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Digital Media and Youth: Unparalleled Opportunity and Unprecedented Responsibility

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With the sudden explosion of digital media content and access devices in the last generation, there is now more information available to more people from more sources than at any time in human history. Pockets of limited availability by geography or status notwithstanding, people now have ready access to almost inconceivably vast information repositories that are increasingly portable, accessible, and interactive in both delivery and formation. Basic human activities have changed as a result, and new possibilities have emerged. For instance, the process by which people locate, organize, and coordinate groups of individuals with shared interests, the number and nature of information and news sources available, and the ability to solicit and share opinions and ideas across myriad topics have all undergone dramatic change as a result of interconnected digital media.

One result of this contemporary media landscape is that there exist incredible opportunities for learning, social connection, and individual entertainment and enhancement in a wide variety of forms. Indeed, recent evidence indicates that 45 percent of users in the United States say that the Internet played a crucial or important role in at least one major decision in their lives in the last two years, such as attaining additional career training, helping themselves or someone else with a major illness or medical condition, or making a major investment or financial decision.[1] Enhanced connectivity and information availability have changed not only *what* people know, but *how* they know what they know.

However, the wide-scale access and multiplicity of sources that ensure vast information availability also make assessing the credibility of information extremely complex. The origin of information, its quality, and its veracity are now in many cases less clear than ever before, resulting in an unparalleled burden on individuals to locate appropriate information and assess its meaning and relevance accurately. Doing so is highly consequential: assessing credibility *in*accurately can have serious social, personal, educational, relational, health, and financial consequences. As a result, determining trust, believability, and information bias—key elements of credibility—become critical as individuals process the information in their lives gleaned from digital media.

Understanding credibility in this environment is also important because it is a concern that cuts across personal, social, and political domains. For instance, digital media increasingly deliver information that results (or fails to result) in an informed citizenry that, in turn, drives the pursuit of particular social agendas, the degree and nature of engagement in public discourse, and the determination of public policy.[2] In addition, in light of the prevalence of interactions with others that now routinely occur online, personal and social identity is often established and known primarily or exclusively through computer-mediated interactions.[3]

Thus, the credibility of information sources is no longer necessarily a function of sustained, face-to-face interaction, nor is it established solely through the endorsement of those whom one knows personally or directly. Nonetheless, source credibility remains a key component of persuasion, with decision-making implications ranging from consumer choices to political candidate selection.

Contemporary youth are a particularly interesting group to consider with regard to credibility today. In many ways, this generation (demarcated roughly by birth around 1980, give or take a few years) is different from any before in its relationship to information technology, and also in its relationship to information sources.[4] Known variously as "The Millenials,"[5] the "Net Generation,"[6] "Digital Natives,"[7] and "Generation Y,"[8] members of this generation share the feature of having been immersed in an environment of digital technologies (e.g., computers and the Internet) for their entire lives. They have been described, for instance, as "digital natives in a land of digital immigrants" whose experience with digital media has led them to have "new and different expectations about how to gather, work with, translate, and share information."[9] Compared to their elders, they are more likely to turn to digital media first when researching a topic for school or personal use, to read news on the Internet than in a printed newspaper; and to use online social network tools to meet friends and to find information. In other words, the primary sources of information in their world are often (although not exclusively) digital, which is quite different from any generation prior.

Their special relationship to digital media greatly influences the way they approach learning and research.[10] As the first generation to grow up with interactive digital media, millennials are comfortable with collaborating and sharing information, and do so "in ways that allow them to act quickly and without top-down direction."[11] This, of course, has profound implications for credibility construction and assessment. The interactivity afforded by digital media has set up an expectation among many young people to play roles of both information source and receiver simultaneously as they critique, alter, remix, and share content in an almost conversational manner using digital media.[12] Here again, the implications of the uses of technology that are favored by young people present new and different challenges for both discerning and learning to create credible information.

