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The Effects of Source Credibility in the Presence or Absence of Prior Attitudes: Implications for the Design of Persuasive Communication Campaigns[1]

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Abstract

Most theories of persuasion predict that limited ability and motivation to think about communications should increase the impact of source credibility on persuasion. Furthermore, this effect is assumed to occur, regardless of whether or not the recipients have prior attitudes. In this study, the effects of source credibility, ability, and motivation (knowledge, message repetition, relevance) on persuasion were examined meta-analytically across both attitude formation and change conditions. Findings revealed that the Source Credibility × Ability/Motivation interaction emerged only when participants lacked prior attitudes and were unable to form a new attitude based on the message content. In such settings, the effects of source credibility decayed rapidly. The implications of these findings for applied communication campaigns are discussed.

Designing effective communications supposes an understanding of how the intended audience might react to a specific content or type of communicator (e.g., Albarracín et al., 2005; Centers for Disease Control and Prevention, 2001; Durantini, Albarracín, Mitchell, Earl, & Gillette, 2006; National Cancer Institute, 2001; Petty & Cacioppo, 1986). One critical aspect of this understanding is whether and for whom the credibility of a communicator matters. For example, groups with established attitudes about an issue may differ from groups without such attitudes, requiring more or less attention to the communicator selection. The present paper addresses this important yet understudied issue.

Classic theories of attitudes (e.g., social judgment theory, Sherif, Sherif, & Nebergall, 1965; information integration theory, Anderson, 1981), assume that initial attitudes can exert powerful influences when individuals evaluate new information. Despite this widespread assumption, there is partial knowledge on the impact of having versus not having initial attitudes about an object on the processing of later information about that object (for similar observations, see Albarracín, Wallace, & Glasman, 2004; Chaiken, Liberman, & Eagly, 1989; Chaiken, Wood, & Eagly, 1996). Specifically, most of the past research on this topic

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has concentrated on identifying how prior attitudes bias the evaluation of persuasive communications (Chen & Chaiken, 1999; Petty & Cacioppo, 1986; Pratkanis & Greenwald, 1989). However, past research has not clearly established whether people who possess prior attitudes utilize the same types of information as people who lack prior attitudes.

In the present study, we are interested in how the credibility of a source influences attitudes about the topic advocated by that source, and the degree to which these influences may be attenuated by the presence or absence of prior attitudes. Specifically, assessing the credibility of external sources is particularly important in the absence of prior information about the issue. Hence, the credibility of the communicator should be most influential when one is unable to access a prior attitude about the topic and does not construct a personal attitude online based on, for example, the message content (e.g., Chaiken & Maheswaran, 1994; Mackie & Worth, 1989). In contrast, if people have established attitudes about the object, those attitudes are likely to provide readily available, subjectively valid bases for a current evaluation of the object (Albarracín et al., 2004; Eagly & Chaiken, 1993; Fazio, 2000; Kruglanski, Webster, & Klein, 1993; Pratkanis & Greenwald, 1989; Sanbonmatsu & Fazio, 1990). Similarly, repeated exposure to the message or having extensive knowledge about an issue should allow people to form a new attitude on those bases (Wood, Rhodes, & Biek, 1995). Therefore, prior attitudes, prior knowledge, or repeated exposure to the message may reduce the influence of source credibility. One reason is that prior attitudes, knowledge, and message content are generally perceived as being more valid bases for judgment than is the credibility of the source.

In the present study, we test this prediction by meta-analytically integrating the effects of source credibility as a function of whether or not message recipients (a) have initial attitudes about the issues discussed in the communications; and (b) are likely to form online attitudes based on the message content. The likelihood of forming attitudes online is inferred from the presence or absence of message repetition, the availability of prior knowledge on the message topic, and outcome relevance. Importantly, because the effects of source credibility are likely to fluctuate over time, it is imperative to test our predictions not only immediately after the communication, but also later in time. Observing the stability of the effects of source credibility allows us to make some inferences about whether the effects are elaborative (i.e., greater maintenance) or nonelaborative (i.e., greater decay; Petty & Cacioppo, 1986). Therefore, as described presently, the scope of this meta-analysis is restricted to studies that included measurement of attitudes at least twice after message exposure.

Source Credibility in Contemporary Theories of Persuasion

The elaboration likelihood model (ELM) and the heuristic-systematic model (HSM) suggest that message recipients can form or change attitudes on the basis of nonelaborative or elaborative processing of information, depending on their levels of ability and motivation to think about the issue being considered (Chaiken et al., 1989; Chen & Chaiken, 1999; Johnson, Maio, & Smith-McLallen, 2005; Petty & Cacioppo, 1986). Recipients who have the ability and motivation to think about the issue are likely to base their attitudes on the quality of the arguments contained in the communication or on any other information they consider relevant for those attitudes. In contrast, recipients who are unable or unmotivated to think about the issue often base their attitudes on the credibility of the communicator or on the level of consensus in the social environment. Presumably, source credibility and consensus cues are influential in these situations because they are easy to process, even when these cues do not always enjoy subjective validity.

The heuristic-systematic model further suggests that people are inclined to balance efficiency and accuracy in their judgments, exerting as much effort as needed to develop a confident judgment. On the one hand, past attitudes are highly diagnostic criteria for one's current evaluations. Consequently, these past attitudes should provide adequate levels of confidence and relieve individuals from performing further, more effortful analysis of the information. After all, one of the benefits of possessing attitudes is that they provide "ready aids" for evaluating the attitude object the next time one encounters it, without a need to scrutinize it again (Fazio, 2000; Liberman, de la Hoz, & Chaiken, 1988; Pratkanis & Greenwald, 1989; Shavitt, 1989). On the other hand, when individuals lack a prior attitude and must form a new one online, they should be more likely to use their prior knowledge or the information contained in the message if these elements are available, relegating the use of source credibility to the few instances in which neither prior attitudes nor other relevant information are available.

The Present Study

The present study can be placed in the context of an important past controversy. Specifically, there have been arguments that the nonelaborative processes described by Petty and his colleagues (Petty, Wegener, Fabrigar, Priester, & Cacioppo, 1993) should be confined to conditions in which recipients form, rather than change an attitude (Hamilton, Hunter, & Boster, 1993). In response to this contention, however, Petty et al. argued that the impact of source credibility should be independent of the presence or absence of prior attitudes. In support of this argument, Petty et al. cited a study conducted by Mackie and Worth (1989) in which the credibility of the source had a significant effect on attitudes, even among those who held prior attitudes on the issue. This evidence only suggests that the main effect of source credibility may be observed in attitude change conditions as well. However, the critical question is not whether source credibility can have a main effect in such conditions, but whether its impact varies as a function of recipients' ability and motivation to think about the message.

Despite extensive argumentation on the role of prior attitudes in this context, the present study is the first to examine the moderating effect of prior attitudes on the influence of source credibility. We examined whether the impact of source credibility depends on recipients' ability and motivation (i.e., elicited by prior knowledge, message repetition, and outcome relevance) more when individuals lack prior attitudes about the topic than when they have these attitudes. In addition, by synthesizing research in which the effects of source credibility could be established over a period of time, we were able to determine whether the greater effects of source credibility we predicted were relatively short or long lasting.

