

The Influence of Source Credibility on Attitude Certainty: Exploring the Moderating Effects of Timing of Source Identification and Individual Need for Cognition

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ABSTRACT

This research investigates the influence of source credibility on attitude certainty, referring to an individual's subjective confidence in his/her attitude. Results of a laboratory experiment ($N = 220$) show that low source credibility, compared with high source credibility, leads to greater attitude certainty. This relationship, however, only holds when the source is identified before message exposure and for people who are low in need for cognition. Theoretical and practical implications of the findings are discussed. © 2009 Wiley Periodicals, Inc.

Recent developments in persuasion research suggest that attitudes that are equally favorable may differ in their underlying strength. In other words, some attitudes are inherently “stronger” than others, even though they all possess the same degree of favorability. Attitudes with greater strength are said to be more persistent over time, more resistant to attack, and more predictive of

behaviors (Krosnick & Petty, 1995). One indicator of attitude strength is an individual's subjective confidence in his/her attitude, called *attitude certainty*.

The purpose of the current research is to provide an understanding of the situational and individual factors that influence attitude certainty. It focuses on an important construct in persuasion—source credibility. Much of previous research has been devoted to studying the impact of source credibility on attitude favorability (e.g., Gotlieb & Sarel, 1991; Lashbrook, Snavely, & Sullivan, 1977; Leong, 1990; Lord, 1994; Sternthal, Phillips, & Dholakia, 1978). What remains relatively unknown, however, is the potential influence of source credibility on attitude certainty. The current research suggests that source credibility can exert a significant influence on attitude certainty, with low source credibility leading to greater attitude certainty. It also demonstrates that timing of source identification and an individual's need for cognition are important moderators for the source credibility–attitude certainty relationship.

Source Credibility as a Determinant of Attitude Certainty

Attitude certainty is defined as the degree to which an individual is confident that his/her attitude toward an object is valid and accurately reflects his/her overall orientation toward it (Krosnick & Petty, 1995). Studies have shown that attitudes that are based on more extensive cognitive elaboration are held with greater certainty (e.g., Abelson, 1988; Miller, Gross, & Holtz, 1991). Miller, Gross, and Holtz (1991), for example, found that attitude certainty increased monotonically as a function of the number of times the attitude object was thought about.

Priester and Petty (1995, 2003) postulate and find that an untrustworthy source, compared with a trustworthy source, can lead to more message elaboration. This is because, when encountering an untrustworthy source, people will be unsure as to whether the information provided is accurate and thus will engage in greater message scrutiny to ascertain its validity. In contrast, when confronted with a trustworthy source, people will be confident that the information provided is accurate and thus will accept the message unthinkingly as valid. Presumably, the other dimension of source credibility—source expertise—should have a similar effect on message elaboration. Specifically, if a source has low expertise, people will be likely to engage in more extensive message elaboration to ascertain the validity of the information. On the other hand, if a source has high expertise, people will be likely to accept the message as valid without much thinking.

Since attitudes based on more extensive cognitive elaboration are generally held with greater certainty (Abelson, 1988; Miller, Gross, & Holtz, 1991), it can be concluded that source credibility, by influencing the extent of message elaboration, can systematically impact attitude certainty. More specifically, a message source with low credibility, compared with one with high credibility, should induce greater attitude certainty.

Timing of Source Identification and Need for Cognition as Moderators

The hypothesized source credibility–attitude certainty relationship is likely to emerge only under certain conditions. First of all, if source credibility impacts

attitude certainty through influencing the extent of message elaboration, the timing of source identification should play a critical role in determining the presence or absence of the source credibility–attitude certainty relationship. More specifically, for the hypothesized relationship to emerge, the source has to be identified prior to message exposure so that it can have an effect on message elaboration. If the source is identified after message exposure, message elaboration cannot be influenced by source credibility and thus source credibility should have no impact on attitude certainty.

