



# Testing Language: Media Language Influence on Public Attitudes About River Management

By: Kristan Cockerill

## Abstract

Everyday we make decisions on diverse topics using information from a wide variety of sources. This project builds on existing research about how people internalize information they skim from newspapers and the influence this has on their attitudes about policy concerns. Specifically, this research asked how readers assimilate information about issues with which they are unfamiliar, such as those with strong scientific components, like natural resource management. This experiment tested how manipulating a local news article about the ecological impacts of flooding influenced reader responses concerning river management decisions. The findings show that variations in tone and language significantly impact public attitudes about relevant policy actions. Additionally, article language and tone affect reader opinion regarding how much scientists and experts “know” about flooding impacts.

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## **Testing Language: Media Language Influence on Public Attitudes About River Management**

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### **ABSTRACT**

Everyday we make decisions on diverse topics using information from a wide variety of sources. This project builds on existing research about how people internalize information they skim from newspapers and the influence this has on their attitudes about policy concerns. Specifically, this research asked how readers assimilate information about issues with which they are unfamiliar, such as those with strong scientific components, like natural resource management. This experiment tested how manipulating a local news article about the ecological impacts of flooding influenced reader responses concerning river management decisions. The findings show that variations in tone and language significantly impact public attitudes about relevant policy actions. Additionally, article language and tone affect reader opinion regarding how much scientists and experts “know” about flooding impacts.

## **BACKGROUND**

The news inundates us daily with headlines, photographs and columns of words splashed across our dining room tables and our office desks. The words and phrases we skim from the pages enter our thought processes and influence our decisions about everything from the trivial to the crucial. The movies we see, the causes we fund, the candidates we vote for and the policies we support have likely been guided to some extent by our relationships with local news sources. This raises fundamental questions about the nature of these influences and the role they play in our public lives. What are the ramifications for public policy when public and policy-maker decisions flow in part from media choices?

This project began by questioning the influence that print media might have on public policy issues related to science-heavy topics like natural resource management. More specifically, this experiment tested how manipulating language and tone in a news article about flooding impacts influenced reader opinion about potential river management options. Public relations and advertising specialists have long employed the power in language by selecting particular words to evince emotion or to evoke a desired response. Words create images, which influence conscious and unconscious responses among readers. Likewise, how reporters and their editors choose to frame a story, as well as the specific words they choose, affect how readers react and hence influence those readers' attitudes about various policy alternatives.

This work builds on the theory that we wade through the information stream by employing schema, which Roger Fowler (1991, p. 43) defined as "a chunk of unconscious knowledge, shared within a group of people and drawn upon in making sense of the world." Additionally, "Schema theory suggests that contact with information prompts people to activate units of organized knowledge that help place the new information in a useful context" (Wicks & Drew, 1991, p. 155). Schema-based research has analyzed how people remember and comprehend what they read and how they integrate new information about various subjects into their thought processes (Graber, 1988; Wicks & Drew, 1991; Wicks, 1995). A fundamental

premise within schema theory as it pertains to reading the news is that readers “know” the significance of journalistic codes through exposure and this knowledge generates a common understanding between the text and the reader. As Fowler (1991, p. 46) notes, existing values about various subjects such as class, patriotism, or sex are reproduced in the “discursive interaction between the newspaper text and the reader.” In other words, for topics with which readers have a great deal of knowledge, or at least exposure, they can quite readily file new information into their existing schematic framework. A key question for this research was how does a reader’s schematic framework react when they do not “know” the significance of various codes, or worse, when there are no prevailing codes? Graber’s (1988, p. 263) work suggests that, “People whose access is limited and whose schemata are not well-developed are, therefore, more susceptible to media influence whenever they are exposed to media stories.” My experiment tested this idea that readers are potentially quite susceptible to a newspaper’s influence when they have minimal or no developed schema related to the subject matter and that this could have significant policy impacts.