Based on the premise that heuristic effects tend to be less durable than elaborative types of effects (Chaiken et al., 1989; Petty, Haugtvedt, & Smith, 1995), this examination allows us to ascertain whether the greater influence of source credibility when ability is limited and prior attitudes are absent is a result of nonelaborative processes, such as the use of source information as a heuristic. Specifically, we synthesized the effects not only immediately after the communication, but also an average of about 2 weeks later, when participants returned for a delayed post-test, tested the decay of the effects of source credibility under the conditions that maximize them, and compared the durability of these effects with the durability of change based on message content.

Method

Search Strategies and Sample of Studies

We used multiple procedures to retrieve reports that were available by June 2007. First, we searched databases including PsycINFO (1887–2007), *Social Sciences Citation Index* (SSCI; 1956–2007), *Dissertation Abstracts International* (1861–2007), and Educational Resources Information Center (1967–2007). We used various combinations of the keywords *source credibility*, *expertise*, *trustworthiness*, *attitude formation*, *attitude change*, *attitude persistence*, *attitude and source*, *persuasion and source*, *attitude and memory*, *sleeper effect*, and *persuasion and memory*. We replicated these searches using the terms *opinion* and *belief* in place of the term *attitude*.

Second, after identifying the core body of reports, we examined their references and those of other relevant reviews to retrieve additional reports (e.g., Cook & Flay, 1978; Eagly & Chaiken, 1993; Hovland, Janis, & Kelley, 1953; McGuire, 1968, 1985; Pornpitakpan, 2004; Wilson & Sherrell, 1993). We also searched the SSCI to locate all of the reports that cited the ones that were already in the database.

Third, we manually searched volumes of numerous publications. These include *Journal of Applied Social Psychology* (1985–2007), *Personality and Social Psychology Bulletin* (1974–2007), *Human Communication Research* (1981–2003), *Journal of Personality and Social Psychology* (1965–2007), *Media Psychology* (1999–2007), *Journal of Abnormal and Social Psychology* (1953–1964), *Journal of Consumer Research* (1974–2007), and *Journal of Consumer Psychology* (1992–2007).

Fourth, we requested unpublished reports through electronic mailing lists of the Society for Personality and Social Psychology as well as the Association for Consumer Research (ACR). We also searched the ACR database of Internet-based conference proceedings.

Finally, we searched various other Internet-based databases. These include the Foreign Doctoral Dissertations Database of the Center for Research Libraries (www.crl.edu) and the *ComAbstracts* (www.cios.org) of the Communication Institute for Online Scholarship.

Selection Criteria

We used the following criteria to select the relevant studies. First, we only included studies that involved presentation of a persuasive message containing arguments about a particular topic. Second, we only included longitudinal studies in which the researchers measured attitudes at least twice after message exposure.[3] Third, we included studies only if they involved successful manipulations of source credibility. Thus, studies had to have a condition in which the message was attributed to a credible source and another condition in which the message was attributed to a noncredible source.

Furthermore, available measures of perceived credibility had to reveal the expected effect of manipulated credibility. This criterion led to the exclusion of studies from two reports (i.e., Collamore, 1994; McDermott & Hylton, 1980) in which the manipulation checks showed that participants perceived the source in low-credibility conditions to be as credible as the source in the high-credibility conditions.

[3]Our goal was to include as many longitudinal studies as possible. However, not all longitudinal studies of source credibility were eligible for inclusion. For instance, we excluded a longitudinal study by Dholakia (1987) because it did not include delayed measures of attitudes and that involved requests for behavioral compliance and reminder messages between the message presentation and the delayed measures.

Fourth, we only included studies that provided adequate descriptive and inferential statistics to calculate the relevant effect sizes. This criterion led to the exclusion of studies from two reports (i.e., Chaiken, 1980; Pratkanis, 1981). To deal with the problem of missing information, we obtained and reanalyzed raw data whenever possible by contacting the primary authors or locating the theses and dissertations on which some articles were based. These procedures allowed us to include seven more studies in the database. Finally, we excluded studies involving manipulations of source characteristics solely based on physical attractiveness (e.g., Mills & Aronson, 1965).[4]

Our selection criteria led to a database of 54 data sets (*k*) reported in 18 independent reports. We represented the effects from different experiments as distinct, provided that the samples were statistically independent. The literature synthesized here overlaps significantly with another synthesis focusing on the sleeper effect (Kumkale & Albarracín, 2004). The analyses presented in that synthesis, however, were localized around the delayed effects of communications presented only by noncredible sources. They were not localized on the effects of source credibility, as is the case here. Moreover, the studies reviewed in that synthesis did not always include manipulations of source credibility. Even when they did, several of them only had a low-credibility condition. In short, the present meta-analysis has a broader and different focus.[3]

Coding of Theoretical Moderators

Two coders independently categorized the studies along the identified moderators and obtained satisfactorily high levels of agreement (attitude formation vs. change, $\kappa = .95$; knowledge, $\kappa = .68$; message repetition, $\kappa = 1.00$; outcome relevance, $\kappa = .68$; $p < .001$ for all variables). Disagreements were resolved by discussion and consultation with colleagues.

Attitude formation versus attitude change—To distinguish attitude formation from attitude change, we recorded characteristics of the issues discussed in each study. If the messages used in the studies involved current or controversial issues on which the recipients were likely to possess prior attitudes (e.g., abortion, gun control), we coded such studies as involving attitude change. Studies including messages that attacked cultural truisms (e.g., benefits of tooth brushing or having annual checkups) were also coded as attitude-change studies. In contrast, we classified issues on which the recipients were unlikely to possess initial attitudes at the time of message exposure as pertaining to attitude formation. Among others, these issues might include a commercial for a fictitious product, peace negotiations between two relatively unfamiliar countries, a fictitious political issue in a foreign country, or the political platform of a fictitious organization.

Prior knowledge—In addition, we estimated recipients' prior knowledge about the issues discussed in target messages. In line with previous meta-analytic reviews in the area of attitudes (Eagly, Chen, Chaiken, & Shaw-Barnes, 1999; Glasman & Albarracín, 2006; Johnson & Eagly, 1989; Kumkale & Albarracín, 2004; Wood & Quinn, 2003), we estimated recipients' prior knowledge about the issue (*little or none*, *moderate*, or *high*) from both the characteristics of the issue and researchers' comments in the Method section. After coding the studies along this dimension, however, we observed that there were no attitude-change studies in which participants were likely to have little or no knowledge on the issues discussed in the message. Therefore, we created another indicator with two levels by combining the first two levels of this variable, and used this variable in testing our predictions.

[4]In a study by Maddux and Rogers (1980), physical attractiveness was crossed with the credibility manipulation. For that study, effect sizes were computed by pooling data across the attractiveness conditions.

At first sight, the prior-knowledge variable may seem to be redundant with the variable addressing the presence or absence of prior attitudes. For two reasons, however, this distinction is useful. First, general knowledge about an area (e.g., cell phones) may be high in the absence of prior attitudes about a specific attitude object (e.g., a specific new brand of cell phones). Second, people can hold attitudes toward an object without possessing a wealth of information about it (De Houwer, Thomas, & Baeyens, 2001; Delli-Carpini & Keeter, 1996; Granberg & Holmberg, 1988; Ottati, 2001; Wood et al., 1995; Zajonc, 2001).[5]

Message repetition—To create an indicator of ability or opportunity to think about the communications, we recorded the number of exposures to the target message. In some studies, the target message was repeated at least once; whereas in others, participants received the message only once (for information about the impact of message repetition as a facilitator of issue-relevant thinking, see Cacioppo & Petty, 1985; Sawyer, 1981).

