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"I Thought about It and I May Follow What You Said": Three Studies Examining the Effects of Elaboration and Source Credibility on Risk Behavior Intentions

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ABSTRACT

The induction of cognitive elaboration on information concerning risks may facilitate compliance with messages encouraging audiences to mitigate against risks. Nevertheless, cognitive elaboration and its relationship with other key variables in risk information processing have been largely understudied. Revisiting data from three experiments, this study examined how cognitive elaboration influences behavioral intentions associated with a risk, and the relationship between cognitive elaboration and behavioral intentions, as mediated by perceptions of source credibility. Results consistently found that cognitive elaboration directly predicted increases in both source credibility perceptions and behavioral intentions, along with an indirect effect of cognitive elaboration on behavioral intentions through credibility. Together, the comparative analyses suggest that cognitive elaboration may be a robust factor to aid risk information processing and can be examined in different risk contexts. Practical and theoretical implications, future directions, and limitations are discussed.

KEYWORDS: cognitive elaboration, source credibility, risk perceptions, behavioral intention, confirmatory factor analyses

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Cognitive elaboration is the active process of linking recently acquired information with other information stored within an individual's memory, such as that acquired through personal experiences, or the process of creating new connections between pieces of information (DeFleur & Ball-Rokeach, 1989; Eveland, 2001). With respect to its application in mediated contexts, one of the central premises of cognitive elaboration is that active processing (whether by choice or induction) is related to mediated persuasion processes. Cognitive elaboration may have critical applications for risk communication. Risk is an interactive process and expands in intensity and complexity over time (Sellnow et al., 2008). Although a given risk might not bring visible damages to safety, health, financial, or public interest in the current state, it is often composed of uncertainties and conflicting perspectives regarding future events and consequences. Risk communication, therefore, often involves expressions of concerns, arguments, message placement, consideration of audience characteristics or personal reactions to risk management in the long-term (Lachlan, Spence, Lin et al., 2014; Lin, Lachlan, & Spence, 2016; Sellnow et al., 2008; Spence et al., 2010; Spence et al., 2019). The complexity surrounding a risk issue often fosters intense debates, primarily occurring among experts with diverse perspectives, which can lead to heightened risk uncertainty, increase confusion in issue interpretation, and undermine the credibility of official spokespersons (Kasperson et al., 2000; Ulmer et al., 2017). Thus, it is vital for individuals to deliberately sort through the available risk information in such contentious cases, which requires cognitive elaboration to govern the eventual response to a hazard. The effective induction of elaboration on risks to health, life, and property may facilitate compliance with messages encouraging audiences to prepare against such risks. To date, however, this concept and its relationship with risk processing have been largely understudied. This study examines the function of cognitive elaboration across a range of risk contexts.

Research examining the effectiveness of diverse online media affordances in risk communication and persuasions appears inconsistent. For instance, some studies have found retweeting risk messages enhanced trustworthiness perceptions, whereas

others indicated that retweets of warning messages reduced source credibility judgments (e.g., Lin et al., 2016; Lin et al., 2018; Lin & Spence, 2019). Such mixed findings call for further identification of the influence of mediators in risk information processing. One of the factors evident from the literature is cognitive elaboration (e.g., Westerman et al., 2014).

A small number of studies have examined related constructs in risk contexts. For example, a study by Homer and Kahle (1990) examined the effect of source expertise, time of identification of the source, and involvement (a concept like cognitive elaboration) on persuasion, and found a three-way interaction among attitudes toward the message, attitudes toward the product, and behavioral intention. They argue that, under high-issue involvement conditions, a high-credibility source was perceived as superior to a low-credibility source. Other literature looking at involvement found that those who engage in higher levels of information processing increased the probability of learning from the media (Fleming et al., 2006). Involvement "has been linked to media use motives that are grounded in the importance of the content and reflect a desire to acquire and share information" (Rubin & Perse, 1987, p. 63). Although not exactly the same construct, the relationship between involvement and elaboration suggests the possibility of elaboration as a vital issue in the potential processing of risk information.

