into the kitchen of our home and warmed it up by rubbing it with towels. We wanted to make sure that calf had a safe, warm start to its life.

Appendix F - Statistical Evidence List

A(S). Undercover videos of animal abuse in sale barns are not the industry norm. To date, the industry has distributed more than 2,000 cattle care and handling training videos to the nation's 1,250 livestock markets and other cattle sales locations.

B(S). More than 90 percent of cattle in the U.S. are handled by practices influenced by the voluntary, industry-driven Beef Quality Assurance (BQA) program. This program works to prevent disease, establish written protocols and establish valid veterinarian client-patient relationships.

C(S). Beef producers love their animals and lifestyle. In a survey conducted by the Iowa Beef Center, 60 percent of producers indicated they intended to pass their operation on to their children.

D(S). Beef producers have invested 27 million dollars in beef safety research through the beef checkoff since 1993 and, collectively, the industry continues to invest $350 million each year in safety research, technology and practices.

E(S). Beef produced in the U.S. is safe and wholesome. The incidence of E. coli O157:H7 in ground beef declined more than 80 percent between 2000 and 2006, according to USDA's Food Safety and Inspection Service (FSIS).

Appendix G - Letter to the Editor Template

Dear Editor,

I'm writing in response to a recent story published in your paper talking about the need for additional regulation on animal agriculture. I'm a third generation beef producer and took offense to the article. My fellow cattle growers and myself care greatly about the welfare of our animals and produce a safe, wholesome product.

Insert evidence 1. Additionally, insert evidence 2.

On top of this, insert evidence 3. Finally, insert evidence 4.

Thank you for your time and attention to this letter. It's important that people realize how much beef producers really do care about their cattle and producing a safe product for Americans and consumers around the world.

Sincerely,

James Rolland

Appendix H - Sample Letter to the Editors

a. Sample Letter to the Editor - 100 % Narrative

Dear Editor,

    I'm writing in response to a recent story published in your paper talking about the need for additional regulation on animal agriculture. I'm a third generation beef producer and took offense to the article. My fellow cattle growers and myself care greatly about the welfare of our animals and produce a safe, wholesome product.

    I love my animals and the rural lifestyle I live. It's s legacy I hope to be able to pass on to my own sons, Nathan and Riley, when they are old enough to take over our family's ranch. Additionally, I've worked hand in hand with my local sale barn, providing them cattle care and handling training videos. Undercover videos of animal abuse in sale barns are not the industry norm. I know the employees at my sale barn well and see that they treat animals with care and respect.

    On top of this, every time one of my fellow producers or I sell a head of cattle, we contribute $1 to the beef checkoff, which invests in beef safety research. For example, checkoff research led to new protocols in packing plants that help reduce pathogens.. Finally, the beef I produce is safe and wholesome. I have never had a problem with E. coli in my livestock and neither has any producer I know. In fact, I'm so sure of my product's safety, the beef we send to the grocery store is the same meat I feed my family.

    Thank you for your time and attention to this letter. It's important that people realize how much beef producers really do care about their cattle and producing a safe product for Americans and consumers around the world.

Sincerely,

James Rolland

b. Sample Letter to the Editor 75% Narrative 25% Statistics

Dear Editor,

I'm writing in response to a recent story published in your paper talking about the need for additional regulation on animal agriculture. I'm a third generation beef producer and took offense to the article. My fellow cattle growers and myself care greatly about the welfare of our animals and produce a safe, wholesome product.

I care about my animals not only because it's how I make a living, but also because it's the right thing to do. Last winter one of the cows calved in the middle of the night during a fierce snowstorm. My family brought the calf into the kitchen of our home and warmed it up by rubbing it with towels. We wanted to make sure that calf had a safe, warm start to its life. Additionally, after seeing a video of cattle being abused by sale barn employees, I was extremely angry with those workers. The way they treated the animals in the video was not appropriate and doesn't reflect how I treat my animals at all. In response, I visited my local sale barn to talk with the employees and give them cattle care and handling training videos. After working with the sale barn workers I am certain they treat animals with care and respect just like I do.

On top of this, I was talking to a mom in front of the meat case at the grocery store the other day. She mentioned to me that she was worried about the safety of feeding her family beef. I told her that as a father, I worry about the health and safety of my children too, but I don't worry about the safety of the beef I feed them. I know the beef I produce is safe and wholesome. In fact, I'm so confident about the safety of the product, the beef we send to the grocery store is the same I feed my family. The mom I spoke with ended up buying flat iron steaks to feed her family that night. Finally, more than 90 percent of cattle in the U.S. are handled by practices influenced by the voluntary, industry-driven Beef Quality Assurance (BQA) program. This program works to prevent disease, establish written protocols and establish valid veterinarian client-patient relationships.