Outcome relevance—We coded the outcome relevance of the messages presented in each study as an indicator of recipients' motivation to think about the message. As in previous meta-analyses (e.g., Eagly et al., 1999; Johnson & Eagly, 1989; Kumkale & Albarracín, 2004; Wood & Quinn, 2003), we coded studies involving messages that were consequential for important immediate goals and interests of the recipients as high in outcome relevance (e.g., tuition increase at the recipients' school). Studies not in this category were coded as low in outcome relevance (e.g., civil rights movements in another country).

Computation of Effect Sizes and Analyses

The effect size index that we used to estimate the impact of source credibility was *g*, which is equal to the mean difference in persuasion between the high-credibility condition and the low-credibility condition, divided by the pooled standard deviation. To estimate the extent to which these effects were maintained over time, we computed effect sizes for this difference at each time of attitude measurement after message exposure (i.e., immediate and delayed post-tests). In addition, we created an index of impact change by subtracting the impact of source credibility at the immediate post-test from the one measured at the delayed post-test.

Because the impact change score is a difference of differences, its variance equals the sum of the variances of the *d*s that enter into the equation (Becker, 1988). The *g* statistic overestimates the population effect size, especially for studies with small sample sizes (Hedges & Olkin, 1985; Johnson & Eagly, 2000). To correct for this bias, we weighted each *g* by the reciprocal of its variance to create *d* before computing weighted average effect sizes (d_+ and Δ_+). Along with weighted average effect sizes, we computed homogeneity statistics (Q) to determine whether the studies shared a common effect size. A significant Q value indicates that the effect sizes comprising the average effect may be coming from different populations. Finally, we tested our predictions by using both fixed-effects and random-effects models (see Hedges & Vevea, 1998).

[5]Studies examining decision making in the context of Presidential elections, for instance, demonstrate that ordinary citizens may hold policy or candidate preferences, even when they do not know the details of the policy or the background of the candidates (e.g., Delli-Carpini & Keeter, 1996; Granberg & Holmberg, 1988). Similarly, research on mere exposure and evaluative conditioning suggests that attitudes can be formed without much thought or knowledge acquisition (for reviews, see De Houwer et al., 2001; Zajonc, 2001). In sum, people may lack attitudes about well-known categories of issues or objects, and also may have attitudes about relatively unfamiliar issues or objects.

Results

Descriptive characteristics of the studies included in the meta-analytic database appear in Table 1. About half of the studies involved formation of attitudes about novel objects or issues (46%), whereas the other half involved attempts to change existing attitudes (54%). In general, messages were presented only once (72%). The content of the messages reveals that 40% of the samples received messages about unknown topics that were not highly relevant to the current goals or interests of the recipients (75%).

Distribution of Effect Sizes and Outliers

Before testing our predictions, we examined the distribution of effect sizes computed for the immediate and delayed impact of source credibility (see Figure 1). The left panel of Figure 1 displays the stem-and-leaf plots of the observed effects, while the right panel displays the normal quantile plots of these effects in standardized form. As can be seen from these plots, the effect sizes computed for the immediate impact of source credibility did not include a distinct outlier. The effect sizes computed for the delayed impact of credibility, however, included an outlier (d = 2.10; Weber, 1971). The analyses reported in the following sections were conducted without this outlier study.

Overall Effect Sizes

As mentioned previously, all of the studies included measures of persuasion administered at the immediate post-test and at the delayed post-test. To examine the magnitude of source-credibility effects in persuasion, we first summarized the differences in persuasion between high-credibility and low-credibility conditions at each time point. Table 2 summarizes the relevant statistics. The first row of Table 2 shows that, on average, messages attributed to highly credible sources led to greater persuasion than did messages attributed to noncredible sources. The second row shows that this difference remained significant at the delayed post-test, despite some decrease in magnitude. The third row verifies this significant decay in impact. For each set of effect sizes, the homogeneity statistics (Q) indicate that effect sizes varied significantly across studies, which justifies attempts to account for this variability in light of our predictions.

Tests of Hypotheses

Most models of persuasion posit that limitations in ability and motivation should increase reliance on cues, such as source credibility (e.g., Petty & Cacioppo, 1986). In contrast, we argue that people who do not have a prior attitude should be most likely to resort to source credibility as a relevant piece of information and to make a judgment on that basis. Those who have a prior attitude, however, may make a judgment on the basis of their existing attitudes, regardless of their situational ability or motivation to think about the communications. We verified this hypothesis using three indicators of ability and motivation to think about the communications (i.e., prior knowledge, message repetition, outcome relevance), as well as the classification of conditions as involving the presence or absence of prior attitudes.

Results of the analyses of the effects of prior knowledge, message repetition, and outcome relevance are presented in Tables 3, 4, and 5, respectively. The results of the random-effects models were almost identical to the results of the fixed-effects models. Therefore, tables present the fixed-effects models. Random-effects statistics are reported in the text.

Effects of Prior Knowledge and the Presence or Absence of Prior Attitudes

Table 3 presents the results of the analyses pertaining to the effects of the presence or absence of prior attitudes and the levels of prior knowledge in a particular sample. As

expected, prior knowledge influenced the effect of source credibility when people were forming an attitude. The main effect of prior knowledge was significant in both fixed-effects and random-effects models: fixed-effects, $Q_B(1) = 4.65$, $p < .05$; random-effects, $t(22) = 2.15$, $p < .05$.

The first column of Table 3 shows that the effect of source credibility was maximal when recipients possessed neither initial attitudes nor a deep body of knowledge on the issues discussed in the target message (fixed-effects, $d_+ = 0.75$; random-effects, $d_+ = 0.75$). The impact of source credibility in this condition was significantly greater than the impact of source credibility in all other conditions ($p < .05$ for all contrasts). Thus, this finding supports the dual-process prediction that the influence of source credibility should be more pronounced when people have limited ability to think about the communications. However, as expected, when people had a prior attitude about the topic, the main effect of prior knowledge on the issue was nonsignificant (see the right panel of Table 3): fixed-effects, $Q_B(1) = 1.32$, $p > .20$; random-effects, $t(27) = 0.89$; $p > .30$.

Effects of Message Repetition and the Presence or Absence of Prior Attitudes

Table 4 summarizes the effects of message repetition, which were less definitive as a result of the absence of conditions with message repetition and prior attitudes, but closely resembled the findings for prior knowledge. The first row of Table 4 shows that the effect of source credibility was maximal when people had no prior attitudes about the topic and the message was presented only once (fixed-effects, $d_+ = 0.78$; random-effects, $d_+ = 0.78$). As indicated previously, the effect was smaller when participants had a prior attitude (fixed-effects, $d_+ = 0.27$; random-effects, $d_+ = 0.31$), even when the message was not repeated. Thus, when people had limited opportunity to process the incoming message (i.e., no repetition), the effects of source credibility on persuasion depended on the presence or absence of a prior attitude: fixed-effects, $Q_B(1) = 22.40$, $p < .0001$; random-effects, $t(37) = 3.58$, $p < .002$. In conclusion, the analyses reported in Tables 3 and 4 show that limited ability to think about the communications increased reliance on source credibility when people were unlikely to possess prior attitudes, but not when they were likely to possess such attitudes.

