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Source Credibility, Expertise, and Trust in Health and Risk Messaging

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Summary and Keywords

Our understanding and perceptions of source credibility significantly drive how we process health and risk messages, and may also influence relevant behaviors. Source credibility is believed to be impacted by both perceptions of source trustworthiness and expertise, and the effect of credibility on changes in attitudes and behavior has been studied for decades in the persuasion literature. However, how we understand and define source credibility—particularly the dimension of expertise—has changed dramatically as social media and other online platforms are increasingly used to design and disseminate health messages. While earlier definitions of source credibility relied heavily on the source's credentials as indicators of expertise on a given topic, more recent conceptualizations must also account for expertise held by laypeople who have experience with a health concern. This shifting conceptualization of source credibility may then impact both why and when people select, as well as how they perceive, process, and judge, health messaging across both novel and more traditional communication contexts.

Keywords: credibility, expertise, trustworthiness, trust, health, media, Internet, risk, source, message, health and risk message design and processing

Perceptions of source credibility are key to the degree of message acceptance. Source credibility has long been thought to comprise perceptions of a source's trustworthiness and expertise, and those perceptions of source credibility significantly drive how people process health and risk messages. Indeed, cues about a source's experience and honesty may be even more important when assessing the believability of health information than other kinds of information, as believing inaccurate information about our health could have dire personal consequences. However, how we understand and define source credibility—particularly the dimension of expertise—has changed dramatically as social media and other online platforms are increasingly used to design and disseminate health messages. While earlier definitions of source credibility focused on the source's credentials as indicators of expertise on a given topic, more recent conceptualizations must also account for expertise held by laypeople who have experience with a health concern.

This shifting conceptualization of source credibility may impact both why and when people select, as well as how they perceive, process, and judge, health messaging. To ground this conceptualization in the heritage of study in credibility, trust, and expertise, source credibility research in the persuasion and related literatures will be reviewed. Research and models that are specific to health and those that provide more general knowledge of source credibility but can be applied to health messaging will be considered. More contemporary approaches to the understanding and application of source credibility, including directions for future research, will also be examined.

A Review of Source Credibility Research

The credibility or believability of a source influences perceptions of information from that source, and vice versa. In one of the foundational works that has framed most studies of credibility, source credibility is posited to consist of perceptions of source trustworthiness and expertise (Hovland, Janis, & Kelley, 1953). Expertise is defined as “the extent to which a communicator is perceived to be a source of valid assertions,” whereas trustworthiness is “the degree of confidence in the communicator’s intent to communicate the assertions he considers most valid” (Hovland et al., 1953, p. 21). Other scholars have defined credibility with similar constructs under different names; for example, McCroskey and Young (1981) use the terms “competence” and “character,” which essentially correspond with expertise and trustworthiness.

These two dimensions of source credibility assessment are perceptual in nature, suggesting that while source credibility may be linked to the accuracy of the message, accuracy and credibility are overlapping yet distinct constructs. Other scholars have similarly differentiated between the accuracy of information and its perceived credibility, specifying that credibility is perceptual rather than a direct measure of information accuracy (Fogg & Tseng, 1999; Freeman & Spyridakis, 2004; Metzger & Flanagin, 2015). While accuracy and credibility are clearly both significant factors in health and risk messaging, it is important to remember that research on credibility focuses on *perceptions* of believability, made up by beliefs about source expertise and trustworthiness, which may correspond or not with whether the messages are factually accurate.

Other classic work has posed that source credibility exhibits additional dimensions, including dynamism, competence or qualification, goodwill, and objectivity (Berlo, Lemert, & Mertz, 1969; McCroskey & Teven, 1999; Whitehead, 1968). Dynamism, for example, includes characteristics such as whether the spokesperson is extroverted, energetic, active, and decisive, and qualification includes perceptions of the source’s experience, skills, and competence (Berlo et al., 1969). Goodwill, which is derived from Aristotle’s concept of *ethos* and is sometimes referred to as the “lost dimension” of credibility due to a relative dearth of research, is defined as the intent of the information source to the receiver (McCroskey & Teven, 1999). However, despite suggestions of additional dimensions, expertise and trustworthiness have remained the most steadfast definitional components of credibility over decades of research (see, e.g., review in Pornpitakpan, 2004). Sources of health messages, surely, must be both trustworthy and expert, as both well-meaning laypeople (e.g., a faith healer or misinformed fellow sufferer) and “experts” with less than trustworthy motivations (e.g., a snake oil salesman or pharmaceutical company) might share health information that is low in credibility.