A second variable that might determine the presence or absence of the source credibility–attitude certainty relationship is an individual's need for cognition (NFC), referring to one's proclivity to engage in and enjoy effortful thinking (Cacioppo & Petty, 1982). Priester and Petty (1995) found that source trustworthiness influenced the extent of message elaboration only for participants who were low in NFC; for those high in NFC, source trustworthiness had no effect on message elaboration. One explanation for the discrepancy is that people who are high in NFC are already motivated to process information. Thus, their extent of message elaboration is less likely to be influenced by source trustworthiness. In contrast, people who are low in NFC are cognitive misers and won't engage in effortful thinking unless they are prompted to do so. An untrustworthy source might act as such a prompt.

In sum, for attitude certainty, a three-way interaction between source credibility, timing of source identification, and individual need for cognition is predicted.

Hypothesis: When the source is identified before message exposure, source credibility will interact with NFC to influence attitude certainty such that lower source credibility will lead to greater attitude certainty when NFC is low, but source credibility will have no effect on attitude certainty when NFC is high; when the source is identified after message exposure, there will be no interaction between source credibility and NFC, and source credibility will have no impact on attitude certainty.

METHOD

The Persuasive Message

The persuasive message used in the experiment was a full-color print advertisement for plant biotechnology. The ad was an adapted version of an actual magazine ad released by the Council for Biotechnology Information (www.whybiotech.com), a North American organization comprised of companies involved in the development of biotechnology-derived crops. The central theme of the ad is that plant biotechnology can help protect the environment by reducing soil erosion and that biotechnology-derived foods are safe to eat (see Appendix for actual wording).

Participants and Procedure

Two hundred twenty undergraduate students (65% = females) recruited from introductory communication classes at a large midwestern university participated

in the experiment in exchange for extra credit. This experiment was conducted in the form of an online survey. An e-mail containing a hyperlink to the homepage designed for the experiment was sent to each participant. After reading the consent form on the homepage, participants entered the online experiment by clicking a “start survey” button. The button was programmed such that the participants would be randomly assigned to source credibility (high or low) and timing of source identification (before or after message exposure) conditions. On the opening screen was a brief introductory message: “As you may know, a lot of foods today are made from biotechnology-derived crops. These foods are often called genetically modified foods.” This message was intended to familiarize participants with the central topic of the ad. Participants were then told that they were about to see a print ad for plant biotechnology from a consumer magazine on the next Web page. They were instructed to view the ad at their own pace. Upon exiting the ad page, participants entered to a new Web page containing a battery of questions. At this point, participants could not return to the previous ad. After completing the questionnaire, participants submitted the answers online and exited the survey.

Independent Variables

Source credibility. Following previous studies (e.g., Priester & Petty, 1995; Brinol, Petty, & Tormala, 2004), this experiment manipulated source credibility by varying the message source’s trustworthiness. In the high credibility condition, participants were told that the print ad was sponsored by a government agency overseeing plant biotechnology. In the low credibility condition, participants were led to believe that the print ad was sponsored by a trade organization comprised of plant biotechnology companies. Because a profit motive is likely to be attached to a trade organization, it was expected that participants would perceive the trade organization to be less trustworthy and thus less credible than the government agency.

Timing of source identification. The source was identified either before or after message exposure. In the before condition, participants were informed of the sponsor of the ad before entering the ad page. In the after condition, participants did not know the sponsor of the ad until after exiting the ad page, but before responding to the questionnaire.

Need for cognition. Need for cognition was measured by a shortened version of an established NFC scale (e.g., “I would prefer complex to simple problems”; Cacioppo, Petty, & Kao, 1984). The 6-item scale appeared to be unidimensional and highly reliable (Cronbach’s $\alpha = 0.83$). A confirmatory factor analysis was also conducted to examine the fit of the one-factor model. The following criteria were used to assess model fit: CFI greater than 0.90 (Bentler, 1990), IFI greater than 0.90 (Hoyle & Panter, 1995), and RMSEA lower than 0.08 (Browne & Cudeck, 1992).