Effects of Outcome Relevance and the Presence or Absence of Prior Attitudes

Next, we conducted the same analyses using outcome relevance as an indicator of motivation to think about the communications. Table 5 summarizes the results relevant to the interaction between source credibility and outcome relevance across both attitude formation and change conditions. Although the effect sizes were not evenly distributed because of few cases in the attitude-formation/high-relevance condition, the critical attitude-change conditions had studies with both high and low relevance. As the right panel of Table 5 shows, outcome relevance did not interact with source credibility in these conditions. Thus, these data provide converging evidence that decreases in ability or motivation have little effect in attitude-change conditions.

Stability of Effects Over Time

It was important to determine whether the effects of source credibility were a result of elaborative or nonelaborative processing. Because it is often assumed that changes resulting from nonelaborative processing are shorter lived than are changes resulting from elaborative processing (for a review, see Petty et al., 1995; for a discussion of other factors, see Albarracín & McNatt, 2005; Albarracín et al., 2004), we compared the decay of the effects of source credibility with the decay of messages whose sources were not described (i.e., message-only control condition).

The last columns of Tables 3, 4, and 5 display effect sizes representing the change of the immediate effects of source credibility over time. Table 3 shows that the sharpest decline in the impact of source credibility was observed when participants lacked prior attitudes as well as prior knowledge of the issue ($d_+ = 0.39$; $p < .05$ in all cases, for contrasts with other effects). Likewise, Table 4 shows that the sharpest decline in the impact of source credibility was observed when participants lacked prior attitudes and the message was presented only once ($d_+ = 0.51$; $p < .05$ in all cases, for contrasts with other effects). Presumably, participants in these two conditions were able to form a current attitude using source credibility as a heuristic and thus compensate for the lack of prior attitudes, prior knowledge, or sufficiently repeated information. These effects, however, decayed quickly, suggesting that the underlying process was relatively nonelaborative (heuristic). The outcome relevance data provided converging evidence. There was a sharp decline in the impact of source credibility for those who formed an attitude about a low-relevant issue ($d_+ = -0.34$; $p < .05$ in all cases, for contrasts with other effects).

In most persuasion settings, the impact of communications depends on the message content as well as the source credibility. Thus, although greater decay is often taken as an indication of the extent to which the initial change was a result of nonelaborative processing (Petty et al., 1995), it is necessary to interpret the aforementioned results in relation to the amount of decay observed for the influence of the message content. Thus, we performed comparative analyses using the message-only control conditions that were available in about one fourth of the studies ($k = 16$), which presented no source information whatsoever.

Our analyses reveal that the amount of change in persuasion from the immediate to the delayed post-test in these message-only conditions was small ($d_+ = -0.07$; CI = −0.17 to 0.03); homogeneous ($Q = 17.65$, $p > .20$); independent of prior attitudes, prior knowledge, or message repetition (fixed-effects $Q_B = 0.31$, 2.35, and 0.30, respectively, *ns*); and significantly smaller than the decay of the source credibility influence in the absence of prior attitudes, knowledge, repetition, and outcome relevance (*p*s < .05). In this light, we conclude that d_+ values of −0.34, −0.39, and –0.51, respectively, can be reasonably interpreted as the result of the use of source credibility as a heuristic.[6]

Discussion

The study of attitudes and persuasion concerns the processes involved in the formation and change of people's attitudes. Surprisingly, however, relatively little research has addressed the impact of possessing prior attitudes on the processing of persuasive communications (for similar observations, see Albarracín, 2002; Albarracín et al., 2004; Chaiken et al., 1996; Eagly & Chaiken, 1993). In the present study, we focused on this distinction and examined the effects and moderators of source credibility in attitude formation and attitude change.

We tested the hypothesis that the impact of source credibility on persuasion would be greatest when people form new attitudes (i.e., do not have prior attitudes) and lack the ability or motivation to form an attitude on the basis of more relevant information, such as prior knowledge or the message content. In contrast, we expected a weaker influence of source credibility when participants had a prior attitude or the ability/motivation to form an attitude based on prior knowledge, or on the message content. To test this idea, we examined the influence of source credibility on persuasion as a function of the presence or absence of prior attitudes in combination with recipients' prior knowledge about the issue, the number

[6]Analyzing the effects of argument strength would be highly useful in shedding light on this issue. Unfortunately, argument strength was rarely manipulated; therefore, it can be assumed to be strong. Moreover, there were not enough details to code for arguments, and access to the materials was prevented by the age of the literature.

of exposures to the message, and the outcome relevance of the issue. As expected, recipients relied on the credibility of the source to a greater extent when they possessed neither prior attitudes nor prior knowledge about the issue, or when the message content was presented only once. Consequently, an important contribution of our study is to identify the different outcomes that are likely to take place when people have prior attitudes about an issue and when they do not. As discussed in the following sections, this finding has implications for practitioners interested in designing interventions and communication campaigns.

Presence of Heuristic Effects in the Absence of Prior Attitudes

Our findings also suggest that differences between attitude formation and change reflect differences in the availability of a subjectively valid criterion for judgment. That is, reliance on source credibility is most marked when people not only lack a prior attitude, but also the opportunity to form a new one based on prior knowledge of an issue. Moreover, these differences disappear when the presence of prior knowledge or message repetition allows participants to form an attitude from scratch. Despite these differences, source credibility affects persuasion in both attitude formation and change conditions because recipients do not completely ignore the credibility of the source when they have a prior attitude or knowledge of the object.

Consequently, the applicability of peripheral processes to attitude change appears to be a matter of degree, which is contrary to the claims of some researchers who have argued that peripheral processes, as described by the ELM, are confined to attitude formation (Hamilton et al., 1993).

Consistency of Our Reasoning With Contemporary Theorizing

The HSM assumes that people engage in as much cognitive processing as is necessary to achieve a desired level of confidence. They can often attain that level of confidence by simply activating and applying a relevant heuristic that leads them to use external information as a basis for judgment (e.g., “Expert sources can be trusted”). However, people who have prior attitudes—or who can form an attitude on the basis of seemingly relevant information—may attempt to use these attitudes as soon as they identify the topic of the message. Thus, although source credibility may still influence recipients with prior attitudes, this influence is partially overridden by the prior attitude.

Of course, greater reliance on prior attitudes should only be the case to the extent that prior attitudes are perceived to be more valid or diagnostic than the credibility of the communication source. Consequently, situations could arise in which the credibility of the source would be perceived as more valid and the effects we encountered in the meta-analysis would not occur. For example, the level of confidence in one’s prior attitudes may be a critical moderator of these effects. Recipients who distrust their existing attitudes and wish to increase their confidence in them may give greater weight to the incoming information, instead of relying on their existing attitudes (Chaiken et al., 1989).

Similarly, the current goals of the recipients may qualify our findings in important ways. For example, people who want to be accepted by the group to which a communication source belongs may find the opinion of the source to be highly relevant to their current goals. Consequently, they may rely on the source’s recommendations, even when they have prior attitudes and knowledge that contradict those recommendations. Both of these effects, however, imply relatively elaborative influences of source credibility, which were not addressed in our review.

Implications for Other Peripheral Effects

Research inspired by dual-process persuasion models has shown that the peripheral effects of source credibility increase as recipients' ability and motivation to think about the communications decrease (for reviews, see Chen & Chaiken, 1999; Petty & Wegener, 1999). In addition, other factors (e.g., message length, number of arguments, social consensus) exert similar effects when people are unable or unmotivated to think about the message. Specifically, longer messages, messages with more arguments, and stronger social consensus are more persuasive than are shorter messages, messages with fewer arguments, and weaker social consensus.