Studies motivated by dual-process models have examined similar concepts in health and risk literature. For example, Emmers-Sommer and Terán (2020) examined source credibility, elaboration, and intentions related to celebrity sources and participant sex. Their results indicated that participants found celebrities more credible than medical experts; the data further indicated that elaboration and intention to change behavior varied across participant sex. Similarly, Jones et al. (2003) looked at exercise intentions and randomly assigned participants to receive information from a credible or a noncredible source (media doctor or high school science student). Drawing from Elaboration Likelihood and Prospect Theory, findings suggested that when a credible source alongside a positive frame was presented, elaboration and intentions to exercise were the strongest. Moreover, Trumbo and McComas (2003)

proposed a path model of risk regressed on information processing and source credibility perception. This work showed that, when perceiving high credibility for authoritative and professional sources or low credibility for citizen groups, participants tended to follow heuristic processing and perceived lower levels of risk.

These studies highlighted the roles of elaboration, credibility, and intentions to change behaviors and used dual-process models to explain credibility and behavioral intentions. Nevertheless, the willingness of individuals to establish perceptions of source credibility as a function of their elaboration on received messages is a different question. The idea of cognitive elaboration, as conceptualized by Perse (1990), focuses on involvement with the message and highlights that information processing is active and is not bound by characteristics of the message or source itself influencing credibility perceptions. To date, the use of this conceptualization in the study of social media messages is limited. Westerman et al. (2014) used similar logic to the above studies to examine elaboration and the recency of posts to a social media account in promoting information on heart disease risk. Their results suggest that credibility was not directly impacted by recency of updates but rather that cognitive elaboration mediated the relationship between recency and perceptions of credibility. These results were replicated and extended by Lachlan, Spence, Edwards et al. (2014) and Spence et al. (2016) in examinations of tweets by the Centers for Disease Control and Prevention which centered on the risk associated with flu seasons. Results supported that cognitive elaboration mediated the relationship between update speed on Twitter and the desire to seek additional information on a topic. Finally, Spence et al. (2020) examined the role of cognitive elaboration concerning self-disclosure and intentions to take prescribed behaviors. In this study, participants listened to a radio segment on the risk associated with tornado season and viewed the Facebook page of the radio personality. Their thorough analysis was post hoc but provided further evidence to support that cognitive elaboration may be an important and understudied area in risk communication. Their results found that cognitive elaboration mediated the relationship between self-disclosure and perceptions of source credibility in addition to behavioral intentions and desire

to seek additional information on the risk. Therefore, the current research contributes to examining how robust the mediating effect of cognitive elaboration is in predicting information processing outcomes in diverse risk contexts.

Furthermore, source credibility is a critical consideration in the effectiveness of crisis and risk messaging. Because risk messaging often stems from centralized sources, there is typically a power dynamic between messenger and receiver, such that receivers may be resistant to behavioral advice from government and public health officials. Establishing credibility is paramount in motivating audiences to listen, internalize information, and comply with recommendations (Lin & Spence, 2018; Renn & Levine, 1991). Perceived credibility will likely reinforce the legitimacy of the information, while suspicion concerning credibility (especially from abstract organizations) may hinder risk communication efforts and exacerbate negative consequences (Glik, 2007). Thus, if elaboration plays a role in the connection between credibility perceptions and compliance, risk communicators should aim to induce both.

The results of the reviewed findings, taken together, highlight that the act of thinking about risk may have specific positive implications for risk response, and that cognitive elaboration may be a critical component in processing credibility in risk messages and subsequent intentions to change behavior. Given those findings and the incomplete treatment of elaboration in the existing risk and crisis literature, the following research questions are offered:

> **RQ1:** To what extent does cognitive elaboration influence behavioral intentions associated with a risk?
>
> **RQ2:** To what extent is this relationship between cognitive elaboration and behavioral intentions mediated by perceptions of source credibility?