Nonetheless, despite these realities, examinations of youth and digital media have often been somewhat crude, focusing for example on the popular generation gap caricature, where youth are portrayed as technologically adept compared with adults. Such considerations fail to focus on the most important and enduring by-products of heavy reliance on digital media: The impact of "growing up digital"[13] is that more and more of the information that drives our daily lives is provided, assembled, filtered, and presented by sources that are largely unknown to us, or known to us primarily in nontraditional ways. Yet, we have only begun to explore what this means, particularly for younger users who are not only immersed in digital media now but will be for the entirety of their lives.

In terms of credibility specifically, youth are also intriguing in large part due to the tension between their technical and social immersion and skill with digital tools and their inherent limitations owing to their limited development and experience. On the one hand, those who have literally grown up in an environment saturated with digital media technologies may be highly skilled in their use of technologies to access, consume, and generate information. This view suggests that in light of their special relationship to digital tools, youth are especially well positioned to navigate the complex media environment successfully. On the other hand, youth can be viewed as inhibited, in terms of their cognitive and emotional development, life experiences, and familiarity with the media apparatus. This perspective suggests that

although youth are talented and comfortable users of technology, they may lack crucial tools and abilities that enable them to seek and consume information effectively.[14]

As a way of beginning to understand the complex relationship between credibility, digital media, and youth, we proceed by first defining credibility after situating it in relation to allied terms and concepts. With this background, we consider credibility in the digital media environment, and examine the various credibility assessment strategies in use today, particularly those relying on group and social engagement. From there, we consider why credibility is worthy and important as a topic of inquiry, including what is and is not new about credibility in the context of digital media. Next, we examine the major issues with regard to credibility and, in particular, what special concerns arise for youth populations. Finally, we offer some perspectives of scholars, educators, and, most important, youth regarding credibility, and with this context we examine the research, policy, and educational implications. We conclude by considering the gaps to be filled in credibility research and providing recommendations for practitioners of all kinds who are affected by youth, credibility, and digital media.

Credibility Origins, Definitions, and Current Issues

Origins of Credibility Research

Scholarly interest in credibility dates back to Aristotle's writings on rhetoric and his notions of ethos (appeal based on the character of a speaker; e.g., reputation), pathos (appeal based on emotion; e.g., fear appeals), and logos (appeal based on logic or reason; e.g., the content of a speech). According to Aristotle, all three were necessary to be trustworthy,[15] although in his view credibility was mainly in the speaker and his or her ability to relate to different audiences. Ethos was thus "the communicator's ability to inspire confidence and belief in what was being said,"[16] and high-ethos speakers were considered fair, trustworthy, sincere, reliable, and honest.

Source credibility was addressed in earnest during the twentieth century by psychologists interested in studying persuasion, largely as a response to propaganda efforts during the World Wars. The "Yale Group," led by social psychologist Carl Hovland, defined credibility as expertise and trustworthiness and, for the first time, drew a distinction between source credibility, message credibility, and audience credulity.[17] In contrast to Aristotle's view, they suggested that credibility is a receiver-based construct and is determined by the acceptance of a speaker by the audience. The Yale group conducted numerous studies of source credibility as it pertained to persuasion and attitude change and identified the major components of what it means for a source to be perceived as credible by an audience. This work spurred a large body of research looking at both "source" and "message" credibility—characteristics of speakers and characteristics of messages or information.