In the context of our study, it appears that the same dynamic observed for the effect of source credibility should be apparent for message length, argument number, and social consensus. People who must form an attitude for the first time may use these cues in making their judgments, provided that no other information of greater diagnosticity is available at the time. Future research should clarify these potential effects and obtain further confirmation that, as hypothesized by Petty and Cacioppo (1986), these types of nonelaborative effects are relatively short lasting, as our meta-analysis revealed.

The Present Research and Maintenance of Attitude Change

The present study complements our earlier meta-analysis on the sleeper effect (Kumkale & Albarracín, 2004). In that meta-analysis, we focused on the longitudinal course of change that took place in only one condition; that is, the condition in which an otherwise persuasive message was associated with a discounting cue, such as a noncredible source or a disclaimer note reducing the validity of the message. In this study, however, we examined the magnitude and persistence of the effect of source credibility on persuasion, as indicated by the difference in persuasion between high- and low-credibility conditions at the time of the immediate and delayed post-tests. Thus, we were interested in the between-group differences at each time of measurement.

Consequently, these two reviews differ in their conceptual implications. For instance, the major contribution of the present study is to enhance our understanding of the identification, selection, and integration of information from multiple potential bases of attitudes (e.g., source credibility, prior attitudes). This review also shed light on how these processes lead to attitudes with different rates of decay. In contrast, the analysis of the sleeper effect focused on representations of the arguments and the discounting cue in memory, as well as the effects of these representations on attitudes as time elapses. In sum, these two meta-analytic reviews generated two different sets of findings from the available literature on source credibility, and should have an additive contribution to our current knowledge of attitude formation and change.

Identification, Selection, and Integration of Attitude-Relevant Information

When people form attitudes on the basis of a persuasive message, the message content and the source of the message—as well as recipients' past experiences, moods, and expectations—can all influence attitudes. Therefore, explicating the mechanisms by which people identify, select, and integrate information from multiple sources appears to be essential in understanding attitude formation and change (Albarracín, 2002; Albarracín & Kumkale, 2003; Albarracín et al., 2004). Perhaps surprisingly, however, past research has been relatively silent about these processes.

The present study contributes to our understanding of information identification and selection by specifying the conditions under which source credibility, prior attitudes, prior knowledge, and message content are likely to be selected and used in judgment. Prior to

these analyses, the ELM and the HSM suggested that recipients who have the ability and motivation to think about the communications base their attitudes on the message content, whereas recipients who have limited ability or motivation to think about the arguments are more influenced by the use of source credibility as a cue to persuasion (Petty & Cacioppo, 1986). For example, these models predict that the heuristic effects of source credibility may be most apparent when people lack prior knowledge about the issues being considered and when the reception of the message content is insufficient. Our findings, however, show that this hydraulic relationship prevails when people form attitudes for the first time. People who possess other, more diagnostic information (e.g., prior attitude, persuasive argument) show limited reliance on source credibility, regardless of their prior knowledge or the number of times a message is repeated.

Importantly, the processing of a persuasive communication occurs in a series of stages, including interpretation of information, retrieval of information from memory, and selection and use of available information as a basis for judgment (Albarracín, 2002). People must first direct their attention to potential information and then assess the extent to which this information is relevant to the judgment they are about to make (Albarracín & Kumkale, 2003; Feldman & Lynch, 1988). Although the findings from this meta-analysis are correlational, their generalizability lends credibility to the conclusion that individuals identify and select information on which to base their attitudes on the most relevant elements. Quite often, these attitudes are based on prior knowledge or on the message content. When these sources of information are limited, however, an expert other is able to elicit the formation of a new opinion.

Applied Implications

The present meta-analysis shows that associating a message with a credible source is most useful in attitude formation conditions, especially when recipients are not highly able and motivated to think about the message.

Thus, using a credible communicator should be especially effective when introducing a new idea or product and when addressing an audience with low processing ability and motivation. Sometimes, however, recipients may be able and motivated to think about the message, but the message itself may contain minimal, if any, evidence or argumentation (e.g., public-service announcements tailored for children and uneducated adults). Using a credible source may be useful in these kinds of contexts as well (Durantini et al., 2006).

When we move from attitude formation to attitude change, however, the benefit of using a credible source decreases considerably. First, when people have a prior attitude, the level of ability or motivation to think about the message does not moderate the effect of source credibility. Second, the average impact of source credibility in attitude-change conditions is lower than in attitude-formation conditions. Thus, this resistance or insensitivity to the source's influence suggests that other strategies may be needed to persuade an audience with prior attitudes toward an issue.

The variability in the effects of source credibility highlights the importance of tailoring communications around recipient characteristics (e.g., ability, motivation, prior attitudes). This finding confirms those of another meta-analysis calling for greater emphasis on tailoring. Specifically, Durantini et al. (2006) examined the effectiveness of different types of sources (i.e., influence agents, such as experts or lay community members) for increasing condom use, and found that neither source expertise nor demographic similarity between the communicator and the recipient had a uniform effect across different subgroups of the population. As in the present meta-analysis, using an expert source was generally an advisable strategy. However, the effects of source expertise varied across different segments

of the society. Some groups (e.g., women, ethnic minorities) were much more influenced by experts than by laypersons, whereas others (e.g., teenagers) were equally influenced by experts and by laypersons.

We believe that the approach–avoidance model of persuasion (Knowles & Linn, 2004) provides some insights about how persuasion can be increased by decreasing resistance. According to this model, there are two ways of persuading an audience: increasing the approach or persuasion forces (i.e., alpha strategies), and reducing the avoidance or resistance forces (i.e., omega strategies). On the one hand, popular alpha strategies include increasing source credibility, using strong arguments, adding incentives, and providing consensus information. On the other hand, omega strategies include redefining the persuasive interaction as not involving influence, but consultancy or conversation; affirming the values of the audience to instill confidence and self-esteem; distracting the audience from counterarguing the message; providing prior resistance opportunities; and framing messages in such a way that resistance to the message means change in the desired direction (i.e., using reverse psychology). As omega strategies are aimed at decreasing resistance, many of them can be used along with alpha strategies in increasing the effectiveness of communicators in attitude-change conditions.

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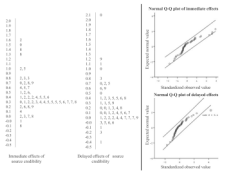

Figure 1.
The left panel presents the stem-and-leaf plots of effect sizes computed for the immediate and delayed effects of source credibility. The right panel displays the normal quantile plots of these effects in standardized form. Effect sizes falling outside of the 95% normality-confidence interval can be treated as outliers.