Underlying the hypotheses for this research is evidence that the general public has little scientific knowledge. The National Science Foundation’s biennial Indicators reports have consistently found that Americans do not know very much about science and technology (NSF, 2002). Other research has estimated that even among college graduates, only 22 percent are scientifically literate (Hazen & Trefil, 1990). Additionally, the general public gain much of the scientific knowledge they do possess from the media, yet research consistently reveals that the media do a poor job presenting scientific information (Nelkin, 1995; Hartz & Chappell, 1997). Hence, accurate and/or consistent information about science is not part of the prevailing codes between readers and newspapers. The lack of scientific literacy combined with poor or absent media coverage means that readers do not likely have well-developed schema for scientific information relevant to river management. Therefore, I hypothesized that language and tone within news articles presenting such information would strongly influence reader perceptions

and opinions concerning concomitant policy issues. This experiment used news about ecological impacts from the 1993 Upper Mississippi River flood to test this hypothesis.

## **METHOD**

I began with an article that appeared in the *Quad-City Times* (Davenport, Iowa) in August 1993. From among the hundreds of articles about the flood I selected one that attempted to broadly cover the ecological effects of flooding and touched upon some human factors relevant to the flood's effects in the Quad-Cities of Illinois and Iowa. I selected the Quad-Cities because this area received significant flooding that summer, but not as much national press coverage as more southern locales such as St. Louis, Missouri. Additionally, I conducted this experiment in New Mexico where few respondents would be familiar with the Quad-Cities or the specific impacts from the flood and hence were even less likely to have developed schema for this location or this issue.

After selecting the article, I asked several biologist/ecologists, including some cited in the article, to review the piece and provide comments on its accuracy and completeness. General consensus among these scientists was that the article was accurate, but incomplete. They noted that the article was weak in presenting key ecological information about flooding and lacked context concerning the human role in managing the floodplain. Based on this input, I manipulated the language in the original piece to create four new articles that were either more positive or more negative about the flooding impacts than the original article (control) and more certain or more uncertain about how well experts understood those impacts. The positive language manipulations emphasized the "naturalness" of flooding processes and their importance to ecological health in river systems. The negative manipulations emphasized the "devastating" impacts from flooding and attributed them largely to human perception and interference. The certain/uncertain changes were more subtle, for example, changing "may" to

“will” or “certain” to “believe.” These changes were designed to make an article seem more certain or more uncertain about how well scientists understand impacts from flood events.

The primary goal in these manipulations was to change the general content as little as possible from the control while simultaneously altering the language and tone. The most significant changes appear early in the article to set the overall tone. The following excerpts provide examples of the kinds of changes made in the four manipulated articles. These segments appear within the first five paragraphs and represent the most extensive differences among the articles. Other changes to the original were limited to single words or short phrases.

Original:                   Biologists are less certain how many trees will die from the long-standing water that compressed tree roots and prevented leaves from taking in carbon dioxide. It will be next spring before the survivors testify to their endurance with new, green shoots.

                                  But most biologists are not overly concerned about the flood’s effects on wildlife. Wildlife has survived countless floods and will do so in the future.

Positive/Uncertain: Biologists are not sure how existing trees will fare from the long-standing water that likely compressed tree roots and impeded the leaves’ ability to take in carbon dioxide. They will begin to understand the impact next spring when the survivors testify to their endurance with new, green shoots.

                                  Most biologists, however, are not overly concerned about this flood’s effects on wildlife. Wildlife has survived countless floods and will do so in the future.

                                  ‘The old river’s pretty adaptable. Flooding is all part of the natural system that’s been going on a million years before we tried to tame the river,’ said Don Sallee of the Illinois Department of Conservation. In fact, Sallee notes

that floods remove sediment buildup, distribute nutrients and increase fish populations.

Negative/Certain: 'This is a natural disaster made worse by man,' said Phil Covington, wildlife management biologist at the Ted Shanks Wildlife Area.

Biologists are less certain how many trees may die from the long-standing water that compressed tree roots and prevented leaves from taking in carbon dioxide. It will be next spring before they know how many perished.

After creating the new articles I developed a questionnaire to ascertain whether the manipulations influenced reader opinion about the impacts that floods have on wildlife and habitat as well as their opinion about whether the impacts are well understood. Additionally the questionnaire included four statements to assess the influence that the manipulations had on reader opinion regarding flood-related river management.

