

Trust, Bias, and Fairness of Information Sources for Biotechnology Issues

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What do journalists think about information source trustworthiness, bias, and fairness in communicating agricultural biotechnology issues? Fifty Texas journalists and 40 national agriculture journalists representing newspapers and television media responded to this study. Journalists believed university scientists/researchers and newspapers were trustworthy, unbiased, and fair, while activist groups were untrustworthy, completely biased, and unfair in communicating agricultural biotechnology issues. They were most opposed to public opinion outweighing scientists' opinions when making decisions about scientific research. A substantial positive correlation occurred between national agriculture journalists' attitudes toward democratic processes in science (i.e., the extent that public opinion is considered in scientific decision-making processes) and trust in newspapers.

Key words: bias, biotechnology concerns, fairness, information sources, trustworthiness.

Introduction

The journalism profession is in the news (no pun intended). Recent accounts of journalists' "myopic zeal" created public debate nationwide and damaged the credibility of some journalists, to the extent that a broadcast was deemed "incomplete or unfair" (Wulfhorst, 2005). Journalism professionals probably do not have a greater likelihood of making judgment errors or miscalculating the validity of their information sources than do other professionals, but when errors or miscalculations happen, journalists suffer greater public scrutiny of their work. Some media claim their news stories are based on fair and balanced reporting. That said, it behooves journalists to consider the trustworthiness, bias, and fairness of information sources used to gather and form the news, especially when reporting on agricultural biotechnology issues.

What is known about the sources journalists use to gather facts, form conclusions, and report their stories? What is known about journalists' perceptions of the credibility of their information sources, especially when forming reports that are highly scientific, such as is the case for reporting newsworthy pieces on agricultural biotechnology practices? Wingenbach, Rutherford, and Dunsford (2003) found that college of agriculture students (future agricultural communicators) had greatest faith in statements about biotechnology when made by university scientists and had least faith in statements made by celebrities. Vestal and Briers (2000) found:

[Metro news] journalists had high levels of faith (i.e., accurate and unbiased) in statements about

food biotechnology from university scientists and health professionals. Journalists' faith in statements made by government agencies and farm groups were neutral. They rated their faith lower for statements made by biotechnology companies and food companies, and "very low" for statements made by celebrities. (p. 139)

Hoban (1999) found that North American consumers trusted independent health and scientific experts most, while European consumers placed the most trust in consumer and environmental groups. A study by the National Science Foundation (NSF, 2000) found that only 11% of scientists reported having a great deal of confidence in the press, and 22% said they had hardly any confidence; in the same study, 35% of journalists reported having a great deal of confidence, while 4% reported they had hardly any confidence in the press.

Brossard and Shanahan (2003) established sound connections between "citizens' media use and their views of democratic processes in science by measuring institutional trust, scientific knowledge, and fears and concerns related to science and biotechnology" (p. 291). A democratic process in science, as utilized by Brossard and Shanahan, refers to the extent that public opinion is considered in scientific decision making. Brossard and Shanahan found that more educated respondents (in New York state) tended to trust activist groups less and were less fearful of science in general. Those who were more educated watched less television but paid more attention to biotechnology on television and in the

newspaper, mirroring the NSF's (2000) finding that "most of what Americans know about science and technology comes from watching television or reading a newspaper" (p. 25).

As for media and bias, Marks and Kalaitzandonakes (2001) confirmed media bias (in reporting events pertaining to agrobiotechnology) "in so far as media coverage emphasized different frames (biosafety and food safety) at different points in time, depending on unfolding events and scientific and risk management controversies" (p. 206). However, not all media are in error when considering Logan's (2001) viewpoint that "food biotechnology news often has been perceived as an agriculture food or business story, instead of a science, environment, or investigative story" (p. 194). Certainly, a mismatch in beat reporting may affect the outcome of an agricultural biotechnology news story, but what remains uncertain are journalists' perceptions of trustworthiness, bias, and fairness in communicating agricultural biotechnology issues from the information sources they use to develop stories. The question remains: What information sources do journalists (Texas and nationally) consider trustworthy, unbiased, and fair in communicating agricultural biotechnology issues?