Credibility research can generally be broken into three major categories, as researchers have primarily examined the credibility of the source, the message, and the medium or channel (Metzger, Flanagin, Eyal, Lemus, & McCann, 2003; Rieh & Danielson, 2007; Wathen & Burkell, 2002; Wilson & Sherrell, 1993). Factors in all three of these categories have been found to impact overall credibility perceptions, and variance of characteristics in one dimension (e.g., the message) may influence perceptions of credibility in another

dimension (Metzger et al., 2003; Rieh & Danielson, 2007; Wathen & Burkell, 2002; Wilson & Sherrell, 1993). For example, differences in message characteristics such as the completeness of the information or argument presented can impact perceived source credibility (Dutta-Bergman, 2004).

Source cues that might be important for evaluation of shared health information include source qualifications and credentials, reputation, and absence of a commercial motive for sharing the information (see, e.g., Metzger & Flanagin, 2015). Additionally, individual differences of the information evaluator (also referred to as “audience” or “receiver” characteristics) can influence perceived credibility, and characteristics of all four of these factors—source, message, media, and individuals—can interact to influence overall credibility perceptions. Thus, while the focus is on source credibility and health and risk messaging, it is important to note that other factors, such as characteristics of the message and information receiver, may also exert a significant impact on information evaluation, persuasion, and behavior that is relevant to health and risk messaging.

Much of the research and theory in the area of credibility has stemmed from the persuasion literature. Decades of study findings suggest that increased credibility of a source or message predicts more persuasion and attitude change (see, e.g., Berlo et al., 1969; Hovland & Weiss, 1951; Petty & Cacioppo, 1986; Pornpitakpan, 2004; Sternthal, Phillips, & Dholakia, 1978). Additional research has examined areas such as how use of evidence in a message can positively influence perceptions of source credibility. For example, research suggests that lower credibility sources can use additional evidence to enhance their impact on audiences despite their relatively low credibility (McCroskey, 1969). Similarly, research on the effects of argument quality in persuasion (e.g., Petty & Cacioppo, 1986) has explored interactions between the quality of the argument and the credibility of the source on attitudes and behavior. For example, when thoughts generated about a message are negative because the argument is low quality, highly credible sources are less persuasive than sources with lower credibility (Tormala, Brinol, & Petty, 2006). Other recent work has posed that both argument quality and source expertise can impact trust in health information via the mediator of the perceived quality of the information (Yi, Yoon, Davis, & Lee, 2013).

However, in some specific circumstances the influence of source cues on persuasion may vary in interesting ways. For example, when people are already favorable toward the topic of a persuasive message, a moderately credible source is actually more effective, in terms of attitude change and thoughts in favor of the argument made by the source, than a highly credible source (Sternthal, Dholakia, & Leavitt, 1978). The authors suggest that when the source is of more questionable credibility, individuals may wish to more strongly support their own initial (already favorable) position. Comprehension is another important moderator of the effect of source cues on persuasion. For example, source expertise has more impact on attitudes when message comprehension is low (Ratneshwar & Chaiken, 1991). This suggests that when a health message is communicated by a perceived expert,

such as a physician, attitude change may occur even if the patient has relatively low comprehension of any complex medical information or jargon included in the message. This has important implications not just for health message credibility research, but also for health literacy research.

With the increase in use of the Internet as a source of health and other information, scholars have become interested in applying aspects of the persuasion literature to help frame studies of credibility assessment online. For example, scholars have compared differences in credibility perceptions between traditionally “offline” and “online” media (e.g., Flanagin & Metzger, 2000). In the last decade or so, credibility perceptions between traditionally offline media sources (e.g., newspapers, television) as compared to online media sources (e.g., social media, health websites) or face-to-face communication have arguably moved toward convergence as “new” media and the Internet have become more pervasively used and trusted. However, these perceptions can vary by factors such as how much an individual uses and is proficient in using the Internet and social media (e.g., Flanagin & Metzger, 2000, 2013; Hocevar, Flanagin, & Metzger, 2014).

The rise of studies of technologically mediated communication has also corresponded with the collapse (for some scholars) of the original theoretical distinctions between source and medium. For example, some researchers have considered the source and medium to be a similar or the even same construct in studies of technology- or computer-based media (see Metzger et al., 2003; Sundar & Nass, 2001; Wathen & Burkell, 2002). Consider the case of a health website. An individual may consider both the source and the medium of a message shared on the Internet to be the website on which it is shared. While the source of a message is classically thought of as the originator or author of communication, psychologically, a source is whoever the information receiver or evaluator perceives the source to be (see Sundar & Nass, 2001). Thus, the source/medium distinction may be less important in credibility research in the contemporary media environment than it was when much of the credibility and persuasion research originated in the mid-20th century.