To help ensure a diverse respondent group and to access relatively large numbers of individuals at one time, I requested permission from the 2<sup>nd</sup> Judicial Court in New Mexico to conduct the experiment with potential jurors during their orientation session. The chief judge granted permission and in March and April 1999 I attended jury orientation and asked the potential jurors to participate in this study. I randomly distributed the five articles (one control, four manipulated) and asked them to read their article and respond to the questionnaire. I distributed 405 and received back 308 completed questionnaires evenly distributed among the five articles. The respondent group was 56 percent male, 52 percent were between 35 and 54 years old, and 60 percent had some college experience or a bachelor's degree. I entered the data from the questionnaires into Statview to conduct statistical analyses.

## RESULTS

*Responses to impacts question:*

*Which of the following responses best represents your understanding of the information in the article?*

- a. Floods are mostly devastating to habitat and wildlife.*
- b. Floods have some negative impacts, but are mostly neutral or positive events for habitat and wildlife.*

The positive/negative article construct effectively elicited reader response in the expected direction. The questionnaire gave respondents two statements: “floods are mostly devastating to habitat and wildlife” (negative statement) and “floods have some negative impacts but are mostly neutral or positive events for habitat and wildlife” (positive statement) and asked them to select which statement best reflected their impression of flooding impacts based on the information presented in the article that they read. Of the 239 respondents who read manipulated articles and responded to the impacts question, 74 percent selected the statement that agreed with the article type they read. That is, if they read an article manipulated to be “positive,” the respondent selected the “positive” statement on the questionnaire. The negative article was especially effective and 81 percent of negative article readers selected the negative statement.

There were 61 readers whose response to the positive/negative test question did not correlate with the manipulated article they read. One possible explanation for this result is that some people may have simply answered the questions randomly and/or did not actually read the article. Another possibility is that these readers did have an existing schema into which this information flowed and this produced unexpected responses. The differences among respondents who read the control (original) article were not statistically significant, although there was a slight tendency for these readers to say that floods are devastating.

### *Responses to certainty question*

*Based on the information in the article, which statement do you think is more accurate?*

- a. The flood's impacts on habitat and wildlife are well understood.*
- b. The flood's impacts on habitat and wildlife are poorly understood.*

The certain/uncertain construct proved far less effective. The 240 respondents who read manipulated articles and responded to the certain/uncertain test statement were evenly split as to whether they answered in the expected direction or the opposite direction. The control responses were fairly evenly split for this test question with 46 percent saying that the flood's impacts are well understood (certain) and 51 percent responding that the flood's impacts are poorly understood (uncertain). Clearly the slight word changes in the manipulated articles to make the information seem more or less certain did not definitively alter readers' perceptions of how well or how poorly flooding impacts are understood. There are several possible explanations for this. One is that the level of language manipulation (e.g. "might" to "will") was too subtle to influence reader response. Therefore, instead of taking cues from the "certain/uncertain" language they relied on other information and/or their own biases in responding. Another possibility is that the amount of information the article provided (i.e. the number of individual resources mentioned and the number of scientists cited) may have led some readers to believe that the impacts are well understood while convincing others that there is confusion or a lack of understanding.

There was a significant correlation between perceptions of flooding impacts as positive or negative and responses to how well those impacts are understood. Respondents who believed that, "floods have some negative impacts but are mostly neutral or positive events for habitat and wildlife," were much more likely to say that those impacts are well understood (Table 1). As already noted, there was no correlation between the articles manipulated to be certain or uncertain and reader responses to how well impacts are understood. This implies that the language used to create the positive or negative tone had more influence on readers'

perceptions about how well flooding impacts are understood than did the certain/uncertain language manipulations.

*Responses to policy statements:*

*Flood control measures (e.g. levees) should be built so that wildlife areas do not flood.*

*Floods should be allowed to run their natural course, even through wildlife areas.*

*Public funds should be used to restock depleted wildlife populations.*

*Public funds should be used to restore habitats (e.g. plant trees, grasses).*

In assessing the potential impact on policy, the results showed that the particular article a participant read correlated with how they responded to the various river management options. To better understand the role that the language manipulation may have played in reader responses, I removed the 57 controls from the analyses as well as those responses from the 61 readers whose opinion about flooding impacts did not agree with the article they read. As noted, some of these “non-agreeing” readers may not have actually read the article or may have answered randomly and hence would not fairly represent the article’s impact. The results reported here however, remain statistically significant with the 61 non-agreeing responses included.