Purpose and Objectives

The purpose of this study was to examine information source trustworthiness, bias, and fairness in communicating agricultural biotechnology issues, as perceived by journalists in Texas and nationally. The purpose was accomplished by:

1. collecting journalists' perceptions of information source trustworthiness, bias, and fairness in communicating agricultural biotechnology issues;
2. gathering journalists' levels of concern about agricultural biotechnology issues;
3. gathering journalists' attitudes toward democratic processes in science; and
4. exploring relationships between journalists' perceptions of information source trustworthiness, bias, and fairness and their concerns about agricultural biotechnology issues or attitudes toward democratic processes in science.

Methods

Descriptive survey methods and a correlational design were used in this study. Web-based survey data collection procedures (Ladner, Wingenbach, & Raven, 2002) were used to collect the data after obtaining approval to

conduct the study from the Texas A&M University Institutional Review Board (#2003-0034).

The target population consisted of professional journalists (editors or managing editors from daily/weekly newspapers; news directors or editors from local and cable television outlets) employed in a Texas media market ($N = 731$) and national agriculture journalists (editors or managing editors) employed by a weekly newspaper ($N = 184$). Texas daily newspaper circulation rates ranged from 2,800 to 510,000; weekly circulation rates ranged from 600 to 315,000. Texas television markets ranged from city (e.g., Victoria) to metropolitan (e.g., Houston) areas. National agriculture newspapers were represented by 36 states, the District of Columbia, and Puerto Rico, with circulation rates from 3,200 to 372,000. Bacon's MediaSource (2004) was used to define the target population ($N = 915$) in summer 2004. A proportional stratified random sample (Borg & Gall, 1989), using methods suggested by Bartlett, Kotrlík, and Higgins (2001), was derived from the Bacon's list to ensure equal representation across all subgroups.

Modified versions of two instruments, College Students' Perceptions of Biotechnology (Wingenbach et al., 2002, 2003) and Media, Agricultural Biotechnology and Authoritarian Views of Democratic Processes in Science (Brossard & Shanahan, 2003), were used to create the research instrument; wording changes and question sequencing constituted the modifications. Content validity was established by a panel of agricultural communications and journalism experts from Texas A&M University.

The instrument, Journalists' Perceptions about Biotechnology Issues, contained five multipart questions (for the results reported in this paper) measuring journalists' perceptions of information source trustworthiness, bias, and fairness in communicating agricultural biotechnology issues; concerns about agricultural biotechnology issues; and attitudes toward democratic processes in science. A final section of the instrument collected demographic information. Trustworthiness, bias, and fairness scales included the same nine sources (activist groups, biotechnology industry representatives, farmer/rancher groups, retail food companies, government officials, university scientists/researchers, Internet, newspapers, and television) and had similar four-point Likert scales (descriptors changed between scales).

Reliability analyses for the scale measuring trustworthiness of information source (1 = *completely untrustworthy* through 4 = *completely trustworthy*) revealed a Cronbach's alpha coefficient of .74; the bias of information source scale (1 = *completely biased*

through 4 = *completely unbiased*) had a Cronbach's alpha coefficient of .64; and the fairness of information source scale (1 = *completely unfair* through 4 = *completely fair*) had a coefficient of .84. Each item from the three scales (trustworthiness, bias, and fairness) was transformed as a single additive index so an overall "trust" indicator could be ascertained for each source (Brossard & Shanahan, 2003). The resultant information source trust indicators were used in bivariate analyses.

Concerns about agricultural biotechnology issues were measured with eight four-point items ranging from 1 (*very unconcerned*) to 4 (*very concerned*) and were transformed into a single additive index for bivariate analyses. A Cronbach's alpha coefficient of .86 was revealed for the concerns scale. The attitudes toward democratic processes in science scale were measured by four four-point items ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) with a coefficient of .71 and were similarly converted to a single additive index for bivariate analyses. The scales used in this study provided reliable data for analyses and interpretation.

Pre-notice letters describing the study were sent via regular postal service to all participants in the stratified random sample. One week later, electronic mail notes were sent to all participants (editors, managing editors, and news directors/editors) with a hyperlink to the online instrument; participants were asked to identify at least one writer or reporter to participate in the study. Respondents accessed the instrument through a closed Web address. Respondents were instructed to read and agree to an Informed Consent Form before entering the survey site. Data collection began in mid-August and was completed in six weeks. Weekly email reminders and formal letters requesting participation were sent as follow-up procedures for mixed-mode surveys (Dillman, 2000) to all nonrespondents.