More recently, some scholars have begun to differentiate between “original sources” (e.g., a doctor or patient) and “selecting sources” (e.g., a media source) in online research. For example, research has found that characteristics of both the original source and selecting source, as well as message characteristics, can impact credibility perceptions of online health messages (Hu & Sundar, 2010). Specifically, depending on the nature of the health message, a layperson’s (original source) message posted in an online context such as a blog or bulletin board (selecting source) may be more credible, but a physician’s health information tends to be more credible when posted on a website (Hu & Sundar, 2010). This again indicates that as more health information moves online, the conceptualization of both the source and its credibility grows more complex.

Traditional Models of Credibility and Information Evaluation

Some of the most prevalent models and theoretical frameworks in credibility research are those that focus on dual processing of information, and many of these models stem from traditional research in persuasion. Dual processing models suggest that individuals evaluate information through different cognitive routes depending on the amount of cognitive resources they wish to or are able to expend. These models, which include the heuristic-systematic processing model (HSM; Eagly & Chaiken, 1993) and the elaboration likelihood model of persuasion (ELM; Petty & Cacioppo, 1986), suggest that persuasive messages can be processed through two cognitive routes. The first route is a more cognitively effortful route (termed “systematic” in the HSM and “central” in the ELM), and the second is a less effortful heuristic (HSM) or peripheral (ELM) route. Both of these models have been widely applied in credibility research, and are of particular importance in the context of health information that may be complex and challenging for an individual to process.

Heuristic processing uses heuristic cues, or knowledge structures developed through past experience that allow people to minimize cognitive effort when making a judgement about the persuasiveness of an argument (Eagly & Chaiken, 1993). Surface-level source cues such as attractiveness of the source are often used to guide evaluation when individuals are heuristically processing information. Systematic processing, on the other hand, involves a more comprehensive and effortful analysis of information, which requires more cognitive ability and capacity. Both models suggest that an individual’s motivation and ability will influence which type of processing he or she uses when considering an argument or message.

Petty and Cacioppo’s (1986) ELM and Chaiken and colleagues’ HSM (Chaiken, Giner-Sorolla, & Chen, 1996; Chen, Duckworth, & Chaiken, 1999) also suggest that people are motivated to hold “correct” (or accurate) attitudes. In the context of health and risk messaging, accuracy would seem a likely motivation for message processing. However, while the HSM initially posited that high levels of this “accuracy motivation” would lead to more effortful systematic processing, later versions of the model have suggested that in many situations other motivations may interact with or even override any need to be objectively correct or accurate in one’s assessment of information (see Chaiken et al., 1996).

In addition to the accuracy motivation, the HSM poses a defense motivation, or desire to hold opinions that are congruent with existing beliefs when those beliefs are closely tied to the self. This defense motivation can result in a self-serving bias in information processing, such that information is processed selectively to meet the needs of the information receiver (Chaiken et al., 1996; Chen et al., 1999). This defense motivation might be relevant in the domain of health, particularly when people wish to receive information that

conforms with their existing or potentially desired health beliefs, such as a desire to seek comforting information or information that supports an individual's current health habits. This has intriguing implications for credibility perceptions as people evaluate health information they find online.

The ELM additionally indicates that motivation to process a message can vary by a number of individual characteristics of the message receiver, including personal relevance of the information ("issue involvement"), perceived personal responsibility to process a cognitive task, prior knowledge or attitudes, and need for cognition, which is defined as the desire to cognitively structure, understand, and reason with information. Issue involvement can influence message processing such that when an issue is highly relevant to an information evaluator, attitudes about the issue are primarily influenced by message quality, rather than source expertise (Petty, Cacioppo, & Goldman, 1981). This suggests that when information seekers are exposed to messages about health concerns that are personally relevant to them, they may be more likely to focus on and be influenced by message characteristics, potentially such that they override source credibility cues. Further exploration of what circumstances and to what extent this occurs would be an interesting direction for future research.

Finally, it is important to note that some scholars have posited a model counter to these dual-processing theories. This "unimodel" suggests that persuasion can occur through a single route, and that beliefs about information credibility are formed based on evidence (Kruglanski & Thompson, 1999). Derived in part from Lay Epistemic Theory (Kruglanski, 1989), this model mirrors the HSM and ELM in that it agrees that evaluation is impacted by motivation and ability. However, it expands the number and type of motivations that may impact information evaluation from those posited by the HSM, elaborates on the theoretical conceptualization of cognitive ability, and also attempts to further explicate the concept of evidence. While dual-processing models have received more attention in credibility research, it is worth noting the core argument inherent in the unimodel, which counters the dual-processing assumption that there is a difference in processing message arguments versus cues "outside" the message, such as source cues.