Readers were given a six-item response scale for the four policy statements: Agree Strongly, Agree, Agree Somewhat, Disagree Somewhat, Disagree, Disagree Strongly. Responses to the first statement, “Flood control measures (e.g. levees) should be built so that wildlife areas do not flood,” correlated well with reader perceptions about whether floods are positive or negative. Of the participants who read negative articles *and* said that flooding impacts are negative, 78 percent supported control (Figure 1). A clear majority (65 percent) of the positive article readers disagreed at some level with the control statement.

The distribution of responses for the second policy statement, “Floods should be allowed to run their natural course, even through wildlife areas,” also correlated with the article that respondents read. Of the positive group 88 percent agreed that floods should run their course (Figure 2). Responses from the negative group were more evenly divided between the “agree”

and “disagree” categories for this statement. The majority (53 percent), however, agreed at some level that floods should run their course despite the negative impacts. This indicates that overall, there is support for allowing rivers to run and the article language perhaps further emphasized this sentiment for those readers who read the positive article and tempered it for those who read the negative article.

To check for consistency among reader responses, I analyzed the relationship between these first two policy statements. In a perfect relationship, each respondent who “strongly agreed” with controlling floods would have “strongly disagreed” with allowing floods to run their course and respondents who “agreed” with controlling floods would have “disagreed” with allowing floods to run their course and so on for each measurement category. Responses from this experiment tend toward this perfect relationship (Table 2). The largest individual category includes respondents who selected the “agree somewhat” or “disagree somewhat” options. Among those 85 respondents, most (52 percent) “agreed somewhat” with one policy statement and “disagreed somewhat” with the other. Another 47 percent answered “agree somewhat” for both policy statements, while a single person “disagreed somewhat” with both statements. The next largest category were the 56 respondents who wanted floods to take their natural course and disagreed with the need for control, again fitting the pattern expected in a perfect relationship. Among the 100 readers who supported control, 36 disagreed with allowing the river to run, but 44 readers were more ambivalent and responded in the “somewhat” category and these were evenly split between “agreeing somewhat” and “disagreeing somewhat.” To some extent, these responses reflect a “we want it all” approach that would perhaps balance control with allowing the river to run, but the article manipulations apparently pushed readers toward a response that correlates with the language in the article they read.

The other two policy statements included in the questionnaire were designed to assess how receptive people were to spending tax dollars on flood-related restoration. The statements

targeted specific information in the articles about the lack of wildlife replacement programs and the potential habitat loss for various species.

I found strong relationships between readers' perceptions of flooding impacts and their responses to the wildlife restocking and the habitat restoration statements. Of respondents who read negative articles 82 percent agreed that, "Public funds should be used to restock depleted wildlife populations." Comparatively, only 47 percent of the respondents who read positive articles supported restocking efforts (Figure 3). This pattern holds true for responses to the statement "Public funds should be used to restore habitats (e.g. plant trees, grasses)." About 87 percent of the respondents in the negative group compared to 67 percent in the positive group agreed with that statement (Figure 4). Again, readers supported rehabilitation efforts in general, but the article type seems to have influenced response strength.

There were no statistically significant relationships between the certain/uncertain manipulations and the four policy statements.

## **DISCUSSION**

Clearly, how reporters and editors present information has the power to influence reader opinion and could potentially affect policy decisions. At the same time, there seems to be a threshold or thresholds at which language plays a role in affecting reader response. The positive/negative construct, with its more overt and extensive manipulations, was quite effective while the more subtle changes concerning certainty or uncertainty did not influence reader perceptions about how well impacts are understood or their opinion on policy decisions. Assessing this threshold factor is an area ripe for continued research.

Results for the more overt language manipulations show that while respondents showed general support for restocking and even more for habitat rehabilitation efforts, the article tone did influence response strength. This provides evidence that the specific words and phrases selected for a news article have the power to sway public response in cases where readers

likely have little background, and hence undeveloped schema for the subject. In this experiment, respondents who read the positive article were much less inclined to support flood control and more likely to believe that the flooding impacts are well understood. The positive language, characterizing flooding as natural and beneficial seemed to create a “nature will take care of itself” attitude, which precluded a need for human intervention. Additionally, the more positive language perhaps imbued a sense of confidence among readers and led them to conclude that the flooding impacts are well understood as well as “natural.”