Procedures

Data from prior studies, both published and unpublished, were re-analyzed to examine the relationship between cognitive elaboration, credibility, and behavioral intentions (Lin, Spence, &

Lachlan, 2016; Lin & Spence, 2018). Although these studies contained experimental designs, the manipulations themselves are not germane to the current analysis; instead, the current findings examine the proposed relationships across all conditions in each study. Participants were independent across all three studies. All three studies contained identical measures of elaboration, competence, trust, and goodwill. Cognitive elaboration was measured with five questions from Perse (1990) on a five-point scale with anchors of "strongly agree" and "strongly disagree." Participants were asked to respond to the given statements indicating their agreement concerning their actions in relation to the Twitter page viewed: "When I looked at the page, I thought about it over and over" and "When I looked at the page, I thought about what should be done." Competence, trust, and goodwill comprise the source credibility measure that included 18 items with a 7-point semantic differential item response option format (McCroskey & Teven, 1999). Example response options include "honest/dishonest" and "informed/uninformed." Although associated with two different outcomes, the questions regarding behavioral intentions were measured using similar five-item scales and operationalized behavioral intentions in the same way (seeking additional information regarding the risk). Because of the increased attention to elaboration and the potential utility of the findings, the existing data was revisited. A description of the data collection procedures follows.

Study 1

The first study is unpublished and consisted of an experimental design with two conditions concerning a risk-related tweet.[1] There were 111 valid responses from respondents recruited from undergraduate courses at a Southern research university (see Table 1 for participant demographics). A food safety rumor embedding health threats affecting broad audiences was used for the stimuli. Specifically, participants read a tweet concerning the alert of contaminated watermelons in grocery stores. After viewing the tweet, participants responded to a measure of cognitive elaboration

1. Study One originally examined two conditions with retweets present and absent.

TABLE 1 Study One: Reported Demographic Characteristics of Participants

		N (%)	*M*	*SD*
Sex				
	Male	51 (45.9)		
	Female	60 (54.1)		
Age (18–26)		62	18.61	1.23
Race				
	Caucasian	94 (84.7)		
	African-American	8 (7.2)		
	Asian	6 (5.4)		
	Latino	1 (.9)		
	Others	2 (1.8)		
Income				
	Under $20,000	9 (8.1)		
	$20,000–$30,000	2 (1.8)		
	$30,001–$50,000	15 (13.5)		
	$50,001–$70,000	22 (19.8)		
	$70,001–$100,000	20 (18.0)		
	Over $100,000	41 (36.9)		
N		111		

(Perse, 1990), source credibility (McCroskey & Teven, 1999), and a five-item scale concerning behavioral intentions with seven response options containing anchors of "not at all likely" to "very likely." For example: "How likely are you to talk with a doctor or other health professional about toxic watermelons?"

Previously published studies have indicated strong reliability for McCroskey and Teven's (1999) source credibility scale; however, researchers have cautioned against making assumptions that the high validations of these scales hold across all subsequent

uses. Levine et al. (2006) argue in favor of reporting confirmatory factor analyses (CFA) on previously validated scales, particularly when subtle changes in wording is present. A CFA was conducted on the collected data using a maximum likelihood (MLM) solution in AMOS to confirm the scale's three-factor structure. After removing one item from the goodwill scale (i.e., "self-centered; not self-centered"), the data was consistent with the three-factor solution and yielded good model fit indices: $\chi 2(116) = 229.43$, CMIN/df = 1.98, TLI = .90, CFI = .92, RMSEA = .09 (Levine et al., 2006). Reliabilities after CFA were $\alpha = .92$ for competence, $\alpha = .89$ for trust, and $\alpha = .87$ for goodwill.