Models of Credibility Online

More recent theoretical work has focused on modeling credibility evaluations specifically in the context of information shared via networked digital technology. It is undeniable that many people today seek health information online, even when that information may come from myriad sources and possess variable accuracy. Thus, it is important to examine source credibility of health information in the online context. Like models of persuasion and information processing previously discussed, most models of online credibility focus on both source and message factors. For example, one model, which uses the term "cognitive

authority” synonymously with credibility ascribed to a website or to information from that website, suggests that verification of the factual accuracy of information from a site is a component of assessing credibility (Fritch & Cromwell, 2001). This, in combination with the assessment of other source factors such as author, institutional, and affiliation credibility, leads to the attribution of cognitive authority to a source.

Warranting theory has also been extended from its initial utility in understanding online self-presentation (Walther & Parks, 2002) to be used in studies of online information evaluation more broadly. The theory posits that information credibility is influenced by its warranting value, or the information seeker’s perception that the information can be manipulated by the source it describes (DeAndrea, 2014). In other words, people are less likely to believe information that is highly controlled by its source. Only recently extended to the context of online health information, research based in this theory has found that disclosing information about affiliations with health organizations or pharmaceutical companies negatively impacts both health behavior and perceptions of drug information, including reducing trust in the source organization, likelihood of recommending the drug, and likelihood of sharing the information (DeAndrea & Vendemia, 2016).

Sundar’s (2008) MAIN model takes the idea of use of cognitive heuristics from traditional dual processing models of persuasion such as the HSM, but focuses on their use in the contemporary media environment. Specifically, this model suggests that four technological affordances of digital media, or capabilities possessed by digital media that enable certain actions, can cue cognitive heuristics that influence credibility perceptions. The model suggests that the first affordance, *modality* (e.g., text, audio, visual), may cue different heuristics, resulting in different judgements of perceived credibility. The second proposition of the model is that cues related to the *agent* (e.g., website domain, computer, or individual posting on a website) might influence credibility perceptions. This part of the model corresponds most closely to traditional definitions of source credibility, however, it lacks an express definition of how the agent and source compare.

Next, the MAIN model poses that *interactivity* cues, which indicate the extent to which a medium is responsive to the user and also that a user can be both a source and receiver of content, can impact evaluation of online content. Finally, *navigability* (i.e., the perception that one can easily move from one online “space” to another) is also posited to influence perceptions of Web content, including its credibility. In general, Sundar’s (2008) MAIN model, like others, suggests that both source and message characteristics, as well as their interactions, can impact credibility judgement.

Sundar additionally argues that digital media users are likely to evaluate the credibility of online information based on surface characteristics using the heuristics suggested by the MAIN model, rather than carefully or systematically evaluate the content or information. Indeed, some research has suggested that people do frequently use heuristic cues when forming credibility judgements about online information (e.g., Hilligoss & Rieh, 2008;

Metzger, Flanagin, & Medders, 2010). However, it is worth noting that many heuristic cues that could indicate trustworthiness and expertise are limited in the online environment; for example, the original source of some health information can be obscure if the information gets repurposed from one website to another. This can leave health information seekers to pass judgement on health messages based on potentially scarce or difficult to interpret information.

Other research similarly suggests that perceptions of online information involves an evaluation of surface features of a website, such as appearance, design, and organization (Fogg et al., 2003; Wathen & Burkell, 2002). For example, the more structural features that are present, such as links or a navigation bar, the more credible a health website is perceived to be (Rains & Karmikel, 2009). However, other research indicates that surface features, such as design, do not override the impact of source credibility. In other words, while a well-designed site can enhance the credibility of an experienced source, appealing web design cannot counterbalance low source credibility in evaluations of health information (Westerwick, 2013). Additionally, the number of message characteristics, such as statistics and quotes, as well as a clearly identifiable source, are positively related to attitudes about a health topic when assessing a health website (Rains & Karmikel, 2009). Finally, the extent of the completeness of information on health websites positively impacts how the information seeker assesses credibility of the original source (e.g., author) and website (Dutta-Bergman, 2004). In sum, both source and message characteristics can impact credibility perceptions (Eastin, 2001), but characteristics of the message can also reflect back on judgements of the source's credibility.

Wathen and Burkell's (2002) model similarly suggests that credibility perceptions are based upon an evaluation of the information provided by a website, including both source and message cues. Specifically, the model poses that credibility judgements involve evaluations of source credibility (i.e., source expertise and trustworthiness) and message credibility, which includes informational content, relevance, currency, and accuracy. Accuracy and reliability are important cues to individuals across different cultures when making judgements about health information quality (Yi, Stvilia, & Mon, 2012). Likewise, Metzger (2007) noted that the digital literacy literature suggests five criteria that users should focus on when evaluating the credibility of information online: accuracy, authority, objectivity, currency, and coverage/scope. Systematically going through these criteria when evaluating Internet information can be considered a "checklist" approach to credibility assessment online. While research indicates that few information seekers actually use such a checklist approach or systematically evaluate Web-based information using all these criteria (Flanagin & Metzger, 2000, 2007), the criteria do indicate again that it can be difficult to disentangle characteristics that are tied to the source versus the message when forming credibility judgements, particularly in the online environment.