Table 1

Studies in Meta-Analytic Database

Study	Experiment or dataset	Immediate impact *d* (95% CI)	Delayed impact *d* (95% CI)	Change (A) in impact over time (95% CI)	Sample sizes (HI, LI) (H2, L2)	Attitude formation or change	Message repetition	Prior knowledge	Outcome relevance	Time interval (days)
Falk (1970)		0.32 (−0.10 to 0.74	−0.23 (−0.64to0.19)	−0.55 (−0.85 to −0.25)	(44, 44) (44, 44)	Change	No	High	Low	28
Gillig & Greenwald (1974)	Experiments 1−3: defense arguments presented	0.37 (−0.05 to 0.80	0.31 (−0.12 to 0.74)	−0.06 (−0.36 to 0.24)	(45,41) (45,41)	Change	No	Low or moderate	Low	12
	Experiments 1–3: defense arguments not presented	1.02 (0.59 to 1.46	0.45 (0.03 to 0.86)	−0.58 (−0.88 to −0.28)	(48, 45) (48, 45)	Change	No	Low or moderate	Low	12
Hennigan et al. (1982)	Receiver set. 2-week delay	0.34 (−0.19 to 0.88	0.34 (−0.19 to0.88)	0.00 (−0.38 to 0.38)	(27, 27) (27, 27)	Formation	Yes	High	Low	14
	Transmitter set. 2-week delay	0.28 (−0.26 to 0.82	0.02 (−0.52 to 0.57)	−0.26 (−0.64 to 0.12)	(28, 26) (26, 26)	Formation	Yes	High	Low	14
	Receiver set. 5-week delay	0.42 (−0.11 to 0.96	0.66 (0.09 to 1.23)	0.24 (−0.15 to 0.63)	(27, 28) (25, 25)	Formation	Yes	High	Low	35
	Transmitter set. 5-week delay	0.46 (−0.07 to 0.99	−0.05 (−0.58 to 0.49)	−0.51 (−0.89 to −0.13)	(28, 28) (27, 26)	Formation	Yes	High	Low	35
	Receiver set 9-week delay	0.56 (0.02 to 1.10	0.48 (−0.08 to 1.04)	−0.08 (−0.46 to 0.31)	(27, 28) (24, 27)	Formation	Yes	High	Low	63
	Transmitter set. 9-week delay	0.34 (−0.19 to 0.88	−0.41 (−0.97 to0.15)	−0.75 (−1.14 to −0.37)	(27, 28) (26, 24)	Formation	Yes	High	Low	63
Hovland & Weiss (1951)	Issue: Future of movie theatres	0.03 (−0.47 to 0.54	−0.03 (−0.53 to 0.48)	−0.06 (−0.42 to 0.29)	(31,30) (31,30)	Change	No	Low or moderate	Low	28
	Issue: Use of antihistamines	0.38 (−0.13 to 0.88	0.09 (−0.41 to 0.59)	−0.29 (−0.64 to 0.07)	(31,30) (31,30)	Change	No	Low or moderate	Low	28
	Issue: Atomic submarines	0.83 (0.29 to 1.36	0.17 −0.34 to 0.69)	−0.65 (−1.02 to −0.28)	(25, 36) (25, 36)	Change	No	Low or moderate	Low	28
	Issue: Current steel shortage	0.45 (−0.07 to 0.96	0.10 (−0.40 to 0.61)	−0.34 (−0.70 to 0.02)	(35, 26) (35, 26)	Change	No	Low or moderate	Low	28
Johnson et al. (1968)	Issue: Problems with frequent tooth brushing	0.72 (0.26 to 1.18	0.72 (0.25 to 1.18)	0.00 (−0.33 to 0.32)	(39, 39) (37, 37)	Change	No	Low or moderate	High	7
	Issue: Problems with use of X-rays	0.78 (0.31 to 1.24	0.69 (0.23 to 1.15)	−0.09 (−0.42 to 0.24)	(36, 36) (40, 40)	Formation	No	Low or moderate	Low	7
Johnson & Watkins (1971)	Message was not repeated	1.62 (0.89 to 2.36)	0.39 (−0.25 to 1.03)	1.23 (−1.71 to −0.75)	(19, 19) (19, 19)	Formation	No	Low or moderate	Low	28

Study	Experiment or dataset	Immediate impact *d* (95% CI)	Delayed impact *d* (95% CI)	Change (A) in impact over time (95% CI)	Sample sizes (HI, LI) (H2, L2)	Attitude formation or change	Message repetition	Prior knowledge	Outcome relevance	Time interval (days)
	Message was repeated 5 times	1.38 (0.67 to 2.09)	1.29 (0.59 to 1.99)	−0.09 (−0.58 to 0.41)	(19, 19) (19, 19)	Formation	Yes	Low or moderate	Low	28
Jones et al. (2004)		−0.05 (−0.29 to 0.19)	0.05 (−0.19 to 0.29)	0.10 (−0.06 to 0.26)	(136, 134) (136, 134)	Change	No	High	Low	14
Kelman (1958)		0.42 (0.01 to 0.83)	0.20 (−0.21 to 0.60)	−0.22 (−0.51 to 0.07)	(51,51) (43, 43)	Change	No	High	High	11
Kelman & Hovland (1953)	Source reinstated	0.35 (−0.05 to 0.78)	0.75 (0.32 to 1.18)	0.40 (0.09 to 0.71)	(52, 38) (52, 38)	Change	No	High	High	21
	Source not reinstated	0.35 (−0.08 to 0.75)	0.02 (−0.39 to 0.42)	−0.35 (−0.63 to −0.07)	(45, 51) (45, 51)	Change	No	High	High	21
Kumkale (2004)	Source comes after message	0.82 (0.18 to 1.47)	0.70 (0.06 to 1.33)	−0.13 (−0.58 to 0.33)	(20, 20) (20, 20)	Formation	Yes	High	High	0
	Source comes before message	0.64 (0.00 to 1.27)	0.83 (0.19 to 1.48)	0.19 (−0.26 to 0.65)	(20, 20) (20, 20)	Formation	Yes	High	High	0
Maddux & Rogers (1980)	Arguments conditions	0.35 (−0.30 to 1.00)	0.45 (−0.20 to 1.11)	0.10 (−0.36 to 0.56)	(16, 22) (16, 22)	Change	No	High	High	14
McCroskey (1966)	Experiment 1: Federal control of education with evidence	−0.18 (−0.45 to 0.09)	−0.06 (−0.33 to 0.21)	0.12 (−0.07 to 0.31)	(107, 107) (107, 107)	Change	No	High	High	49
	Experiment 1: Capital punishment with evidence	0.30 (0.03 to 0.57)	0.12 (−0.14 to 0.39)	−0.18 (−0.37 to 0.01)	(107, 107) (107, 107)	Change	No	High	Low	49
	Experiment 1: Federal control of education without evidence	0.35 (0.08 to 0.62)	0.24 (−0.03 to 0.51)	−0.11 (−0.30 to 0.08)	(107, 107) (107, 107)	Change	No	High	High	49
	Experiment 1: Capital punishment without evidence	0.32 (0.05 to 0.59)	0.46 (0.19 to 0.73)	0.14 (−0.05 to 0.33)	(107, 107) (107, 107)	Change	No	High	Low	49
	Experiment 2: Federal control of education with evidence	0.31 (0.00 to 0.62)	0.01 (−0.30 to 0.32)	−0.30 (−0.52 to −0.08)	(80, 80) (80, 80)	Change	No	High	High	28
	Experiment 2: Capital punishment without evidence	0.26 (−0.05 to 0.57)	0.07 (−0.24 to 0.38)	−0.19 (−0.41 to 0.03)	(80, 80) (80, 80)	Change	No	High	Low	28
	Experiment 2: Capital punishment with evidence	0.41 (0.10 to 0.73)	0.10 (−0.21 to 0.41)	−0.31 (−0.53 to −0.09)	(80, 80) (80, 80)	Change	No	High	Low	28