Study 2

A total of 696 valid responses were obtained from participants recruited from undergraduate courses at a Southern research university (see Table 2 for participant demographics). The stimuli considered a relevant health risk topic for broad audiences including the participants.[2] Participants viewed a tweet concerning the risk of drug-resistant gonorrhea. They were then taken to a posttest survey about source credibility (McCroskey & Teven, 1999), cognitive elaboration (Perse, 1990), and a five-item scale concerning behavioral intentions with seven response options containing anchors of "not at all likely" to "very likely." Example items include "How likely are you to talk with a doctor or other health professional about drug-resistant gonorrhea?" and "How likely are you to take steps to reduce your risk of contracting drug-resistant gonorrhea?" The data was consistent with the three-factor solution and yielded good model fit indices: $\chi 2(117) = 405.63$, CMIN/df = 3.46, TLI = .96, CFI = .96, RMSEA = .06 (Levine et al., 2006). Scale reliability for credibility was .95; reliability was detected at .93 for competence, .87 for goodwill, and .92 for trustworthiness.

Study 3

The third study consisted of an experimental design with nine conditions concerning a risk-related tweet.[3] A total of 434 valid

2. See Lin, Lachlan, and Spence, 2016 for the detailed experimental design.
3. Study Three originally examined nine conditions with Twitter user identity and levels of retweets. See Lin and Spence, 2018.

TABLE 2 Study Two: Reported Demographic Characteristics of Participants

		N (%)	*M*	*SD*
Sex				
	Male	307 (44.1)		
	Female	365 (52.4)		
Age (18–79)		366	20.89	6.43
Race				
	Caucasian	497 (73.7)		
	African-American	53 (7.9)		
	Asian	64 (9.5)		
	Latino	34 (5.0)		
	Others	26 (3.9)		
Income				
	Under $20,000	85 (12.9)		
	$20,000–$30,000	43 (6.5)		
	$30,001–$50,000	75 (11.4)		
	$50,001–$70,000	98 (14.9)		
	$70,001–$100,000	104 (15.8)		
	Over $100,000	254 (38.5)		
N		696		

responses from respondents were recruited from undergraduate courses at a Southern research university (see Table 3 for participant demographics). Specifically, participants read a tweet about the alert of contaminated watermelons in grocery stores (similar to Study One) and were then provided a questionnaire. Participants responded to the same measure of cognitive elaboration (Perse, 1990) and source credibility (McCroskey & Teven, 1999), and a five-item scale concerning behavioral intentions with seven response options containing anchors of "not at all likely" to "very likely." Example items include "How likely are you to look for more information about toxic watermelons?" Again, a CFA was performed on the source credibility measures. After removing one item from the goodwill scale (i.e., "not understanding-understanding"), the data was consistent with the three-factor

TABLE 3 Study Three: Reported Demographic Characteristics of Participants.

		N (%)	*M*	*SD*
Sex				
	Male	199 (45.9)		
	Female	232 (53.5)		
Age (18–55)		330	20.34	5.96
Race				
	Caucasian	343 (79.0)		
	African-American	31 (7.1)		
	Asian	32 (7.4)		
	Latino	13 (3.0)		
	Others	13 (3.0)		
Income				
	Under $20,000	44 (10.1)		
	$20,000–$30,000	26 (6.0)		
	$30,001–$50,000	31 (7.1)		
	$50,001–$70,000	63 (14.5)		
	$70,001–$100,000	80 (18.4)		
	Over $100,000	186 (42.9)		
N		434		

solution and yielded good model fit indices: $\chi 2(111) = 223.81$, CMIN/df = 2.11, TLI = .98, CFI = .98, RMSEA = .05. High reliabilities were detected for the individual scales, with $\alpha = .94$ for competence, $\alpha = .93$ for trust, and $\alpha = .87$ for goodwill.

Results

Across all three datasets, the proposed model was tested using path analysis in AMOS. For Study One, diagnostic statistics supported the proposed model, CMIN = 1.23, CFI = .99, RMSEA = .05. Elaboration was found to significantly predict competence ($\beta = .33$, $p < .001$), trustworthiness ($\beta = .34$, $p < .001$), goodwill ($\beta = .15$, $p < .01$), and behavioral intentions ($\beta = .20$, $p < .001$).