Metzger's (2007) dual processing model of credibility assessment helps move dual processing models like the heuristic-systematic processing model (HSM; Eagly & Chaiken, 1993) and elaboration likelihood model of persuasion (ELM; Petty & Cacioppo, 1986) to the context of credibility assessment of online information. Like the HSM and ELM, this model suggests that a Web user's level of motivation and ability to process information will

influence his or her level of critical evaluation of that information. Furthermore, the model says that the motivation to find accurate information online may vary widely depending on the purpose of the information seeking and the consequence of finding inaccurate information.

This suggests that information processing may vary depending upon the domain of the information and the personal importance or relevance of that domain to the information seeker. Specifically, systematic/central evaluation would be more likely when the user is both motivated and able to evaluate information, and heuristic/peripheral processing more likely when the information seeker is less motivated or less able to devote cognitive resources to evaluating the information. Presumably, a health concern that drives information seeking and processing is often personally relevant, and motivation to find accurate information should be high, suggesting that systematic or central processing is more likely for health and risk information. However, this relationship may be moderated by individual factors.

Characteristics of the information seeker or receiver, such as past experience with an information source, self-efficacy, and prior experience with the Internet (Flanagin & Metzger, 2007; Hocevar, Flanagin, & Metzger, 2014; Rieh & Danielson, 2007) have been found to influence credibility perceptions in the online context. For example, people higher in need for cognition and lower in trust for others tend to be more concerned about the credibility of (general) online information (Metzger et al., 2011). Drawing from theories of self-efficacy, research has found that people higher in social media self-efficacy, or perceived ability and skill to reach desired outcomes in the social media environment, tend to find information from social media more credible across information domains, including the health domain, than those who are lower in this type of self-efficacy (Hocevar et al., 2014). This suggests that the social community of sources and seekers of online health information may have a powerful effect on perceptions of the credibility of any health information shared, even when that information is shared by a patient rather than a physician.

The world of social media can also complicate health messaging further, as social media allows not just cues and messages from a single source, but layers of sources and messages within threads. For example, not just a health message itself (e.g., a credible public health service announcement), but social comments on that message, can influence health attitudes and behavioral intentions, although this can vary depending on the expertise of the commenter (Kareklas, Muehling, & Weber, 2015). Thus, even when health messages are shared by an initial professional or credentialed source, information seekers may additionally be influenced by the comments and opinions of fellow laypeople.

Other relevant findings from the literature are that people who have more Web experience indicate that they evaluate the credibility of Web information more than less experienced users, but there is evidence that they actually do not (Flanagin & Metzger, 2007), and that people exhibit optimistic biases about their own ability to evaluate Internet information properly (Metzger, Flanagin, & Nekmat, 2015). This is again potentially problematic in the context of online health information, as people may feel overly confident in their ability to assess its credibility. Finally, familiarity with a topic or medium can also positively influence

perceptions of credibility (Fogg & Tseng, 1999; Gefen, 2000). This finding is significant both online and offline, where the positive credibility influence of familiar topics—and conversely, the potential for information about unfamiliar topics to be found less credible—may be important to health and risk messaging. Many health topics, such as technical or scientific medical and risk information, may be unfamiliar to audience members. Thus, the impact of source credibility on perceptions of health-related risk messaging is of significant concern.

Risk Communication and Source Trust

Trustworthiness and expertise of the source, whether an organization or individual spokesperson, are both important when communicating health risk messages to the public. In addition to clear evidence, trust in the communicator may help individuals navigate uncertain and potentially confusing situations involving health risk assessments and any related action they may need to take. Unfortunately, however, trust in the types of public organizations that often communicate risk information is variable (Kramer, 1999), and there is often a difference between the public's perceptions of what risk management organizations do and the actual mandate or scope of those organizations (Renn & Levine, 1991). Further, people of lower socioeconomic status may be less likely to trust or find government sources to be credible (Heath & O'Hair, 2009). This suggests not only that source trustworthiness is an important part of health risk communication, but also that organizations that disseminate such risk information may need to work to educate and communicate with the public before they can expect trust, and thus any attitude change or action based on their recommendations.