A total of 96 responses (31.48%) were collected following suggested data collection procedures (Dillman, 2000); however, incomplete data reduced the usable number of respondents to 90 (29.51%). Of those who responded, 50 represented the Texas media group (overall response was 20.7%) and 40 represented the national agriculture weekly newspaper group (overall response was 43.5%). Sixty-three respondents from the Texas media sample ($n = 305$) and eight respondents from the national agriculture media sample ($n = 100$) opted to not participate in the study. Babbie (2001) suggested a 50% response rate for adequate statistical analyses, but others (Keeter, Miller, Kohut, Groves, & Presser, 2000) disagree with this estimate. Keeter et al. found little differences in two identical response rates (60.6% versus

36%) for most attitudinal measures with attention to media variables.

Descriptive statistics were derived for each section and the instrument as a whole. Demographic data were analyzed using percentages and frequencies. Significant relationships between selected variables were established using bivariate analyses.

Findings

Total responses ($N = 90$) were from journalists in 16 states, the District of Columbia, and Puerto Rico (Table 1). Respondents were well-educated, male, and under 50 years of age. They were predominately Caucasian, represented daily newspapers, and were newspaper editors ($n = 34$) or managing editors ($n = 23$).

Perceptions of Information Source Trustworthiness, Bias, and Fairness

Journalists responded to three multipart questions designed to collect their perceptions of nine information sources' trustworthiness, bias, and fairness in communicating agricultural biotechnology issues (Table 2). Results are sorted by descending total grand means.

Overall, journalists perceived university scientists/researchers as trustworthy ($M = 3.21$, $SD = 0.53$), unbiased ($M = 2.85$, $SD = 0.70$), and fair ($M = 3.18$, $SD = 0.53$) in communicating agricultural biotechnology issues. They felt essentially the same about newspapers, as being trustworthy ($M = 2.86$, $SD = 0.47$), unbiased ($M = 2.81$, $SD = 0.55$), and fair ($M = 2.91$, $SD = 0.52$) in communicating agricultural biotechnology issues. Likewise, they agreed as a group that activist groups were untrustworthy ($M = 1.98$, $SD = 0.56$), completely biased ($M = 1.41$, $SD = 0.54$), and unfair ($M = 1.88$, $SD = 0.67$) in communicating agricultural biotechnology issues (Table 2).

Concerns About Agricultural Biotechnology Issues

Journalists rated their levels of concern about agricultural biotechnology issues (Table 3). They were concerned ($M = 3.01$ – 3.27) about all eight issues identified by Brossard and Shanahan (2003). They were concerned about the consequences that agricultural biotechnology would have in farming and food production ($M = 3.27$, $SD = 0.65$), followed by the low level of public knowledge ($M = 3.20$, $SD = 0.58$) and human health risks and safety issues ($M = 3.20$, $SD = 0.74$). Texas journalists were most concerned with human health risks and safety issues ($M = 3.30$, $SD = 0.74$), while national agriculture

Table 1. Demographic frequencies of respondents.

Variables		Texas (n = 50)		Nat. ag. ^a (n = 40)		Total (N = 90)	
		f ^b	%	f ^b	%	f ^b	%
Gender	Male	28	33.3	22	26.2	50	59.5
	Female	17	20.2	17	20.2	34	40.5
Education	Bachelor of science	33	66.0	37	92.5	70	77.8
	Master of science	9	18.0	2	5.0	11	12.2
	High school diploma or equivalent	4	8.0			4	4.4
Age	30–39	11	12.9	15	17.6	26	30.6
	40–49	15	17.6	7	8.2	22	25.9
	50–59	10	11.8	9	10.6	19	22.4
	< 30	6	7.1	3	3.5	9	10.6
	60 >	4	4.7	5	5.9	9	10.6
Race	White/Caucasian	36	42.4	37	43.5	73	85.9
	Hispanic American	8	9.4	1	1.2	9	10.6
	Other (Chinese, Native American)	2	2.4	—	—	2	2.4
	African American	—	—	1	1.2	1	1.2
Media outlet type	Daily newspaper	14	28.0	39	97.5	53	58.9
	Weekly newspaper	24	48.0	1	2.5	25	27.8
	Television	12	24.0	—	—	12	13.3
Respondent media role	Editor/TV news director	23/5	56.0	11	27.5	39	43.3
	Managing editor/TV news editor	7/5	24.0	16	40.0	28	31.1
	Writer/TV reporter	8/2	20.0	13	32.5	23	25.6

^a States included Arizona, California, Colorado, Georgia, Iowa, Kentucky, Michigan, Minnesota, Missouri, North Carolina, Nebraska, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas, the District of Columbia, and Puerto Rico.