The negative approach seemed to encourage people to want to do something to remedy the situation. Interestingly, the negative article evoked a desire for more control, even though the article clearly blamed past engineering efforts for the level of damage brought with the flood. Perhaps this reflects a sense of guilt and therefore a desire to do something, but without understanding the ecological (as well as social) context, readers fall back on traditional control methods to “fix” flooding.

These results document that media coverage has the potential to influence policy in terms of swelling public support for or opposition to various management decisions. On one hand, emphasizing the “natural” approach to flooding highlights the ecological aspects pertinent to flooding, but may ignore the human context in which modern floodplains exist. On the other hand, characterizing the flood as “devastating” and blaming human intervention provides context for flooding impacts, but may allow readers to ignore science and the important role that flooding plays in maintaining healthy river ecosystems. As the scientists who commented on the control article told me, key shortcomings in most flood related news articles are a lack of information about river processes and a lack of context about how human intervention has influenced these processes. At a broader level, these concerns are at the crux of media coverage about all natural resource issues. Perhaps one step toward more complete, more complex coverage is to improve the relationships between scientists and journalists. The existing literature provides excellent guidance for helping journalists and scientists work

together to improve media coverage (cf Hartz and Chappell, 1997; Cockerill, 2002). Balancing the scientific evidence with human-focused context is a challenge for writing about natural resources and their management. Encouraging scientists and journalists to establish a rapport with each other, to begin to better understand the nuances within each of their respective disciplines, is a key element in developing more complete coverage of natural resources issues and hence potentially influencing public perceptions about management options. Helping both journalists and scientists better understand the role that media coverage plays in influencing public attitudes should help improve our ability to present information with scientific accuracy and with appropriate context and thereby provide an atmosphere for more informed policy decisions.

## **ACKNOWLEDGEMENTS**

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Table 1

	<u>Perception of Flooding Impacts</u>		
	<u>Positive</u>	<u>Negative</u>	<u>Total</u>
<u>Flood Impacts Understood</u>			
Well Understood	80	50	130
Poorly Understood	44	59	103
Total	129	109	233
p=.004			

Table 2

	<u>Control Floods</u>			
	<u>Agree</u>	<u>Somewhat</u>	<u>Disagree</u>	<u>Total</u>
<u>Allow to Run</u>				
Agree	20	39	56	115
Somewhat	44	85	12	141
Disagree	36	9	1	46
Total	100	133	69	302

Figure 1: Responses to the policy statement, “Flood control measures (e.g. levees) should be built so that wildlife areas do not flood,” grouped by article/response type. (n=178, p=.0001)