An additional historical concern within the health risk communication literature is a disparity between health risks as perceived by individuals and actual risks as assessed and communicated by scientific organizations (Slovic, 1987). For example, some scholars have suggested that the public is more concerned about risks of perceived higher consequence, even if they are low probability, than they are about higher probability but lower significance risks (Renn & Levine, 1991). This again indicates that the credibility of any organization or individual communicating about risks to the public can have a significant impact on the health of an affected population, as organizations that are more trustworthy may be better able to address this issue and narrow the discrepancy between public perceptions and scientific calculations of health risks.

Like other health messages, evaluation and behavior based on risk messages are impacted by both source and message factors. Additionally, individuals are often faced with risk information from different sources (e.g., government- or industry-sponsored health information, health information from a patient group, pharmaceutical company, or one's own physician), and such information may occasionally be in conflict. For example, higher perceived credibility of government-sponsored health messages, as well as low perceived credibility of relevant health citizen groups, predicts heuristic processing of messages, which, in turn, predicts lower perceptions of risk when the government message indicates low risk to the population (Trumbo & McComas, 2003). This suggests that when government sources are trusted, risk messages are processed with relatively little systematic consideration. On other hand, when individuals perceive government sources to have lower credibility and citizen groups to have higher credibility, they are more likely to systematically process messages, which is a predictor of greater risk perceptions when citizen groups share alarming information (Trumbo & McComas, 2003).

Finally, risk information is often technical and difficult for the public to understand, particularly when those receiving the information are lower in health literacy. Research suggests that when presented with a range of risk information (e.g., the risk to an individual is between 1 in 100 and 1 in 1,000), instead of a static risk number or percentage, people find the information source to be more honest or trustworthy, although this does not necessarily offset any concerns about the competence of the information source (Johnson & Slovic, 1995). Additionally, people also perceive lower risk estimates to be less credible (Johnson & Slovic, 1995), again suggesting that the public may have inflated perceptions of health risk. To address this, at minimum high-credibility sources may wish to share health risk information as a range to increase the perceived credibility of the message.

Overall, while source expertise is unequivocally important in evaluations of risk information, source trustworthiness may be as or more significant. There are a number of recommendations in the risk and crisis communication literature that may help increase trust in an information source that communicates health risk information. For example, increasing the ability of the audience to identify with the spokesperson (e.g., by having the spokesperson show compassion and understanding), and being open to the requests and needs of the public while still meeting institutional objectives can both positively impact trust, as can increasing organizational transparency and providing honest, complete, and accurate information to the public (Coombs, 2014; Heath & O'Hair, 2009). In situations in which an organization's level of credibility is low or needs to be restored after a crisis, the image of the organization as a trustworthy source must be reestablished before it can again effectively communicate information about health risks or crises to the public (Heath & O'Hair, 2009). Enlisting the help of additional credible sources, such as physicians or members of the healthcare system, can also help when disseminating risk messages.

Indeed, health risk messages should come from high credibility sources in order to be taken seriously by the public, and the messages should also be repeated through multiple media channels (Heath & O'Hair, 2009). However, some scholars have suggested that repetition of a persuasive health message, if taken too far, can have unintended results on credibility perceptions. Specifically, while message repetition initially predicts an increase in perceived credibility, once a message is repeated too many times it can lead to a decrease in trust in the source and a decrease in overall message credibility, in both health and other contexts (Reinhard, Schindler, Raabe, Stahlberg, & Messner, 2014). Finally, using multiple media channels, including a website with up-to-date, honest, and accurate risk information, can also help increase trust in the information source and help the public stay informed during a health risk or health crisis situation (Heath & O'Hair, 2009).

Source Credibility in the New Health Information Environment

As noted, conceptual definitions of source credibility—particularly the dimension of expertise—have shifted over time as use of social media and user-generated online information has increased (Pure, Markov, Mangus, Metzger, Flanagin, & Hartsell, 2013; Flanagin & Metzger, 2013; Warnick, 2004). Earlier definitions of source credibility relied on the source's credentials as indicators of expertise on a given topic. In the area of online health information, credentials such as medical degrees or professional and clinical experience are likely still very important to assessments of source expertise. However, other factors, like personal experience with a health issue may also lend a level of perceived expertise to Internet users who share information but lack traditional credentialed expertise (Eysenbach, 2008; Eysenbach, Powell, Kuss, & Sa, 2002).

This *experiential credibility*, or credibility assigned to a source based on his or her personal experience, has been posed to potentially influence evaluations of online user-generated information in a variety of domains (Flanagin & Metzger, 2013; Pure et al., 2013). While experiential credibility can certainly be assigned to offline sources of health information such as friends, family, or fellow patients, often people may not have offline friends or family in their close social network with whom they share very similar health experiences (Cullen, 2006). Thus, people may be specifically drawn to reading about the experiences of others who share their health concerns online (Sillence, Briggs, Harris, & Fishwick, 2007), indicating that experiential credibility may be of specific note in the online context.