Results of the confirmatory factor analysis indicated a good model fit in terms of CFI and IFI (CFI = 0.97, IFI = 0.97). RMSEA was less than satisfactory but acceptable (RMSEA = 0.08). Given these findings, all six items were averaged to form an index of NFC (after necessary reverse coding), with a higher score indicating higher NFC ($M = 4.37$, $SD = 0.98$). Additional analyses showed that the index of NFC was not affected by the source credibility or timing manipulations.

A high NFC condition and a low NFC condition were formed based on a median split.

Covariates. Because previous research has shown that attitude certainty is influenced by one's knowledge about the attitude object and attitude extremity (i.e., how positive or negative the attitude is), these two variables were included in the analyses as potential covariates. To measure knowledge, participants were asked to indicate how knowledgeable they were about plant biotechnology (item 1) and genetically modified foods (item 2) (Cronbach's $\alpha = 0.94$). The two items were averaged to form an index for knowledge about plant biotechnology.

Another potential covariate was attitude extremity. It is important to note that the attitudes involved here were participants' preexisting attitudes toward plant biotechnology, not their post-exposure attitudes. To minimize the influence of experimental manipulations on attitude extremity measures, past behavioral probes were used as proxies to gauge the extremity of participants' preexisting attitudes.¹ Two dimensions of attitude extremity were considered: the positive dimension (i.e., how positive the attitude is) and the negative dimension (i.e., how negative the attitude is). Participants were asked to indicate their agreement with each of the following statements on a 1 (strongly disagree) to 7 (strongly agree) scale: (1) "In the past when I was shopping for foods, I often chose to buy genetically modified foods"; (2) "In the past when I was shopping for foods, I liked to buy genetically modified foods"; (3) "In the past when I was shopping for foods, I tried to avoid genetically modified foods"; and (4) "In the past when I was shopping for foods, I tried to avoid genetically modified foods even if they were less expensive compared with organic foods." Items 1 and 2 were intended to measure the positive dimension and items 3 and 4 the negative dimension. To explore the underlying dimensionality, the four items were submitted to a principal component analysis with varimax rotation. The results clearly showed a two-factor solution that explained 87% of variance. As expected, the two items measuring the positive dimension loaded on one factor, while the other two loaded on a second factor (all factor loadings > 0.90). Thus, items 1 and 2 were averaged to form an index for the extremity of positive preexisting attitudes toward plant biotechnology (Cronbach's $\alpha = 0.85$) and items 3 and 4 were averaged to form an index for the extremity of negative preexisting attitudes toward plant biotechnology (Cronbach's $\alpha = 0.86$).

Analyses indicated that the three covariates (i.e., knowledge, extremity of positive attitudes, and extremity of negative attitudes) were not influenced by the manipulations of source credibility and timing of source identification or their interaction.

Dependent Measures

Post-exposure attitudes. To measure participants' post-exposure attitudes toward the advocated issue, six questions were asked. The first three questions asked the participants about their attitudes toward plant biotechnology on a 1 to 7 scale: negative/positive, unfavorable/favorable, and dislike/like. The other

¹ The extremity of preexisting attitudes could also be measured prior to message exposure. However, one disadvantage of this is that pre-exposure probes could anchor or prime post-exposure attitude and behavioral intention measures, which makes post-exposure measures less sensitive to experimental manipulations. To maximize the effects of experimental manipulations, the extremity of preexisting attitudes was measured after message exposure, but with relatively objective behavioral probes, which are unlikely to be influenced by experimental manipulations.

three questions asked about their attitudes toward genetically modified foods on a 1 to 7 scale: negative/positive, unfavorable/favorable, and dislike/like. The six items were submitted to a principal component analysis with varimax rotation. The results showed a one-factor solution explaining 83% of the variance (all factor loadings > 0.89). Therefore, the six items were averaged to form an index for post-exposure attitudes toward plant biotechnology (Cronbach's $\alpha = 0.96$).