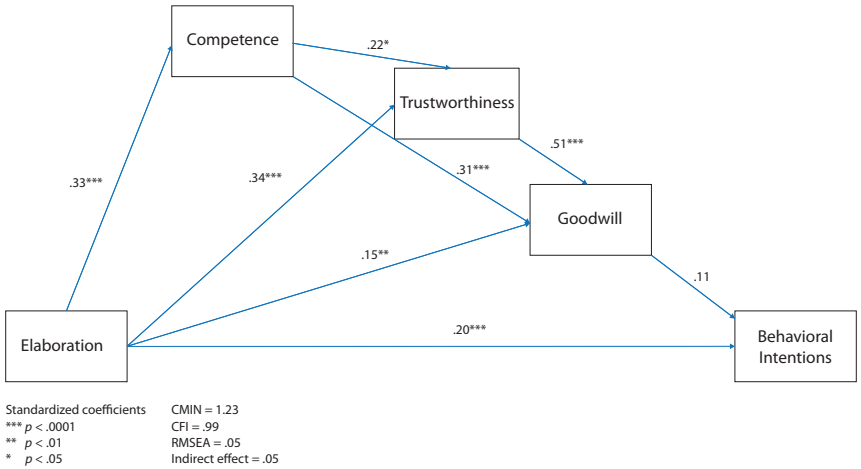

FIGURE 1 **Path Model for Study One**

There is a substantive indirect effect of elaboration on behavioral intentions at β = .05 (see Figure 1). Notably, direct effects were not detected for goodwill on behavioral intentions.

This same analytic approach was taken when re-examining the data from Study Two. Once again, support was found for the proposed model, CMIN = 2.65, CFI = .99, RMSEA = .05. Elaboration was found to significantly predict competence (β = .27, p < .001) and goodwill (β = .13, p <.01) but not trustworthiness; a significant direct effect was found for elaboration on behavioral intentions (β = .42, p < .001). An indirect effect of elaboration on behavioral intentions was also detected at β = .02 (see Figure 2).

Finally, analyses for the data from Study Three once again indicated evidence of strong model fit, CMIN = 0.24, CFI = .99, RMSEA = .01 (see Figure 3). Once again, elaboration significantly predicted competence (β = .10, p <.05), trustworthiness (β = .03, p <.01), and goodwill (β = .17, p <.001); and a significant direct effect was detected for elaboration on behavioral intentions (β = .33, p <.001). Once again, a small but relevant indirect effect was detected for elaboration on behavioral intentions at β = .02. As in Study One, direct effects were not detected between source credibility and behavioral intentions.