The next major interest in credibility research came from professional rather than academic concerns. As television diffused widely in the 1950s, subscription rates for daily newspapers started to sag. As a result, newspaper professional organizations became interested in the perceived credibility of newspapers versus television (i.e., "media credibility"). The major finding in this domain was that the more people relied on a medium for news—television or newspapers—the more credible they believed that medium was.[18]

The study of credibility was resurrected in the late 1990s by the emergence of the Internet, the Web, and academic (psychology, communication, persuasion) and professional (news, e-commerce) concerns surrounding these technologies. In this domain, the Internet and

Web conflate notions of source, media, and message credibility, which formerly have been treated as rather distinct, or at least addressed largely separately.[19]

Defining Credibility

There exists no one, clear definition of credibility that has arisen from this heritage. Rather, the overarching view is that credibility is the *believability* of a source or message, which is made up of two primary dimensions: trustworthiness and expertise. Some secondary dimensions include source dynamism (charisma) and physical attractiveness, for example. Moreover, the two primary dimensions (trustworthiness and expertise) have both objective and subjective components. That is, trustworthiness is a receiver judgment based primarily on subjective factors. Expertise can be similarly subjectively perceived but includes relatively objective characteristics of the source or message as well (e.g., source credentials or information quality).

The study of credibility is highly interdisciplinary, and definitions are also somewhat field-specific. For example, communication and social psychology treat credibility as a perceptual variable: credibility is not an objective property of a source or a piece of information; instead, it is a subjective perception on the part of the information receiver.[20] Thus, this perspective emphasizes audience *perceptions* of credibility rather than the objective credibility of a source or piece of information. Information science perspectives, by contrast, view credibility as more of an objective property of information given that field's focus on defining credibility in terms of information "quality," which is how useful, good, relevant, reliable, accurate, and so forth some information is for a specific purpose. Thus, one key disciplinary distinction is that while psychology and communication tend to focus on *source credibility*, information science focuses instead on message or *information credibility*. Nonetheless, these distinctions are not perfectly clean. For example, source credibility is often a criterion for judging information credibility. Furthermore, researchers variously study the objective characteristics that make some source or piece of information *worthy* of being believed (e.g., a source's qualifications or how "good" a piece of information is compared to some accuracy metric), while others study what characteristics make sources or information *likely* to be believed by audience members (e.g., the attractiveness of a source or the congruence of some message with the receiver's own point of view).

Moreover, the notion of credibility is allied closely with several concepts, including trust, reliability, accuracy, reputation, quality, authority, and competence. Although several of these concepts include both of the core dimensions of credibility, some seem to more closely resemble the trustworthiness dimension (e.g., reputation, reliability, trust), while others seem to tilt toward the expertise dimension (e.g., quality, accuracy, authority, competence). It is beyond the scope of this discussion to elucidate the complex and intricate relationships between these concepts, but Rieh and Danielson[21] provide a useful discussion of this issue.

Understanding Credibility in the Digital Media Environment

Many studies of credibility of Web-based information rely in some form on the traditional distinctions of source, message, and medium credibility. *Source credibility* has conventionally considered characteristics of persuasive sources (traditionally, speakers), primarily expertise and trustworthiness, but also dynamism, composure, sociability, liking for the source, and similarity to the source.[22] Conceiving of Web sites as sources that engender greater or lesser credibility has shown that it is possible to translate several components of source credibility to the Web environment. Specifically, expertise may be communicated through the accuracy

and comprehensiveness of a Web site's information, its professionalism, and its sponsor's credentials.[23] Trustworthiness is associated with a Web site's integrity as demonstrated by its policy statements, use of advertising, professionalism, and firm or author reputation.[24] Attractiveness and dynamism, or how "entertaining" a site is, may be reflected in the site's use of colorful graphics, interesting content, or interactive features.[25] Finally, differences exist across Web content "sponsors": institutional Web sites are perceived as more credible than other types, for example, commercial, advocacy, and personal Web sites.[26]

Message credibility typically examines how message or information characteristics influence perceptions of believability. Major dimensions of message credibility include message structure, content, language, and delivery.[27] Although little research has directly addressed message credibility online, Internet users report very similar criteria in judging online and offline information.[28] Aspects of message content such as accuracy, use of evidence and citations, comprehensiveness, and currency have been shown to affect perceptions of the credibility of information online.[29] Moreover, Fogg et al.[30] found that structural characteristics of online messages, such as their organization (or navigability), and message delivery elements, like the presence of typographical errors, affect credibility assessments. Looking across the literature, several message attributes appear to affect credibility perceptions of messages when they appear online.