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Study	Experiment or dataset	Immediate impact *d* (95% CI)	Delayed impact *d* (95% CI)	Change (A) in impact over time (95% CI)	Sample sizes (HI, LI) (H2, L2)	Attitude formation or change	Message repetition	Prior knowledge	Outcome relevance	Time interval (days)
	Experiment 2: Federal control of education without evidence	0.45 (0.13 to 0.76)	0.41 (0.10 to 0.72)	−0.04 (−0.26 to 0.18)	(80, 80) (80, 80)	Change	No	High	High	28
Olson & Cal (1984)		1.50 (0.84 to 2.16)	1.00 (0.40 to 1.61)	−0.50 (−0.94 to −0.06)	(22, 25) (22, 25)	Change	No	Low or moderate	High	21
Pratkanis et al. (1988)	Experiment 1	0.33 (−0.48 to 1.13)	0.21 (−0.59 to 1.02)	−0.11 (−0.68 to 0.46)	(12, 12) (12, 12)	Formation	No	Low or moderate	Low	0
	Experiment 2	0.44 (−0.37 to 1.25)	0.20 (−0.60 to 1.00)	−0.24 (−0.81 to 0.33)	(12, 12) (12, 12)	Formation	No	Low or moderate	Low	0
	Experiment 3	0.37 (−0.44 to 1.18)	0.23 (−0.57 to 1.04)	−0.13 (−0.70 to 0.44)	(12, 12) (12, 12)	Formation	No	Low or moderate	Low	0
	Experiment 4	0.52 (−0.30 to 1.33)	0.28 (−0.52 to 1.09)	−0.23 (−0.81 to 0.34)	(12, 12) (12, 12)	Formation	No	Low or moderate	Low	0
	Experiment 7: Source comes 1 unit before message	1.05 (0.45 to 1.66)	0.31 (−0.26 to 0.88)	−0.74 (−1.15 to −0.33)	(24, 24) (24, 24)	Formation	No	Low or moderate	Low	0
	Experiment 7: Source comes 2 units before message	0.70 (0.11 to 1.28)	0.43 (−0.15 to 1.00)	−0.27 (−0.68 to 0.14)	(24, 24) (24, 24)	Formation	No	Low or moderate	Low	0
	Experiment 7: Source comes 2 units after message	0.79 (0.20 to 1.37)	0.11 (−0.45 to 0.68)	−0.67 (−1.08 to −0.27)	(24, 24) (24, 24)	Formation	No	Low or moderate	Low	0
	Experiments 10−11: Source comes after message	0.14 (−0.17 to 0.45)	0.15 (−0.16 to 0.46)	0.01 (−0.21 to 0.23)	(80, 80) (80, 80)	Change	No	Low or moderate	Low	0
	Experiments 10−11: Source comes before message	0.08 (−0.23 to 0.39)	0.04 (−0.27 to 0.35)	−0.05 (−0.27 to 0.17)	(80, 80) (80, 80)	Change	No	Low or moderate	No basis for judgment	0
	Experiment 13	0.22 (−0.41 to 0.84)	−0.11 (−0.73 to 0.51)	−0.32 (−0.76 to 0.12)	(20, 20) (20, 20)	Change	No	Low or moderate	Low	0
	Experiment 14	0.02 (−0.34 to 0.37)	0.04 (−0.42 to 0.40)	0.03 (−0.23 to0.28)	(60, 60) (60, 60)	Change	No	Low or moderate	Low	0
	Experiment 15	0.07 (−0.53 to 0.66)	0.07 (−0.52 to 0.66)	0.00 (−0.41 to 0.42)	(22, 22) (22, 22)	Change	No	Low or moderate	Low	0
	Experiment 16	−0.01 (−0.45 to 0.43)	0.07 (−0.36 to 0.51)	0.09 (−0.22 to 0.40)	(40, 40) (40, 40)	Change	No	Low or moderate	Low	0
Schulman & Worrall (1970)		0.83 (0.32 to 1.34)	0.02 −0.32 to 0.36)	−0.81 (−1.09 to −0.53)	(27, 69) (39, 65)	Formation	No	Low or moderate	Low	7

Study	Experiment or dataset	Immediate impact *d* (95% CI)	Delayed impact *d* (95% CI)	Change (Δ) in impact over time (95% CI)	Sample sizes (H1, L1) (H2, L2)	Attitude formation or change	Message repetition	Prior knowledge	Outcome relevance	Time interval (days)
Watts & McGuire (1964)		0.29 (−0.03 to 0.62)	0.16 (−0.19 to 0.52)	−0.13 (−0.37 to 0.11)	(85, 66) (85, 48)	Change	No	Low or moderate	Low	7
Weber (1971)	Source comes before message	0.36 (−0.61 to 1.33)	0.50 (−0.48 to 1.49)	0.14 (−0.54 to 0.84)	(7, 10) (7, 10)	Formation	Yes	Low or moderate	Low	14
	Source comes after message	1.48 (0.51 to 2.46)	2.10 (1.03 to 3.17)	0.62 (−0.10 to 1.34)	(9, 12) (9, 12)	Formation	Yes	Low or moderate	Low	14
Weber (1972)	Source repeated 22 times, 3-week interval	0.67 (−0.01 to 1.36)	0.42 (−0.25 to 1.09)	−0.25 (−0.73 to 0.23)	(17, 18) (17, 18)	Formation	Yes	Low or moderate	Low	21
	Source repeated 22 times, 7-week interval	0.51 (−0.14 to 1.16)	1.11 (0.42 to 1.79)	0.60 (0.13 to 1.07)	(18, 20) (18, 20)	Formation	Yes	Low or moderate	Low	49
	Source repeated 2 times, 3-week interval	0.42 (−0.21 to 1.05)	−0.06 (−0.68 to 0.56)	−0.48 (−0.92 to −0.04)	(19,21) (19,21)	Formation	Yes	Low or moderate	Low	21
	Source repeated 2 times, 7-week interval	0.65 (−0.07 to 1.37)	0.14 (−0.56 to 0.84)	−0.51 (−1.01 to −0.01)	(18, 14) (18, 14)	Formation	Yes	Low or moderate	Low	49

Note. Positive effect sizes for immediate and delayed effects of source credibility indicate that messages attributed to credible sources induced greater persuasion than did messages attributed to noncredible sources. The effect sizes in Column 5 (Δ) represent the extent to which the immediate effect of source credibility changed over time: Negative effect sizes in this column indicate that the impact of source credibility decayed over time. In the sample size column (Column 6), H1 and L1 values refer to the number of participants in the high- and low-credibility conditions who completed the immediate measures of attitudes; similarly, H2 and C2 values refer to the number of participants who completed the delayed measures of attitudes. Most studies involved within-subjects designs; therefore, the number of participants who completed the delayed measures of attitudes was generally equal to the number of participants who completed the immediate measures of attitudes. This was not the case in some studies, however, as they involved between-subjects designs in which the immediate and delayed measures of attitudes were completed by different groups of people (e.g., Schulman & Worrall, 1970). 95% CI = confidence interval around *d* or Δ. Time interval = amount of days between the immediate and delayed measurement of persuasion.