^b Frequencies may not equal 100% because of missing data.

journalists were concerned about the consequences for farming and food production ($M = 3.35$, $SD = 0.62$).

Attitudes Toward Democratic Processes in Science

Journalists were asked how much they agreed with four statements measuring authoritarian attitude toward democratic processes in science (Brossard & Shanahan, 2003; see Table 4). They disagreed ($M = 1.85$ – 2.41) with all four statements. As a group, they were most opposed to the thought of public opinion outweighing scientists' opinions when making decisions about scientific research ($M = 1.85$, $SD = 0.55$). They were least opposed to the idea that it is important to have public participation in making scientific decisions, regardless of people's knowledge of the issues involved ($M = 2.41$, $SD = 0.70$).

Relationships Between Information Source Trust and Concerns and/or Attitudes

Respondents' perceptions of information source trust (trustworthiness, bias, and fairness) were transformed

into single additive indices (Table 5) so overall trust indicators could be determined for each source (activist groups, biotechnology industry representatives, farmer/rancher groups, retail food companies, government officials, university scientists/researchers, Internet, newspapers, and television). Also, summated scores for their concerns about agricultural biotechnology issues ($M = 24.64$, $SD = 4.19$), and attitudes toward democratic processes in science ($M = 8.42$, $SD = 1.94$) were converted into single additive indices and correlated with their information source trust indices (Table 5). Relationships were described based on the conventions proposed by Davis (1971).

The most notable significant relationship was a substantial positive correlation between national agriculture journalists' attitudes toward democratic processes in science and trust in newspapers ($r = .56$, $p < .01$); the same group also had moderate correlations between their attitudes and trust in television ($r = .47$, $p < .01$) and biotechnology industry representatives ($r = -.42$, $p < .01$). As a group, two significant low correlations

Table 2. Journalists' perceptions of information source trustworthiness, bias, and fairness.

Information source trust indicators		Texas (n = 50)		Nat. ag. (n = 40)		Total (N = 90)	
		M	SD	M	SD	M	SD
Trustworthy ^a	University scientists/researchers	3.17	0.60	3.26	0.44	3.21	0.53
	Newspapers	2.87	0.54	2.83	0.38	2.86	0.47
	Farmer/rancher groups	2.76	0.43	2.72	0.56	2.74	0.49
	Government officials	2.30	0.66	2.64	0.54	2.46	0.63
	Biotechnology industry representatives	2.30	0.63	2.51	0.56	2.40	0.60
	Internet	2.32	0.64	2.24	0.74	2.28	0.68
	Retail food companies	2.15	0.67	2.34	0.58	2.24	0.63
	Television	2.39	0.68	2.03	0.81	2.23	0.76
Biased ^b	Activist groups	2.00	0.60	1.95	0.51	1.98	0.56
	University scientists/researchers	2.88	0.79	2.83	0.59	2.85	0.70
	Newspapers	2.87	0.50	2.74	0.59	2.81	0.55
	Television	2.45	0.62	2.11	0.82	2.30	0.73
	Government officials	2.02	0.67	2.41	0.50	2.20	0.63
	Internet	2.17	0.64	2.08	0.62	2.13	0.63
	Farmer/rancher groups	2.06	0.52	2.17	0.50	2.11	0.51
	Retail food companies	1.79	0.62	2.00	0.55	1.89	0.60
Fairness ^c	Biotechnology industry representatives	1.50	0.58	1.70	0.56	1.59	0.58
	Activist groups	1.46	0.58	1.35	0.48	1.41	0.54
	University scientists/researchers	3.20	0.61	3.15	0.43	3.18	0.53
	Newspapers	2.96	0.35	2.84	0.68	2.91	0.52
	Farmer/rancher groups	2.65	0.56	2.53	0.64	2.59	0.60
	Government officials	2.44	0.65	2.70	0.52	2.56	0.60
	Television	2.74	0.53	2.28	0.66	2.54	0.63
	Internet	2.42	0.66	2.24	0.64	2.34	0.65
Retail food companies	2.32	0.63	2.33	0.72	2.33	0.66	
Biotechnology industry representatives	2.21	0.68	2.28	0.68	2.24	0.68	
Activist groups	2.04	0.71	1.68	0.57	1.88	0.67	

^a Four-point Likert scale: 1 = completely untrustworthy, 2 = untrustworthy, 3 = trustworthy, 4 = completely trustworthy

^b Four-point Likert scale: 1 = completely biased, 2 = biased, 3 = unbiased, 4 = completely unbiased.