Finally, studies of *media credibility* focus on the relative credibility or believability of various media channels through which a message is sent. Cross-media comparisons have sought to assess the credibility of digital media relative to other communication channels, with mixed results. While some studies have found that traditional mass media (e.g., newspapers) are perceived as more credible than the Internet and Web,[31] others have found the opposite results[32] or have found no differences between traditional and digital channels of information.[33] Overall, research in this area indicates that although the Web is largely considered an equally credible source of information as compared to traditional venues, it may be perceived as more credible among those who are particularly motivated to seek out specific types of information and who may rely on the Web to a large extent.[34]

While conceptually tidy, Chaffee[35] argued that various dimensions of credibility overlap, and that many information consumers do not distinguish, for example, between the source of a message and the channel through which they receive the message. This type of convergence is especially pronounced in today's media environment that offers an astonishing amount of information, across various media, from a vast array of providers. Moreover, perceptions of credibility vary from person to person and between various media; digital media venues such as Web sites are themselves moving targets, constantly changing and evolving; users are also evolving, with regard to their experiences, capabilities, and the media environment in which they mature; and, there are many levels of analysis consider. For example, it makes sense to measure the credibility of the Web as a medium of communication, various forms or tools of Internet communication separately (e.g., Web sites, blogs, e-mail), entire Web sites, particular information or messages on a Web site, a site operator (e.g., nytimes.com), or individual authors of information (e.g., former *New York Times* reporter Jayson Blair). Thus, source, message, and medium credibility are overlapping concepts in many instances, and research designs that do not always enable clear distinctions among these factors complicate our current understanding of online credibility. Overall, such factors underscore the complexity of credibility in the current media environment.

Indeed, making sense of credibility today requires accounting for the various types of digital media and forms of information currently available, in order to understand how

individuals assess both information and source credibility, and how each of these influences the other. To date, however, research examining the credibility of information people obtain via digital media has primarily examined the perceived credibility of Web sites, as opposed to considering the full range of available digital information resources (e.g., e-mail, blogs, text messaging), and has tended to emphasize how individuals assess credibility in isolation, rather than considering group and social-level processes. Yet, in addition to commercial, informational, and other Web sites produced by organizations or individuals, blogs, wikis, social networking sites, and other digital media applications—linked across a wide variety of devices—constitute a significant portion of today's media environment. In fact, these tools may be especially popular among younger users.[36] It is crucial, therefore, to consider what new and emerging types of credibility and credibility assessment are implicated in these media tools.

To highlight this, we next propose a categorization of credibility construction, which is leveraged to draw attention to the range of relevant credibility assessment strategies available to information consumers today. This approach is intended to provide a way to organize and consider the diverse means by which information consumers understand, approach, and assess credibility in the contemporary digital media environment.

Contemporary Forms of Credibility and Credibility Assessment

A hallmark of the digital media environment is the ability of individuals to connect to one another more easily owing to reductions in the costs of communication and information sharing. Nonetheless, the majority of research on online credibility considers individuals largely as isolated appraisers of credibility, rather than as networked actors engaged with others. Group and social engagement, however, are crucial to credibility construction and assessment, and are likely increasingly important to younger user groups, which are the first to mature with a full appreciation of the potential of networked environments.

Processes of social endorsement—a fundamentally network phenomenon—have always been central to credibility. In communities where individuals and other entities are relatively well known to one another, a small number of endorsements can serve to effectively establish credibility. However, in large, relatively anonymous environments, personal connections become more tenuous. In these instances, credibility may be constructed by members of informally bounded groups of individuals who have some form of firsthand experience with the target under scrutiny, which can range from individuals, to products, to organizations or institutions, to which they lend their endorsement. In essence, endorsed credibility in the digital media environment compensates for the relative anonymity of tools like the Web with the sheer volume of users, at least some of whom have had private experiences that they make public via communication networks. The means of sharing these assessments can take many forms, resulting in several variants of credibility, most notably *conferred*, *tabulated*, *reputed*, and *emergent* credibility.