Attitude certainty. After answering the first three plant biotechnology attitude questions, participants were further asked to indicate their overall certainty about the answers they had given on a 1 (extremely uncertain) to 7 (extremely certain) scale. Similarly, they were asked to indicate their overall certainty about the answers they had given to the three genetically modified foods attitude questions on a 1 (extremely uncertain) to 7 (extremely certain) scale. The two items were averaged to form an index for attitude certainty (Cronbach's $\alpha = 0.85$).

Behavioral intention. Participants were asked to indicate the likelihood that they would buy genetically modified foods in the future on a 1 (extremely unlikely) to 7 (extremely likely) scale.

Manipulation check measures. It is important that source credibility was manipulated as intended. Two items probed participants' perceptions about the sponsor of the ad. The first asked the participants to rate the ad sponsor in terms of trustworthiness on a scale of 1 (not trustworthy at all) to 7 (extremely trustworthy). The second asked them to rate the ad sponsor in terms of the level of expertise on the issue of plant biotechnology on a scale of 1 (a low level of expertise) to 7 (a high level of expertise).

RESULTS

Manipulation Check

To perform a check on the source credibility manipulation, two ANOVAs were conducted, where source credibility and timing of source identification served as the independent variables; the dependent variables were the two manipulation check measures (i.e., the "trustworthiness" item and the "expertise" item). Test results revealed that participants who were assigned to the low source credibility condition perceived the ad sponsor to be less trustworthy than did those who were assigned to the high source credibility condition [$M_{\text{low}} = 4.00$, $M_{\text{high}} = 4.41$, $F(1, 216) = 4.96$, $p < 0.05$], indicating that source credibility was successfully manipulated along the dimension of trustworthiness. On the other hand, participants assigned to the two source credibility conditions perceived the ad sponsor to have an equal level of expertise ($p > 0.80$). Thus, source expertise was held constant across the two conditions.

Hypothesis Testing

It was hypothesized that attitude certainty would be influenced by a three-way interaction among source credibility, timing of source identification, and individual

need for cognition. More specifically, it was proposed that when the source was identified before message exposure, source credibility would interact with NFC to influence attitude certainty such that lower source credibility would lead to greater attitude certainty when NFC was low, but source credibility would have no effect on attitude certainty when NFC was high. In contrast, when the source was identified after message exposure, there would be no interaction between source credibility and NFC, and source credibility would have no impact on attitude certainty.

To test this hypothesis, an ANCOVA was conducted, in which source credibility, timing of source identification, and NFC served as the independent variables. Participants' knowledge about plant biotechnology, extremity of their preexisting positive attitudes, and extremity of their preexisting negative attitudes were included as covariates. The dependent variable was attitude certainty. The results showed that one of the covariates, namely participants' knowledge about plant biotechnology, had a significant impact on attitude certainty [$F(1,209) = 54.78, p < 0.001$] such that more perceived knowledge was associated with greater attitude certainty ($r = 0.46, p < 0.001$). The other two covariates, on the other hand, had no significant effect on attitude certainty.

Of greater interest was the effect of source credibility, timing of source identification, and NFC on attitude certainty. The results revealed a significant two-way interaction between timing of source identification and NFC [$F(1,209) = 13.09, p < 0.001$]. Interestingly, it appeared that for participants high in NFC, identifying the source after message exposure led to greater attitude certainty than identifying it before message exposure ($M_{\text{after}} = 4.56, M_{\text{before}} = 4.07, p < 0.05$). In contrast, for participants low in NFC, the reverse was true ($M_{\text{after}} = 3.99, M_{\text{before}} = 4.56, p < 0.05$). No main effects or other two-way interactions were significant.