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Table 2

Overall Magnitude and Persistence of Source Credibility Effects

	Fixed effects			Random effects		
Follow-up	**d_+ or Δ_+**	**95% CI**	***Q***	**d_+ or Δ_+**	**95% CI**	***τ***
Immediate impact (d_+)	0.35	0.29 to 0.41	107.60***	0.42	0.34 to 0.51	0.05***
Delayed impact (d_+)	0.21	0.15 to 0.27	82.08***	0.23	0.18 to 0.28	0.03***
Impact change (Δ_+)	−0.15	−0.19 to −0.11	161.87***	0.20	−0.28 to −0.12	0.06***

Note. $N = 4502$. $\kappa = 53$ studies. d_+ and Δ_+ = weighted average effect size; CI = confidence interval around d_+ or Δ_+; τ = estimated between-studies variance of effect parameters. In the first two rows of the table, positive effect sizes indicate that messages attributed to highly credible sources induced greater persuasion than did messages attributed to less credible sources. Effect sizes in the last row represent the extent to which the immediate effect of source credibility changed over time; these effect sizes were computed by subtracting the magnitude of source credibility effects at the immediate post-test from the delayed post-test (Δ). These effect sizes are all negative because the impact of source credibility decayed over time, in general. Model-fit statistic *Q* is an index of homogeneity of effect sizes included in d_+ or Δ_+. Significant *Q* values indicate violations of the homogeneity assumption.

*** $p < .01$.

Table 3

Effects of Source Credibility as a Function of Attitude Formation Versus Change and Prior Knowledge

Variable	Attitude formatior			Attitude change		
	Immediate impact (d_+)	**Delayed impact (d_+)**	**Impact change (Δ_+)**	**Immediate impact (d_+)**	**Delayed impact (d_+)**	**Impact change (Δ_+)**
Prior knowledge						
Low or moderate knowledge	0.75	0.35	−0.39	0.33	0.19	−0.14
	(0.58 to 0.91)	(0.19 to 0.50)	(−0.50 to −0.28)	(0.22 to 0.44)	(0.08 to 0.30)	(−0.22 to −0.06)
	Q_w = 14.73, *ns*	Q_w = 20.73, *ns*	Q_w= 51.92***	Q_w = 40.88***	Q_w = 17.57, *ns*	Q_w = 28.93*
		k=16			*k*=15	
High knowledge	0.46	0.29	−0.18	0.24	0.16	−0.08
	(0.27 to 0.66)	(0.09 to 0.49)	(−0.32 to −0.04)	(0.16 to 0.33)	(0.08 to 0.25)	(−0.14 to −0.02)
	Q_w = 2.45, *ns*	Q_w= 14.76*	Q_w= 19.72**	Q_w = 19.63, *ns*	Q_w = 23.07*	Q_w = 47.68** *
		k=8			*k*=14	
Between-group differences (Q_B)	4.65*	0.19, *ns*	5.39*	1.32, *ns*	0.18, *ns*	1.40, *ns*

Note. The immediate impact of source credibility corresponds to the difference between the persuasion means of high- and low-credibility sources at the immediate post-test. The delayed impact is the same difference score measured at the delayed post-test. Positive effect sizes indicate that highly credible sources induced greater persuasion than did less credible sources. The effect sizes for impact change were computed by subtracting the immediate impact of source credibility from the delayed impact. These effect sizes are all negative because the impact of source credibility decayed over time, in general. The Q_W statistic is an index of homogeneity of effect sizes within a given cell. Significant Q_W values indicate violations of the homogeneity assumption. The between-classes effect (Q_B) is a sum of squares analogous to a main effect in a fixed-effects ANOVA test (Hedges & Olkin, 1985). Significant Q_B values indicate that the effect of knowledge within a given column is significant. *k*= number of studies; d_+ and Δ_+ = weighted average effect size; CI = confidence interval around d_+ or Δ_+.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

Effects of Source Credibility as a Function of Attitude Formation Versus Change and Message Repetition

	Attitude formation			Attitude change		
Variable	**Immediate impact (d_+)**	**Delayed impact (d_+)**	**Impact change (Δ_+)**	**Immediate impact (d_+)**	**Delayed impact (d_+)**	**Impact change (Δ_+)**
Message repetition						
No repetition	0.78	0.27	−0.51	0.27	0.17	−0.11
	(0.58 to 0.98)	(0.09 to 0.45)	(−0.64 to −0.37)	(0.21 to 0.34)	(0.10 to 0.24)	(−0.16 to −0.06)
	Q_w = 9.26, ns	Q_w = 6.08, ns	Q_w = 27.59**	Q_w = 61.90***	Q_w = 41.72*	Q_w = 77.43***
		k=10			*k*= 29	
Message repeated	0.53	0.37	−0.16	—	—	—
	(0.37 to 0.69)	(0.21 to 0.54)	(−0.28 to −0.04)			
	Q_w = 12.55, ns	Q_w = 28.88**	Q_w = 34.66***	—	—	—
		k=14				
Between-group differences (Q_B)	3.61†	0.73, *ns*	16.78***	—	—	—

Note. The immediate and delayed impact of source credibility was calculated by subtracting mean persuasion for low-credibility sources from mean persuasion for high-credibility sources. Positive effect sizes indicate that highly credible sources induced greater persuasion than did less credible sources. The effect sizes in the impact change columns were computed by subtracting the immediate impact of source credibility from the delayed impact. These effect sizes are all negative because the impact of source credibility decayed over time, in general. The Q_W statistic is an index of homogeneity of effect sizes within a given cell. Significant Q_W values indicate violations of the homogeneity assumption. The between-classes effect (Q_B) is a sum of squares analogous to a main effect in a fixed-effects ANOVA test (Hedges & Olkin, 1985). *k*= number of studies; d_+ and Δ_+ = weighted average effect size; CI = confidence interval around d_+ or Δ_+.

† $p < .06$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 5

Effects of Source Credibility as a Function of Attitude Formation Versus Change and Outcome Relevance

	Attitude formation			Attitude change		
Variable	**Immediate impact (d_+)**	**Delayed impact (d_+)**	**Impact change (Δ_+)**	**Immediate impact (d_+)**	**Delayed impact (d_+)**	**Impact change (Δ_+)**
Outcome relevance						
Low	0.62	0.29	−0.34	0.31	0.15	−0.16
	(0.49 to 0.75)	(0.17 to 0.42)	(−0.43 to −0.24)	(0.21 to 0.40)	(0.06 to 0.24)	(−0.22 to −0.09)
	Q_w = 21.48, *ns*	Q_w= 31.74, *ns*	Q_w = 71.30***	Q_w = 22.67, *ns*	Q_w= 12.74, *ns*	Q_w = 42.11***
		k = 22			*k*=18	
High	0.73	0.76	0.03	0.33	0.26	−0.08
	(0.28 to 1.18)	(0.31 to 1.22)	(−0.29 to −0.36)	(0.21 to 0.44)	(0.14 to 0.37)	(−0.16 to 0.00)
	Q_w= 0.16, *ns*	Q_w = 0.09, *ns*	Q_w = 0.98, *ns*	Q_w = 29.48***	Q_w = 24.94**	Q_w = 26.27**
		k = 2			*k*=10	
Between-group Differences (Q_B)	0.19, *ns*	3.86*	4.75*	0.08, *ns*	2.03, *ns*	2.39, *ns*

Note. The immediate and delayed impact of source credibility was calculated by subtracting mean persuasion for low-credibility sources from mean persuasion for high-credibility sources. Positive effect sizes indicate greater persuasion for credible sources. The effect sizes in the impact change column were computed by subtracting the immediate impact of source credibility from the delayed impact. Negative effect sizes in this column indicate decay in impact over time. Significant Q_W values indicate violations of the homogeneity assumption. The between-classes effect (Q_B) is a sum of squares analogous to a main effect in a fixed-effects ANOVA test (Hedges & Olkin, 1985). *k*= number of studies; d_+ and Δ_+ = weighted average effect size; CI = confidence interval around d_+ or Δ_+.

* $p < .05$.

** $p < .01$.

*** $p < .001$.