Credibility may be conferred on some information or its source when well-regarded entities, such as organizations, agencies, or associations, produce or recommend things like information repositories or service providers to information consumers. For example, libraries and teachers confer credibility on the information databases they make available to their patrons and students,[37] and doctors confer credibility on the sites they recommend to patients.[38] Similarly, organizations confer the credibility of their "preferred vendors," and the Better Business Bureau confers credibility on those businesses that adhere to their standards of conduct. In such instances, entities establish credibility by leveraging their expertise to approve a resource.

Of course, the effectiveness of *conferred credibility* rests on the referring entity's widely recognized, positive reputation that alleviates users' skepticism. However, if users fail to recognize relationships between sources and recipients of conferrals that might compromise credibility, conferred credibility may be earned falsely. For example, the search engine Google currently provides a number of sponsored links, for which Google has been financially compensated, that appear on each page of search results. Research shows, however, that the majority of users is unaware of the sponsored status of such links and views these resources as equivalent to the remainder of search results shown.[39] In this case, Google has conferred its credibility to the sponsored links, if not intentionally than at least functionally, in light of users' ignorance of the preexisting sponsorship model. Similarly, hyperlinks among blogs and Web pages of similar content might indicate a presumed endorsement when instead the linkage might be based simply on shared topical interest.

Tabulated credibility relies on peer rating of some dimension of an individual, organization, transaction, opinion, or product that is subsequently tallied to provide an omnibus rating score. For example, the online auction site eBay.com relies on its members to rate others with whom they have engaged in a transaction, in order to mitigate the considerable risk involved in such financial transactions by enhancing trust, or the "perception of the degree to which an exchange partner will fulfill the transactional obligations in situations characterized by risk or uncertainty."[40] Several studies have demonstrated that tabulated group-based credibility rating systems such as the one used by eBay are consequential for users: indicators of positive reputation can result in higher bid prices, more bid activity, items that are more likely to sell, and fewer problematic transactions[41] and indicators of negative reputation can result in lower bid prices or fewer bids.[42]

Tabulations may also emerge from individuals who interact with one another indirectly. For example, amazon.com provides not only a venue for users to rate their experiences with products and retailers, but also provides means by which users can assess reviews provided by fellow Amazon users. In this manner, those providing reviews earn a reputation over time as being (non)credible information sources. Importantly, such reputational ratings demonstrate the complexity of the concept of credibility: reputation differs from credibility inasmuch as one can potentially be highly credible, but yet have a negative reputation.

Tabulation procedures can also be fairly complex. The online forum slashdot.org, for instance, provides a sophisticated group-based credibility tool to rate its users, their posts, and content provided by and to members. Especially active and valued members are given "moderator" status, whereby they can edit conversational strands and rate contributions to the forum. Moderators rotate over time and are selected from among good contributors, defined by their "karma," which is assigned based on an assessment of "good" versus "bad" posts to the forum. Although complex, this system appears to be effective among slashdot's approximately 700,000 users. From the user's perspective, the ability to aggregate ratings from known or unknown others widens the range of social input that information consumers can use to judge credibility in a way that was not possible before the appearance of networked digital media.