Most important, however, was that the previous two-way interaction was qualified by a significant three-way interaction [$F(1,209) = 4.25, p < 0.05$] (see Table 1). To explore the nature of this three-way interaction, the data were divided into two parts based on the timing of source identification: before and after message exposure. An ANCOVA was performed separately for the before and after conditions. The results showed that in the before condition the source credibility–NFC interaction was significant [$F(1,115) = .46, p < 0.05$]. Additional analyses revealed that for participants low in NFC, low source credibility led to greater attitude certainty than did high source credibility ($M_{\text{low}} = 4.98, M_{\text{high}} = 4.41, p < 0.05$). For participants high in NFC, however, source credibility had no impact on attitude certainty. Under the condition in which the source was identified after message exposure, the interaction

Table 1. Adjusted Means and Standard Errors for Each Experimental Cell on the Attitude Certainty Index.

	Source Identified before Message Exposure		Source Identified after Message Exposure	
	High Source Credibility	Low Source Credibility	High Source Credibility	Low Source Credibility
High NFC	4.29 (0.21)	3.93 (0.20)	4.27 (0.22)	4.89 (0.28)
Low NFC	4.41 (0.17)	4.96 (0.22)	3.84 (0.24)	4.04 (0.31)

Note: Displayed are means adjusted for the covariates. Standard errors are in parentheses. The attitude certainty index ranges from 1 (extremely uncertain) to 7 (extremely certain).

between source credibility and NFC was nonsignificant ($p > 0.40$). Neither was there a main effect of source credibility. Collectively, these findings provided support for the main hypothesis.

Additional Analyses

Although not hypothesized, the effects of source credibility, timing of source identification, NFC, and the three covariates on post-exposure attitudes and behavioral intention were also explored. ANCOVAs revealed that extremity of preexisting positive attitudes had a significant impact on both post-exposure attitudes [$F(1,209) = 38.81, p < 0.001$] and behavioral intention [$F(1,209) = 19.56, p < 0.001$]. As expected, more positive preexisting attitudes were associated with more positive post-exposure attitudes ($r = 0.37, p < 0.001$) and greater behavioral intention ($r = 0.32, p < 0.001$). Extremity of preexisting negative attitudes also had a significant impact on both post-exposure attitudes [$F(1,209) = 51.08, p < 0.001$] and behavioral intention [$F(1,209) = 30.73, p < 0.001$]. Specifically, more negative pre-existing attitudes were associated with less positive post-exposure attitudes ($r = -0.38, p < 0.001$) and less behavioral intention ($r = -0.30, p < 0.001$). Further, perceived knowledge had a significant impact on behavioral intention [$F(1,209) = 5.54, p < 0.051$] such that more perceived knowledge led to greater behavioral intention ($r = 0.29, p < 0.001$). The analyses also revealed that the NFC–timing interaction was significant for behavioral intention [$F(1,209) = 4.04, p < 0.05$]. It appeared that when the source was identified after message exposure, participants high in NFC showed greater behavioral intention than those low in NFC ($M_{\text{after}} = 4.69, M_{\text{before}} = 4.18, p < 0.05$). When the source was identified before message exposure, however, NFC had no effect on behavioral intention.

DISCUSSION

Source credibility has arguably been one of the most studied communication variables in the persuasion literature. Previous research has typically focused on the impact of source credibility on attitude favorability, which could fall on a continuum ranging from negative/unfavorable to positive/favorable. Research has also shown, however, that attitudes with the same degree of favorability may differ in their underlying strength. Stronger attitudes are more persistent over time, more resistant to attack, and more predictive of future behaviors. Thus, a persuader's mission is to induce attitudes that are not only favorable but also strong. One indicator of attitude strength is attitude certainty, referring to an individual's subjective confidence in his/her attitude.

A central argument of this research was that low source credibility, compared with high source credibility, would lead to greater attitude certainty. This source credibility–attitude certainty relationship, however, was hypothesized to emerge only when the source was identified before message exposure and for individuals low in need for cognition. This hypothesis was supported by the results of an experiment in which source credibility and timing of source identification were manipulated. More specifically, the experiment found that when the source was identified before message exposure, a significant interaction between source

credibility and need for cognition emerged. The interaction was such that for participants low in need for cognition, source credibility had a negative effect on attitude certainty, but for those high in need for cognition, source credibility had no impact on attitude certainty. On the other hand, when the source was identified after message exposure, there was no interaction effect and neither was there a main effect of source credibility.