Experiential credibility can be afforded to online information providers who might not be traditionally considered experts in the health domain, for example, laypeople who suffer from the same health problem (Metzger & Flanagin, 2011). Some research in experiential health information provision has found that while source credibility is perceived to be higher for a credentialed health institution than for a patient, experiential information from a layperson can have a powerful effect on attitudes and self-efficacy toward health behaviors (Neubaum & Kramer, 2014). Further, because information from these types of information providers may be aggregated by websites and social media, this compounded experiential expertise may have significant effects on health information seekers. For example, research suggests that as information from Internet users is pooled, the impact of their collective experiential credibility on others' perceptions of the credibility of their information increases as the number of people contributing information increases (e.g., Flanagin & Metzger, 2013).

This effect of the volume of opinions has also been seen in studies of health information shared via social media. For example, when a credentialed source (e.g., a physician) with many followers tweets, it is perceived to be more credible than if a layperson tweets, even if he or she also has many followers (Lee & Sundar, 2013). Interestingly, retweets showed a different pattern: when a credentialed source with many followers retweets health information, it is perceived to be less credible than a layperson's retweet when that layperson also has many followers. This again shows the complex nature of credibility,

particularly in the context of online, social health information. Additionally, the credibility of tweets is positively predicted by the expertise of the source, but the credibility of retweets is positively predicted by the trustworthiness of the initial source (Lee & Sundar, 2013).

These findings suggest that heuristics based on social influence may impact credibility perceptions. Online, information seekers frequently do not spend time critically evaluating the information they find and instead tend to use these types of heuristic cues that guide information evaluation while minimizing cognitive effort (Hilligoss & Rieh, 2008; Metzger, Flanagin, & Medders, 2010; Sundar, 2008). Two of the cognitive heuristic cues frequently used by online information recipients are reputation and endorsement (Metzger et al., 2010). Thus, people are more inclined to perceive sources to be credible if others do so as well, and tend to trust sources that are recommended by others or provide aggregated information, as many ratings and review sites do. Research has also confirmed that people's perceptions and attitudes can change depending on perceptions of others' opinions (Sundar, Oeldorf-Hirsch, & Xu, 2008), and that the information provided by others can influence new user-generated information on the same topic (Flanagin & Metzger, 2013). Further research indicates that negative comments about health information from an individual's online network can significantly decrease credibility perceptions of that information, particularly if the comments appear to come from friends (Gao, Tian, & Tu, 2015). This suggests that communities that share health information or personal health experiences online, whether for social support or educational purposes, may impact information seekers even if they lack significant content from credentialed sources.

Identity and Credibility

Research in online health information seeking and evaluation also indicates that people are more likely to seek out, positively evaluate, and select information from online health information sharing communities (e.g., fellow sufferers) using heuristic cues of perceived similarity with the health information sources even if they do not know them personally offline (Sillence, Briggs, Harris, & Fishwick, 2007). This impact of perceptions of similarity between an information source and seeker on information evaluation and persuasion is an area of research that stems from a rich theoretical heritage. Theories of social identity and self-categorization indicate that perceptions of shared group membership, such as similarity and shared traits between people, can have a powerful influence on attitudes and behavior. Specifically, these theories pose that the identity of an individual is dependent upon group identification and that individuals frequently act based on a perceived shared group identity (Tajfel & Turner, 1986; Turner, 1991). This suggests that any perceived similarity between an information seeker and a source may significantly impact credibility perceptions (see also Metzger, Flanagin, Eyal, Lemus, & McCann, 2003).

Research has indeed demonstrated that perceived source similarity positively predicts credibility judgements across different topic domains, both online and offline. For example, similarity between the information source and seeker has been found to positively predict credibility assessments of user-generated online information as well as the likelihood that evaluators will act on that information (Flanagin, Hocevar, & Samahito, 2013). Similarity between an information evaluator and a source can also have a significant impact on health behavior (Wang, Walther, Pingree, & Hawkins, 2008). For example, perceived similarity between the self and a spokesperson significantly predicts multiple dimensions of credibility (e.g., expertise, trustworthiness), which in turn predict diet and exercise self-efficacy through the mediator of para-social identification (Phua, 2016). Identification with a message source has also been found to mediate the effect of source credibility on attitudes and information overload via social media, such that when health information is delivered via social media people feel less overloaded and react more positively to the information when they identify with the organizational information source (Stephens, Goins, & Dailey, 2014). In sum, both similarity and identification with an information source can have a powerful impact on our processing of health messages, as well as our likelihood of taking actions recommended by the message.