Reputed credibility is also a form of endorsement that is perpetuated through personal and social networks.[43] A good reputation is a powerful mechanism for persuasion. Individuals may not even be able to recount the origins of their reputational credibility perceptions of various sources, relying on general recollections rather than specific information or on subtle cues conditioned over experience and time. In this manner, information consumers might widely recognize and understand differences between the *New York Times* and *New York Post*, for example, in both their print and online forms. Indeed, studies show evidence that

information seekers rely on reputational cues gleaned from their social networks as a primary means of assessing credibility online.[44] Accordingly, sources strive to construct credibility by establishing a good reputation and perpetuate that reputation through social networks. In addition, there is evidence for "credibility transfer," where "recipients use the credibility of a medium or media product as a (heuristic) indicator for the credibility of a single news story or programme."[45] In this manner, credibility transfer can occur both between different media (e.g., from the *New York Times* printed version to NYTimes.com) and within a medium (e.g., from a credible Web site such as CNN.com to a story residing on that site).

Finally, *emergent credibility* also arises from group and social engagement. Several online venues including wikis, social networking sites, and many other applications now provide vast information repositories created by largely self-coordinating individuals, rather than by a central organization. The result is that credibility can sometimes be an emergent phenomenon that arises from a pool of resources, achieved through a system of open access to all. Emergent credibility is at the core of Lankes's[46] "reliability approach" to credibility and Eysenbach's[47] discussion of "apomediaries" as the new arbiters of credibility, particularly among youth who are at ease with social uses and applications of digital media.[48] Wikipedia.com, the vast online encyclopedia with over one million entries provided entirely by individual users, is a prime example of emergent credibility. Indeed, a direct comparison of the accuracy of science entries in Wikipedia and Encyclopedia Brittanica revealed very few differences.[49] Ultimately, credibility through emergence draws attention to crucial elements of credibility assessment: in such environments, users would be wise to consider issues of bias, source identity, and perspective as they navigate resources provided collectively by multiple interested parties.

Concerns about Credibility and Digital Media

Concerns about the credibility of sources and information certainly pre-date the advent of digital media. The need to teach young people to critically appraise information has long been a part of educational efforts, under various monikers such as literacy training and critical thinking.[50] In many ways, the core skills and issues in this domain are the same today as they were before the recent rise in digital technologies. As argued elsewhere, digital media have not so much changed what skills are needed to evaluate the credibility of information as they have changed the need for people to know how and when to exercise those skills.[51]

Digital media do, however, present new challenges for information consumers, and have in many ways shifted the burden of information evaluation from professional gatekeepers to individual information consumers. Accordingly, several scholars have addressed the question of what *is* new about digital media that makes the need for effective critical evaluation more pressing today.[52] This discussion focuses on why digital media present special problems with regard to credibility and credibility assessment, including the quantity and access of information afforded by digital media technologies, the lack of gatekeepers and quality control standards, source and context ambiguity, convergence of information and media channels, disintermediation, and shifting norms and expectations for information retrieval and processing. These functions are examined next.

Special Circumstances of Digital Media and Credibility

Today, few question the notion that digital, networked media have profoundly changed the information landscape, as well as the means of social interaction. Perhaps the greatest change

is that digital media have provided access to an unprecedented amount of information available for public consumption. Until recently, the enormous cost and complexity involved in producing and disseminating information limited the number of information providers, who generally had substantial financial investment in the media apparatus.[53] Network and digitization technologies, however, have lowered the cost of information production and dissemination, thus increasing the sheer amount of information available. Indeed, the adage "On the Internet, anyone can be an author" is largely true, barring, of course, a few well-known caveats about cost and access to technology.

The combination of the vast quantity of and accessibility to digitally stored and transmitted information has prompted concerns about its credibility because, as Rieh and Danielson[54] argue, this combination creates greater uncertainty regarding both who is responsible for information and, consequently, whether it can be believed. Two important and related issues are the nature of gatekeeping in the digital media environment and the level of ambiguity surrounding both the source and context of information.