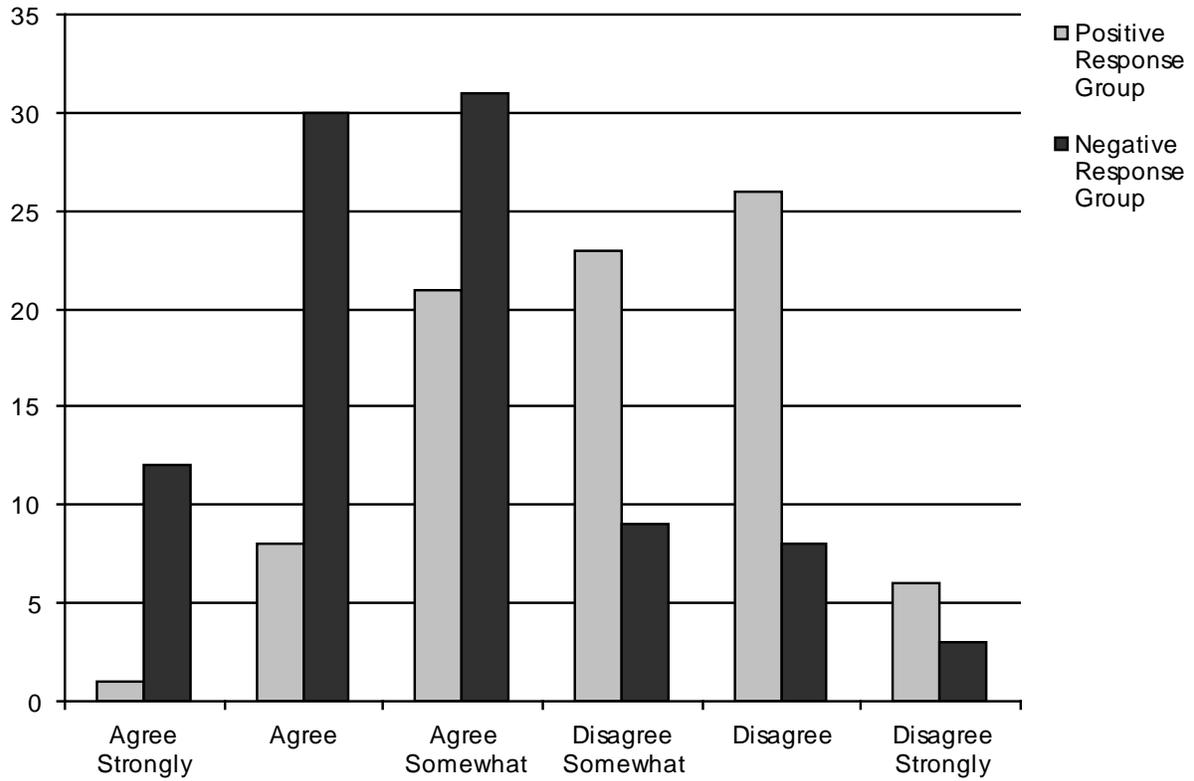


Figure 2: Responses to policy statement, "Floods should be allowed to run their natural course, even through wildlife areas," grouped by article/response type. (n=178, p=.0001)