Examining the impact of the three covariates (i.e., knowledge, extremity of preexisting positive attitudes, and extremity of preexisting negative attitudes) on attitude certainty provided additional insight into other potential antecedents to attitude certainty. The experiment found that participants' perceived knowledge about the attitude object (i.e., plant biotechnology) was a significant predictor of attitude certainty. More perceived knowledge was associated with greater attitude certainty. This result was consistent with previous findings (e.g., McCroskey, Prichard, & Arnold, 1967–68; Pelham, 1991). On the other hand, extremity of preexisting attitudes, both positive and negative, did not appear to influence attitude certainty, although previous research has generally implied a positive relationship.

On a minor note, the experiment also revealed an interesting, albeit unexpected, interactive effect of need for cognition and timing of source identification on behavioral intention. The nature of the interaction was such that when the source was identified after message exposure, participants high in need for cognition showed greater behavioral intention. When the source was identified before message exposure, however, need for cognition had no effect on behavioral intention. The psychological mechanism underlying this interaction was not readily clear and may warrant future investigation.

In addition to their theoretical contributions, findings of this research also contain important practical implications. Persuasion “industries” (e.g., advertising, health communication, etc.) are often confronted with the decision of choosing an optimal source for their persuasive messages. Intuitively, one might expect that a message source with high credibility would be more effective in inducing persuasion compared to one with low credibility. The current research, along with previous studies (e.g., Hovland & Mandell, 1952), suggests that source credibility may not influence attitude favorability and behavioral intention. However, this research does indicate that source credibility has a significant impact on attitude certainty and attitude–intention consistency, with lower source credibility leading to greater attitude certainty and more attitude–intention consistency. Thus, an advertiser or health practitioner may be advised to use a message source with relatively low credibility, rather than one with high credibility. They are especially advised to do so when the source is identified before message exposure and when the audiences are cognitive misers.

A few limitations of this research need to be taken into account when considering both theoretical and practical implications. One limitation has to do with the manipulation of source credibility in the experiment. As discussed previously, source credibility has two dimensions: trustworthiness and expertise. In the experiment, source credibility was manipulated by varying the perceived trustworthiness of the message source while holding source expertise constant. One may wonder whether similar findings would emerge when source credibility differs only in terms of expertise level. Although logically no differences should be expected, it is still highly desirable for future studies to further investigate the impact of source expertise on attitude certainty and attitude–behavior consistency.

Another limitation is the lack of process measures that would provide evidence for the presumed psychological mechanism underlying the observed effects. It was argued previously that source credibility would exert an impact on attitude certainty by influencing the amount of message elaboration. This argument was based on previous findings showing that (1) source trustworthiness influences the amount of message elaboration (e.g., Priester & Petty, 1995, 2003) and (2) more cognitive elaboration leads to greater attitude certainty (e.g., Abelson, 1988; Miller, Gross, & Holtz, 1991). Although theoretically sound, the assumption could be directly tested by process measures. One of the process measures could be the total number of issue- and/or message-relevant thoughts generated during message processing. A greater number of such thoughts would be indicative of more extensive message elaboration. Alternatively, argument strength in the persuasive message could be manipulated. A greater influence of argument strength on post-exposure attitudes and behavioral intention would signal more extensive message elaboration. Finally, the use of a student sample and the artificiality of the experimental procedure potentially compromised the external validity of the findings.

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APPENDIX

The Actual Wording of the Print Ad

“Would it surprise you to know that growing soybeans can help the Environment? Biotech soybeans have been widely planted by American farmers and they help preserve our natural resources. Plant biotechnology makes it easier to control weeds and plow less—which means less soil erosion. But before those soybean seeds could be planted, it took years of research and testing to ensure that biotech crops were safe for people and the environment. Extensive testing by scientists shows that foods derived from plant biotechnology are as safe to eat as traditional foods.”

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