Several scholars have pointed out that information posted on the Web may not be subject to filtering through professional gatekeepers and, as a result, digital information may be more prone to being poorly organized, out of date, incomplete, or inaccurate.[55] Others have noted that digital media sometimes lack traditional authority indicators such as author identity or established reputation.[56]

Indeed, source information is crucial to credibility because it is the primary basis on which credibility judgments are thought to rest. At the same time, however, "source" has become muddled as media shifted from analog to digital forms.[57] There are several ways in which the source of information is problematic in the digital media environment. In some cases, source information is unavailable, masked, or entirely missing from a Web site, chat group, blog, wiki, and so on. In other cases, source information is provided, yet hard to interpret, such as when information is coproduced; re-purposed from one site, channel, or application to another; or when information aggregators display information from multiple sources in a centralized location that may itself be perceived as the source. These technological features create a kind of "context deficit" for digital information.[58] Moreover, the hyperlinked structure of the Web contributes to this deficit by making it psychologically challenging for users to follow and evaluate various sources as they move from site to site. Research by Eysenbach and Kohler,[59] for example, showed that source and message information become confused or disassociated in users' minds almost immediately after performing searches for medical information online.

Concerns about credibility within the digital media environment also stem from the fact that there are few standards for quality control and evaluation. There are no universal standards for posting information online, and digital information may be easily altered, plagiarized, misrepresented, or created anonymously under false pretenses. The malleability and dynamic nature of digital information exacerbate potential problems of information reliability, given that the alteration of digital information is difficult—if not impossible—to detect. In addition, the global nature of the Web makes it challenging to enact standards for quality control in the form of government regulation.[60] Finally, there is greater ambiguity about how to evaluate digital information owing simply to the relative newness of these channels of information that, in turn, makes the lack of standards for information presentation and evaluation more significant in comparison to traditional media.[61]

Another reason that the credibility of digital information may be suspect relative to more traditional media is due to channel convergence and conflation of content types afforded

by digital technologies. Some have suggested that visual and other types of distinctions that were once clear between, for example, information and commercial content are not so easily distinguished in the digital environment.[62] Examples include sponsored and unsponsored links on search engine result pages and ads embedded in Web page content. Indeed, Burbules[63] has suggested that because information is presented in a similar format on Web sites, a psychological "leveling effect" is created that puts all information on the same level of accessibility and, thus, all sources on the same level of credibility.

In the extreme, "spam" messages (unsolicited or inappropriate messages often used for mass commercial advertising) create instances where individuals lack knowledge of the sender, although peripheral cues can serve to inform credibility evaluations. Less obvious, however, are other hybrid e-mail forms. "Phishing" techniques (e-mail messages from presumably known sources that are designed to entice individuals to visit fraudulent Web sites) are designed to appear credible in order to elicit individuals to provide personal data such as bank account information, and have been shown to be very effective, in spite of widespread knowledge of such techniques.[64] In addition, as "viral" e-mails are forwarded from one person to another, the content of the message can sometimes be so thoroughly divorced from its source as to make evaluation nearly impossible. Interestingly, spam, phishing, and viral e-mails can be viewed as attempts to construct credibility by capitalizing on users' perceptions of the credibility of the e-mail medium, which is derived in large part by its highly personal nature, as most e-mail communication takes place between parties known to one another.

Finally, digital media prompt increased concern about credibility by elevating the negative consequences of misinformation for consumers. As part of their efforts to economize, organizations are migrating more and more critical information to the Web, or making such information accessible exclusively via digital means.[65] Digital media have thus enhanced both capabilities and expectations for people to be more self-serving and self-informing. Individuals are now encouraged or expected to do everything from choose between medical treatment options, decide on retirement benefits and investment options, book airline reservations, and select and register for college courses entirely on their own, using information provided via digital media rather than interacting with live agents, experts, or customer service representatives. This trend toward "disintermediation" enabled by digital media raises the stakes for consumers to be able to locate and discern credible information online.[66]

Overall, while it is true that these characteristics and realities of digital media may not have changed the basic skills needed for credibility assessment, they certainly have changed the *need* to assess credibility, the *frequency* with which to do so, and the *strategies* that may be useful and available to assess information and its source. As Burbules[67] notes, "conventional methods for assessing credibility may not be feasible on the Web because of its speed, complex features and link structure, and lack of referencing and organizational conventions."[68]