Thank you for your time and attention to this letter. It's important that people realize how much beef producers really do care about their cattle and producing a safe product for Americans and consumers around the world.

Sincerely,

James Rolland

c. Sample Letter to the Editor 50% Narrative 50% Statistics

Dear Editor,

    I'm writing in response to a recent story published in your paper talking about the need for additional regulation on animal agriculture. I'm a third generation beef producer and took offense to the article. My fellow cattle growers and myself care greatly about the welfare of our animals and produce a safe, wholesome product.

    I love my animals and the rural lifestyle I live. It's a legacy I hope to be able to pass on to my own sons, Nathan and Riley, when they are old enough to take over our family's ranch. Additionally, the U.S. Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS) implements a series of safeguards to protect against foodborne disease and illness. Veterinary inspectors check all livestock visually before slaughter, examining more than 100 million food animals each year.

    On top of this, more than 90 percent of cattle in the U.S. are handled by practices influenced by the voluntary, industry-driven Beef Quality Assurance (BQA) program. This program works to prevent disease, establish written protocols and establish valid veterinarian client-patent relationships. Finally, when I sell cattle for beef, each and every one of them is inspected by a veterinarian before slaughter as a safeguard against harvesting cattle that could present disease or illness issues.

    Thank you for your time and attention to this letter. It's important that people realize how much beef producers really do care about their cattle and producing a safe product for Americans and consumers around the world.

Sincerely,

James Rolland

d. Sample Letter to the Editor 25% Narrative 75% Statistics

Dear Editor,

I'm writing in response to a recent story published in your paper talking about the need for additional regulation on animal agriculture. I'm a third generation beef producer and took offense to the article. My fellow cattle growers and myself care greatly about the welfare of our animals and produce a safe, wholesome product.

More than 90 percent of cattle in the U.S. are handled by practices influenced by the voluntary, industry-driven Beef Quality Assurance (BQA) program. This program works to prevent disease, establish written protocols and establish valid veterinarian client-patient relationships. Additionally, one of my favorite memories of growing up is riding with my dad and grandpa in my dad's single cab, brown Ford pickup truck to go check cows in the field. Now, my two sons, Nathan and Riley, ride with me to check cows in those same pastures and that same truck. Riley told me the other day that when he's a dad he wants to do the same thing with his son. Because I want my sons to have the opportunity to make a living on our family's ranch, I treat my land and animals with only the greatest care and respect every day.

On top of this, beef produced in the U.S. is safe and wholesome. The incidence of E. coli O157:H7 in ground beef declined more than 80 percent between 2000 and 2006, according to USDA's Food Safety and Inspection Service (FSIS). Finally, beef producers have invested 27 million dollars in beef safety research through the beef checkoff since 1993 and, collectively, the industry continues to invest $350 million each year in safety research, technology and practices.

Thank you for your time and attention to this letter. It's important that people realize how much beef producers really do care about their cattle and producing a safe product for Americans and consumers around the world.

Sincerely,

James Rolland

e. Sample Letter to the Editor 100% Statistics

Dear Editor,

I'm writing in response to a recent story published in your paper talking about the need for additional regulation on animal agriculture. I'm a third generation beef producer and took offense to the article. My fellow cattle growers and myself care greatly about the welfare of our animals and produce a safe, wholesome product.

More than 90 percent of cattle in the U.S. are handled by practices influenced by the voluntary, industry-driven Beef Quality Assurance (BQA) program. This program works to prevent disease, establish written protocols and establish valid veterinarian client-patent relationships. Additionally, undercover videos of animal abuse in sale barns are not the industry norm. To date, the industry has distributed more than 2,000 cattle care and handling training videos to the nation's 1,250 livestock markets and other cattle sales locations.

On top of this, the U.S. Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS) implements a series of safeguards to protect against foodborne disease and illness. Veterinary inspectors check all livestock visually before slaughter, examining more than 100 million food animals each year. Finally, beef produced in the U.S. is safe and wholesome. The incidence of *E. coli* O157:H7 in ground beef declined more than 80 percent between 2000 and 2006, according to USDA's Food Safety and Inspection Service (FSIS).

Thank you for your time and attention to this letter. It's important that people realize how much beef producers really do care about their cattle and producing a safe product for Americans and consumers around the world.

Sincerely,

James Rolland

Appendix I - Manipulation Check Scale

Please rank the evidence you just read on the following scales.

The message is very scientific   _ _ _ _ _ _ _   The message is not very scientific

I can see this clearly in my mind   _ _ _ _ _ _ _   I cannot see this clearly in my mind

The message is based on   _ _ _ _ _ _ _   This message is not based on
    numeric data   numeric data.

I can hear this clearly in my mind   _ _ _ _ _ _ _   I cannot hear this clearly in my mind

The setting is clear in my mind   _ _ _ _ _ _ _   The setting is not clear in my mind