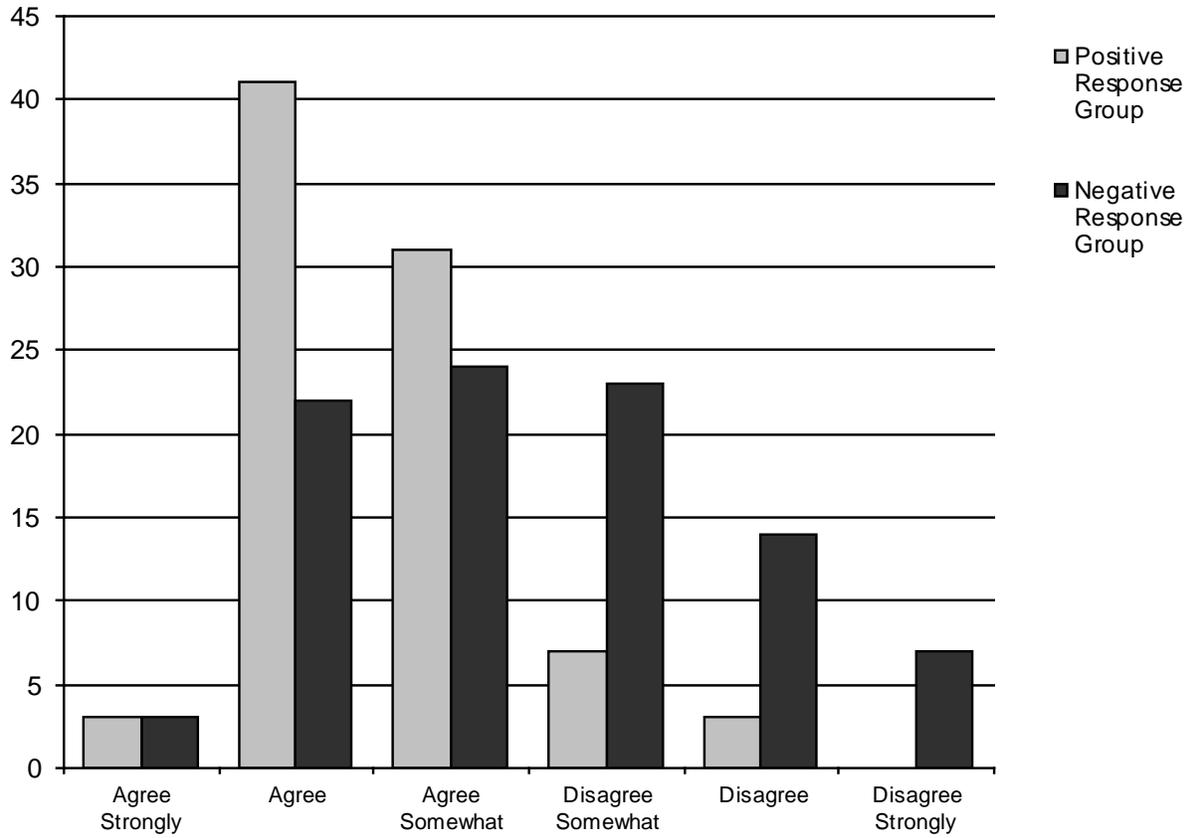


Figure 3: Responses to policy statement, "Public funds should be used to restock depleted wildlife populations," grouped by article/response type. (n=177, p=.0001)

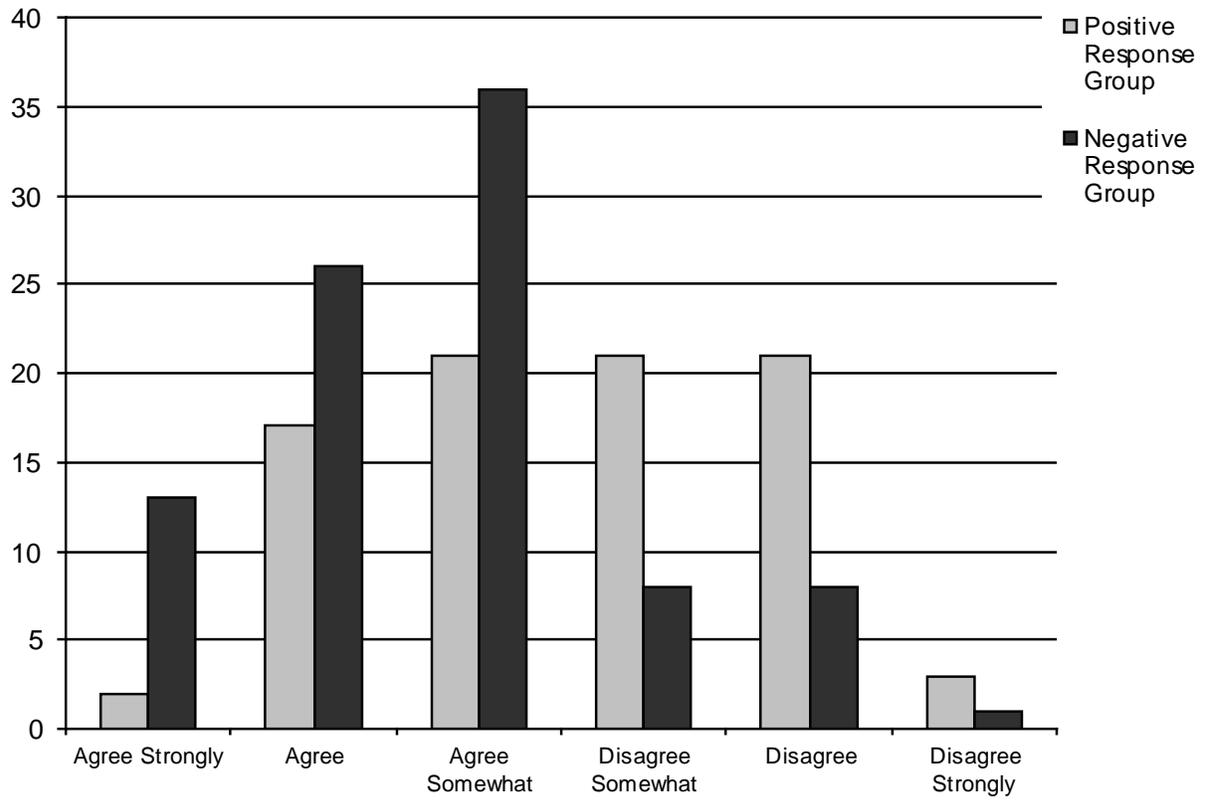


Figure 4: Responses to policy statement, "Public funds should be used to restore habitats (e.g. plant trees, grasses)," grouped by article/response type. (n=176, p=.0001)