Along with similarity, there is some research indicates that ethnic identity may have important moderating effects on the impact of source credibility. For example, Spence, Lachlan, Spates, Shelton, Lin, and Gentile (2013) explored ethnic identity as exhibited by cues relevant to African Americans on a Facebook page. When evaluating a health-related Facebook post, African American information seekers found source credibility to be higher for sources that exhibited high African American ethnic identity, while white evaluators found credibility for those sources to be lower and rated posts that exhibited lower African American ethnic identity as higher in source credibility. The authors suggest that this finding—specifically, that ethnic identity may increase or decrease the perceived credibility of spokespeople on social media—has important implications for health messages targeted at traditionally underserved populations.

While some research (e.g., Perea & Slater, 1999) has examined the impact of culture, such as individualism and collectivism, on perceptions of group versus individual risks and related perceptions of credibility and believability, more research in this area is warranted. For example, Perea and Slater (1999) found a stronger association between gender and perceptions of credibility of individualistic and collectivistic health messages than between an individual's culture and these perceptions, with females from both Anglo and Mexican American backgrounds rating collectivistic health messages as more believable, and males preferring individualistic messages. Further examining the impact of source credibility on underserved populations, as well as what additional cultural factors might positively impact perceptions of health messages in these and other populations, is an important avenue for future scholarship.

Directions for Future Research

The research reviewed here indicates a growing knowledge of the impact of source characteristics on online health information, but as more health messaging is spread via social and other online media, this is still a developing research area. For example, despite the wealth of advice, stories, and information from sources with experiential credibility that is shared and sought online, relatively little research has examined what effect this information has on Internet users' health attitudes and behavior (e.g., future health information seeking or health behaviors). A number of studies have examined the accuracy of health information online, but these studies tend to focus more on the curated and credentialed information of health websites than on the more personal and experiential health information transmitted via social media. This is understandable to the extent that this type of research was particularly common in the early-to-mid-2000s and before (pre-social media). However, even more recent research still has not specifically focused on the range of personal posts about health experiences shared by patients via online communities and discussion forums, their actual or perceived credibility, and their ultimate impact on health information seekers.

Future research should also be conducted on the impact of source credibility on selective exposure to health messages. Selective exposure, or a tendency to seek out information to support preexisting attitudes, may be particularly likely in the online environment due to the wealth of information available that likely includes attitude-congruent sources and content (Garrett, 2009; Garrett, Carnahan, & Lynch, 2013; Hartsell, Metzger, & Flanagin, 2012). The assumption of much selective exposure research is that people prefer to avoid dissonant information, and are motivated to defend their existing attitudes and beliefs by both avoiding information that might challenge these beliefs and seeking out information that may support them (Eagly & Chaiken, 1993; Festinger, 1957; Hart et al., 2009).

This has implications both for health information seeking and credibility research. For example, while individuals believe unbiased sources to be more credible than those that are biased, they still seek out (i.e., selectively expose themselves to) biased sources in order to expose themselves to attitude-consistent information (Hartsell et al., 2012; Metzger, Hartsell, & Flanagin, 2015). Most recent selective exposure research has explored the domain of political or news information, focusing on information that is threatening to preexisting political attitudes or issue-related values (e.g., Borah, Thorston, & Hwang, 2015; Garrett, 2009; Garrett et al., 2013; Knobloch-Westerwick & Meng, 2009; Metzger et al., 2015), rather than on information that is threatening to perceptions of health. However, people may be even more likely to seek out information that conforms to their preexisting attitudes about their health, including current beliefs about their health behaviors or desired health outcomes, given how threatening health issues can be.

Some research is beginning to explore this area. For example, Westerwick, Johnson, and Knobloch-Westerwick (2016) found that greater discrepancy between one's own health behavior and recommended health behaviors predicts selective exposure to related health information, which in turn predicts attitudes. In other words, the perception that an individual has not currently reached his or her desired health status may drive time spent

looking at related health information (particularly when the individual desires health self-improvement), which then predicts attitudes about that health information. Interestingly, however, despite theoretical reasons to expect differences based on source credibility, Westerwick and colleagues found no difference in this pattern if the health information was from a low- or high-credibility source. Other research has also found that while individuals tend to say that source credibility is important to health information selection, observation of information search behavior suggests that source credibility cues are sought relatively infrequently (Eysenbach & Kohler, 2002). This study focused on information seekers' more overt or systematic credibility cues, but heuristic credibility cues may indeed drive selection of health information. What these cues are, and how they may influence selection decisions in concert with other cues, has not been studied. Overall, these findings suggest that the interactions between source credibility, health message selection, and resulting attitudes and behavior is still a rich area for future research.

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