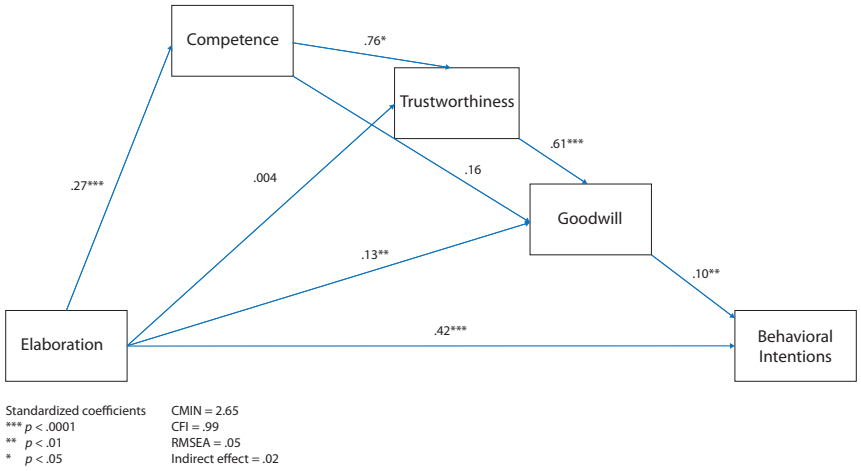

FIGURE 2 **Path Model for Study Two**

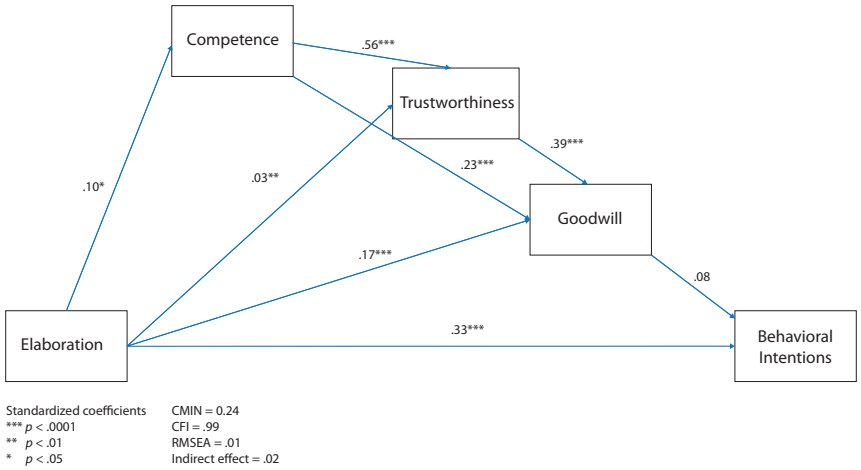

FIGURE 3 **Path Model for Study Three**

Discussion

Reanalyzing data from the prior three experiments, the current report attempts to identify the role of cognitive elaboration in risk information processing on social media. Although the risk contexts differed, CFAs indicated good to excellent measurement model fit in all three studies. The findings from the three CFAs were consistent, suggesting that cognitive elaboration may be a robust measure that can be examined in different risk contexts. In

short, the degree to which one elaborates on risk is relevant and can likely be assessed in multiple contexts.

In terms of the structural models, the results clearly and consistently indicated that cognitive elaboration directly predicted the increases in both source credibility perceptions and behavioral intentions. Thinking through risk information is predictive of source credibility and, perhaps more importantly, predictive of behavioral intentions related to risk avoidance. These findings are consistent with earlier work suggesting that elaboration may mediate the relationships between self-disclosure, source credibility, information seeking, and behavioral intentions (Savage & Spence, 2014; Spence et al., 2020). They are also consistent with several theoretical arguments, including the Elaboration Likelihood Model (Petty & Cacioppo, 1986) and the Heuristic Systematic Model (Chaiken et al., 1989), which stress the importance of active information processing in effective persuasion.

Across all three studies, elaboration directly and positively impacted behavioral intentions, and indirectly impacted them through perceptions of source credibility. This suggests a challenge for risk communication practitioners—it may be necessary to induce some degree of elaboration in order to maximize the effectiveness of risk messages (provided those messages are compelling and come from believable sources). Active processing of these arguments may heighten behavioral intentions both directly and indirectly. However, such active processing may have to be promoted for novel, underestimated risks, or about which the audience believes they know all they need to know. This is consistent with research in the dual modeling literature suggesting that people process information economically, using only what they believe necessary to reach a decision (Bohner et al., 1995; Chaiken, 1987; Thompson et al., 1994). Relatedly, it is also consistent with the notion of *sufficiency thresholds* in the Risk Information Seeking and Processing Model literature (see Griffin et al., 1999; Yang et al., 2011), which suggests that information seeking will be driven by a perceived need to acquire additional information until an individual believes they can make an informed decision. Given the consistent representation of this variable in the mainstream persuasion literature, as well as that explicitly related to environmental and

health risks, the current findings and those outlined in the literature review suggest the need for further consideration of elaboration in risk perception and motivation to respond, particularly its inclusion in structural models aimed at testing multipart theories. It may be the case that elaboration on risk messaging is not only directly driving compliance but also impacting other intervening variables (in this case, source credibility). These are, of course, empirical questions that require direct examination.