^c Four-point Likert scale: 1 = completely unfair, 2 = unfair, 3 = fair, 4 = completely fair.

Table 3. Journalists' concerns about agricultural biotechnology issues.

Issues	Texas (n = 50)		Nat. ag. (n = 40)		Total (N = 90)	
	M	SD	M	SD	M	SD
Consequences for farming and food production	3.20	0.68	3.35	0.62	3.27	0.65
Low level of public knowledge	3.16	0.62	3.25	0.54	3.20	0.58
Human health risks and safety issues	3.30	0.74	3.08	0.73	3.20	0.74
Scientific uncertainty about biotechnology's consequences	3.20	0.78	2.92	0.70	3.08	0.76
Potential risks for the environment	3.04	0.89	3.05	0.75	3.04	0.82
Economic implications	2.92	0.61	3.18	0.59	3.03	0.61
Ethical implications	3.04	0.73	2.98	0.70	3.01	0.72
International and global implications	2.92	0.79	3.13	0.61	3.01	0.72

Note. Four-point Likert scale: 1 = very unconcerned, 2 = unconcerned, 3 = concerned, 4 = very concerned.

Table 4. Journalists' attitudes toward democratic processes in science.

Statements	Texas (n = 50)		Nat. ag. (n = 40)		Total (N = 90)	
	M	SD	M	SD	M	SD
It is important to have public participation in making scientific decisions, regardless of people's knowledge of the issues involved.	2.36	0.68	2.49	0.73	2.41	0.70
Scientists should pay attention to the wishes of the public, even if they think citizens are mistaken or do not understand their work.	2.36	0.74	2.44	0.72	2.39	0.73
The actions of the scientific community should always reflect the will of the majority.	1.98	0.75	1.77	0.58	1.88	0.68
Public opinion is more important than scientists' opinions when making decisions about scientific research.	1.80	0.62	1.90	0.45	1.85	0.55

Note. Four-point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.

Table 5. Pearson correlations between journalists' concerns about agricultural biotechnology issues, attitudes toward democratic processes in science, and information source trust.

Variables	Texas (n = 50)		Nat. ag. (n = 40)		Total (N = 90)	
	r ^{d1}	r ^{d2}	r ^{d1}	r ^{d2}	r ^{d1}	r ^{d2}
1. Concerns about agricultural biotechnology issues ^a	—		—		—	
2. Attitudes toward democratic processes in science ^b	.19	—	.29	—	.22*	—
Information source trust indicators ^c						
University scientists	.16	-.03	-.25	-.38*	.03	-.14
Newspapers	.31*	.18	.11	.56**	.21	.32**
Farmers/ranchers	.01	.30*	-.23	-.29	-.09	.06
Television	.06	-.06	-.05	.47**	.00	.15
Food retail comp.	-.03	.20	-.34*	.17	-.16	.18
Biotechnology reps	-.16	.25	-.34*	-.42**	-.22*	.00
Activist groups	.29*	.30	.12	.27	.22*	.28*

Note. Four-point Likert scales were summated to determine journalists' perceptions of information source trust, concerns about agricultural biotechnology issues, and attitudes toward democratic processes in science.

^a Concerns about biotechnology issues ranged from 8 to 32.

^b Attitudes toward democratic processes in science ranged from 4 to 12.

^c Information source trust indicators ranged from 2 to 12.

^d Interval variables; reported as Pearson correlations.

*p < .05. **p < .01.

existed between concerns about agricultural biotechnology issues and biotechnology industry representatives ($r = -.22, p < .05$) and activist groups ($r = .22, p < .05$).

A moderate positive correlation occurred between attitudes toward democratic processes in science and trust in newspapers ($r = .32, p < .01$). A low positive correlation occurred between attitudes and trust in activist groups ($r = .28, p < .05$). To conserve space, only significant relationships are presented in Table 5. (No significant correlations for Internet or government officials were evident in the analyses.)

