
In this article, the author reviews recent research focusing on science communication in the online environment and the implications for science in the 21st century. The author addresses several important insights into science communication research including: What motivates individuals to seek science-related information online; the nature of the science-related content encountered; and, how the Internet is changing public knowledge and attitudes about science.

First, the author states that most science-related information seeking is the result of either educational activities or some degree of media attention to news events. Overall, the most frequently explored empirical motivators include feeling strongly about a scientific issue, expecting to have to talk about it, having to address it in an educational setting, or having noticed it covered in the media.

Second, the author states that while some science issues are covered equally, in terms of frames used, evaluations provided, and actors mentioned both online and offline, other issues, such as nanotechnology, differ significantly in their coverage online and offline. Therefore, many individuals seeking information online experience different dimensions of the issue than those covered through the traditional news media. For example, as search aggregators become the first entry point for many individuals in seeking science information, the reliance on algorithms and other audience metrics contribute to the “self-reinforcing information spiral.” Finally, the author mentions the importance of accuracy and trustworthiness of content online. The author dismisses such concern as most individuals who are motivated to seek information online pay attention to only those writings by authors whom they perceive as having greater expertise.

Third, the author notes how the Internet is changing public knowledge and attitudes about science. In so doing, the author claims that Internet use is reducing the gap between knowledge levels among different socioeconomic characteristics. Specifically, the author notes how news stories may be interpreted differently based on user-generated comments. For example, among those individuals who support a certain technology, after being exposed to uncivil comments, they perceive more risks in the technology than those exposed to civil comments. Furthermore, those who were exposed to uncivil comments were more likely to see bias in the news story than those exposed to civil comments, even though they saw the same story.

In concluding, the author states that future research should examine how science stories go viral; how Twitter is used as a science communication platform; and the potential for social networks to communicate science information.

In this article, the authors begin by explaining how past literature is less than ideal in understanding how scientific beliefs are formed. First, most literature focuses on one form of communication in isolation from others. Second, empirical models don’t consider the feedback process that connects communication with beliefs. And third, models frequently tested focus on the best available data rather than broader considerations of the theoretical process involved.

Next, the authors describe how science information is portrayed across various media forms as well as how individuals selectively attend to certain forms of media based on their particular needs or interests. In regards to patterns of science information in media content, the author notes how most current models assume news coverage on science topics is roughly uniform and accurate, thus exposure increases accuracy of beliefs. However, as the authors note, this assumption is not always true and the authors suggest the amount and quality of news coverage on a topic as well as the extent and accuracy of how it is portrayed should ultimately determine accuracy. In regards to selective exposure, important background characteristics, including education and employment, influence interest and involvement with a topic. Furthermore, the authors make note of recent research that has established clear trends in partisan selectivity in news and opinion sources.

The authors then outline the various theories and models over the last 50 years of research that have addressed how the mass media can impact our thinking. These models include:

1. Cognitive Mediation Model
2. Knowledge Gap
3. Cultural Cognition/Knowledge Gap
4. Differential Gains/Intramedia Interaction
5. Intramedia/Intracommunication Mediation
6. Reinforcing Spirals
7. Extended Elaboration Likelihood Model and Entertainment Overcoming Resistance Model
8. Cultivation

Citing a lack of integration of these existing theories and models, the authors put forward their own model, Integrated Model of Communication Influence on Beliefs (IMCIB), which they hope will increase understanding regarding the larger processes and cognitive effects of communication about science. The significant distinction between the authors model and those previous is the classification of the key outcome as beliefs, which the authors state may be objectively accurate, objectively inaccurate, or neither. Furthermore, the processes described through their model (priors, direct communication effects,
mediation processes, moderation processes) are in fact feedback loops.

In the concluding section, the authors apply their IMCIB model to the issue of climate change as well as cite limitations to the model when using empirical data. Moreover, the authors state that the IMCIB model is primarily used for individual-level variables. Therefore, factors such as network structures and community level influences are not included although they may present significant implications.
In this article, the authors raise initial concern over the quantity of political information held (and participation engaged in) by the public and the political knowledge held (and participation engaged in) among social groups. Thus, as these levels rise among some groups but not others, it could have potential consequences for democracy. Furthermore, as mass media information increases, one hypothesis –“knowledge gap hypothesis”- states those individuals within a higher socioeconomic status will acquire this information at a faster rate than lower status segments, thus lending to gaps in knowledge. Empirically, the authors use survey data as part of the American National Election Study within the context of the 1996 U.S. presidential election campaign. Furthermore, they probe the knowledge gap hypothesis, in what they refer to as “communication effects gap”, to test whether the medium of communication (newspaper of televised news) may serve to eliminate or reverse knowledge gaps. The authors propose the following hypotheses:

H1: The gap between education level and knowledge would be smaller among heavy television news users than among light television news users.

H2: The gap between education level and knowledge would be larger among heavy newspaper users than among light users.

H3: The relationship between education and political participation would be stronger among heavy news users than among light news users. This pattern would be more distinct for newspaper use than television.

While the authors make note of the limitations of their study, specifically the use of longitudinal data and the ability to demonstrate causality or change over time, they do report findings consistent with trends in new research. The authors find that gaps in knowledge between higher and lower education groups are greater among light users of television news than among heavy users of television news. A similar pattern was found for newspaper use, although weaker. The author’s tie these findings to the growing field of literature that argues television news use may help to reduce political knowledge disparities across educational levels.

For example, the authors mention several reasons why television news-use has the potential to reduce gaps in knowledge: (1) Television news is more likely to frame stories in a personal or episodic manner than newspapers. Thus, personalized information fits more into the schema of less educated respondents. (2) Television news has the ability to use visuals as contextual information. For less sophisticated voters, this can reduce complex issue to more understandable terms. However, the authors note that while television may be closing gaps between high and low education groups, it may not have to do with facilitating learning, but rather inhibit learning by higher education groups. Therefore, the authors state television may act as an information ceiling, rather than a
learning medium. For example, those who have more education have little to gain from television content. Following this clarification, the author’s also note that it may be that higher educated individuals do not take appropriate measures to learn from television. For example, the authors note that they may put more effort to learning from newspapers than television. Conversely, the less educated believe that newspapers are beyond their skill level and can more appropriately learn from television news.