The current research examined elaboration with relationship to the conceptualization and operationalization of Perse (1990). However, regardless of the specifics concerning conceptualization, research on elaboration may focus on understanding if it is a trait of individual viewers, a product of the message, or a combination of these and other factors. This would help better answer questions about the persuasiveness of central and peripheral routes in persuasion. Although these questions are outside the scope of this report, the consistent findings here help move research in the direction of answering these and similar questions.

Notably, the results also indicated that the path coefficients for elaboration on behavioral intentions are stronger than the path coefficients for source credibility across all three models. It is noted that only Study Two indicated a significant direct effect for source credibility on behavioral intentions. While limited to these datasets, the current findings offer preliminary evidence that elaboration may be a stronger predictor of behavioral intentions than credibility perceptions. Therefore, the depth of elaboration on a risk issue would directly persuade an individual's intentions for further information seeking and risk preventions, regardless of their position on the source credibility. The findings might also explain the online communication dynamics and the spread of rumors or false information, especially when the original information sources were absent. The more people actively engage in elaboration on risk messages, the more likely they would act upon them.

The models across the three studies all indicated elaboration had small indirect effects through source credibility on behavioral intentions. Although a growing number of studies in risk and

crisis communication also have placed emphasis on source credibility, the findings are mixed in terms of the relationship between credibility perceptions and online information acceptance. The gap between those hypotheses and results may be best explained in terms of cognitive elaboration. It is also noted that in Study Two, the path coefficient for elaboration on intentions was stronger than the results in Study One and Three. In Study Two, while source credibility weakly but significantly predicted behavioral intentions, the indirect effects for the overall model suggest that source credibility perceptions would facilitate elaborations in risk persuasion. There may be a threshold at which elaboration triggers certain levels of credibility perception and, in turn, source credibility is strong enough to evoke the subsequent risk behavioral intention persuasions. Although not testable with the current data, it may also be the case that elaboration is contingent upon perceived information sufficiency: When individuals believe that they shall require more information about a salient matter, they may be more active in pursuing and processing it. Once again, such a process would be consistent with HSM and arguments in the RISP literature on risk message processing (see Griffin et al., 1999; Yang et al., 2011).

This investigation demonstrates that it is fruitful to reexamine the prior data with comparative analyses on elaboration and risk information processing. For decades, persuasion theorists have tried to identify the components of solid arguments across a variety of contexts. Similarly, in promoting elaboration, the question can be asked, "What makes people think through information?" Moreover, with the plethora and ease of accessible information, people might believe they have accessed sufficient information to aid their decision-making. Because of this, it may be even more vital to motivate the public to think about risks. The literature outlined in this report provides a starting point for the consideration of these processes, such as involvement or media use motives. Regardless, this research highlights direct benefits to information seeking, perceptions of source credibility, and intentions to change behavior. Thus, elaboration is an important additional consideration for the study of risk messages.

Limitations and Future Directions

Given the data availability, the current research only considered three main factors: elaboration, source credibility, and behavioral intentions. Nevertheless, previous persuasion theories and practical operations suggest that other factors, such as personal attention and motivation, information literacy, and efficacy perceptions, might intervene in risk information persuasion. Thus, future research could consider examining the functions of those variables in the model. Taking those variables in the model in the future could fulfill the overall cognitive roadmap of risk persuasions providing a more comprehensive understanding of elaboration mediating the subsequent information processing and risk responses.

The findings also indicated that elaboration did not significantly predict trustworthiness in Study Two. It is possible that trustworthiness was not triggered in this risk topic as the risk contexts were identical in Study One and Three. Although the sample collections were independent across three studies, participants were convenient samples recruited from student volunteers. Thus, future research should apply more diverse risk and health topics to examine the risk persuasion effect and include more diverse participants for research generalizability.

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