Implications and Recommendations

It is reassuring to know that journalists in this study found university scientists/researchers and newspapers as trustworthy, unbiased, and fair in communicating

agricultural biotechnology issues. Likewise, they perceived activist groups as untrustworthy, completely biased, and unfair on the same issue. It was not surprising that newspapers were viewed in a favorable light, considering the respondent group. However, the perception of television as untrustworthy and biased in communicating agricultural biotechnology issues indicates that media professionals as a whole have concerns with one type of their profession. Several studies (Blaine, Kamaldeen, & Powell, 2002; Macer, 2001; NSF, 2000) have found that most consumers get their biotechnology information from television and newspapers. If that is true now, and there is no indication that the public will switch to other sources in the future, then television media professionals should work closely with university scientists/researchers and newspaper professionals when

crafting stories concerning agricultural biotechnology issues.

The findings in this study do not agree with Macer's (2001), who found that respondents were suspicious of safety statements (about biotechnology practices) made by scientists, and especially statements made by biotechnology companies. Macer warned:

The media have a large responsibility to communicate science, and scientists should also inform people about science. The media also have a responsibility to present balanced information, on the benefits and risks of alternative technology and to do this independently of commercial interests. (p. 120)

Blaine et al. (2002) reviewed previous biotechnology surveys and found the most commonly mentioned information sources on food-related risks were television, newspapers, and other media outlets, but these sources were not well trusted by the international public because of media coverage of food scares. Several studies in Canada and the United States (Decima Research, 1993; Einsiedel, 1997; Hoban & Kendall, 1992) found that "friends and family members play[ed] a substantial role as information providers in science and issues involving biotechnology" (as cited in Blaine et al., 2002, p. 3204). Given the influences of friends and family members on one's perception of biotechnology, media professionals become increasingly important information providers who should be trusted, unbiased, and fair in communicating agricultural biotechnology issues.

Journalists were most concerned about the consequences that agricultural biotechnology would have in farming and food production. This finding contradicts earlier studies (Blaine et al., 2002; Vestal & Briers, 2000; Wingenbach et al., 2002, 2003), where most respondents viewed agricultural biotechnology practices involving plant life as a favorable outcome of the technology. Perhaps the inclusion of "food production" was enough of an indicator for journalists to think differently about this point. Additional studies, in the form of open-ended questions, may elicit different issues of concern about the consequences of agricultural biotechnology. Clearly, one single issue has yet to be identified universally.

Respondents were most opposed to the thought of public opinion outweighing scientists' opinions when making decisions about scientific research. They were least opposed to the idea that it is important to have public participation in making scientific decisions, regard-

less of people's knowledge of the issues involved. From the scientific community's viewpoint, this is good news, although it should be tempered by thought that scientists, journalists, and officials who regulate biotechnology practices must work together to inform and shape public opinion. Brossard and Shanahan (2003) found a similar outcome from respondents in New York, in that:

Although the trend is to increase public participation in the creation of policy on controversial issues such as agricultural biotechnology, our results show that a sizable fraction of the public feels that public opinion in general, as either a product of citizen deliberation or as uninformed feelings, is less important than scientists' opinions. (p. 306)

A substantial positive correlation occurred between national agriculture journalists' attitudes toward democratic processes in science and trust in newspapers; there were moderate correlations between attitudes and trust in television (positive) and biotechnology industry representatives (negative). In other words, as national agriculture journalists' attitudes toward democratic processes in science increased, so too did their trust in newspapers and television. Conversely, as their attitudes increased, their trust in biotechnology industry representatives decreased, or vice versa. It is important to note that these are not cause-and-effect relationships, but the correlations do show a significant connection between trust in some information sources and journalists' attitudes toward democratic processes in science. Similar findings were revealed in Brossard and Shanahan's (2003) study, wherein they found that "respondents were not positive that public opinion [was] important in decision making related to scientific research" (p. 301).

Additional research of the variables in this study may further aid journalists in their quest to provide trustworthy, unbiased, and fair communications about agricultural biotechnology issues. Specifically, journalists' perceptions of the trustworthiness of an information source, and what characterizes a source as "trustworthy, unbiased, and fair," should be investigated. Likewise, similar information source investigations of trustworthiness from the perspectives of university scientists and researchers should be conducted.

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