Youth, Credibility, and Digital Media

Digital media present special credibility issues for youth. To date, however, the vast majority of research on credibility has focused on news, health/medical, and commercial information, which are often assumed to be "adult" topics, or at least topics that are of more interest to adults. Consequently, extremely little research has focused on credibility and youth, in spite of the fact that youth are avid information seekers across many domains of information, whether for class assignments or personal use.[69] It may be the case, however, that youth seek different *types* of information using digital media than do adults. For example, Eysenbach[70]

points out that while adults often seek medical information about treatments or disease, youth are more likely to seek information on health (e.g., fitness, dieting) or sexuality.

The credibility of information obtained via digital media is important for youth, however, not only because they are active information seekers but also because there are some key differences between youth and adult information seekers in general, and specifically in their information-seeking goals. Compared with adults, for example, youth tend to be relatively heavily immersed in digital media by virtue of growing up in an environment saturated with these tools.[71] There is also evidence that youth access an equal or greater proportion of information via digital media than do adults, suggesting that they may find using these tools to locate information more natural compared with adults.[72]

Indeed, librarians and educators around the country have commented on a significant decline of (physical) library patronage since the appearance of the Internet and searchable databases.[73] Martell documents these trends with statistics across various university libraries, showing corresponding declines in physical library usage with increases in remote, virtual usage.[74] Beyond locating information for academic purposes, youth also rely heavily on digital media for other informational purposes on a daily basis, using a wide array of digital media technologies such as social networking Web sites, chat groups, interactive games, cellular telephones, e-mail, and text messaging to do so.[75]

Such heavy reliance on digital media could also be a consequence of the fact that youth may perceive greater social pressures to use digital media in ways consistent with their peers than do adults. Recent studies demonstrate that social and group-based applications of digital media, such as social networking sites, are extremely popular among young people,[76] and youth may feel greater desire and opportunity to expand their social connections and locate opinion leaders via these media, thus perhaps taking better advantage of opportunities for "emergent credibility" construction and assessment, as discussed earlier. At the same time, however, youth may also perceive less risk of disclosing personal information while using these applications, because they might think of themselves as having less financial and identity consequences at risk than adults. This presents complex credibility issues with regard to discerning the trustworthiness of some person with whom one is interacting via these media that are not unique to youth, but could be more pressing and widespread for this population.

Children's relative lack of life experience as compared to adults may also put them at greater risk for falsely accepting a source's self-asserted credibility, since such assessments are based on accumulated personal experience, knowledge, reputation, and examination of competing resources. As a group, youth have fewer life experiences to which they might compare information than do most adults. In addition, youth may not have the same level of experience with or knowledge about media institutions, which might make it difficult for them to understand differences in editorial standards across various media channels and outlets compared with adults who grew up in a world with fewer channels and less media convergence. As a consequence, some youth may not have the same level of skepticism toward digital media as adults do, because these media are not seen as "new" to younger users who cannot remember a time without them.

Specific instantiations of digital media technology may also pose particular credibility challenges for children, who possess less knowledge, experience, and skepticism than adults. E-mail serves as a good example. In the case of spam, younger children in particular might blindly transfer their perceptions of e-mail as a personal, credible medium and therefore not fully appreciate the sender's commercial intent. Similarly, children may not have sufficient

knowledge to be appropriately skeptical of phishing techniques or viral e-mail messages that make it difficult to determine the true message source and purpose. Also, differences in life experience may affect youth's ability to appropriately understand newer forms of credibility construction and assessment discussed earlier. Specifically, both "reputed" and "conferred" credibility rest on users' familiarity with the reputation of a particular source or conferring agent, a familiarity that many children may not possess. Furthermore, it may be difficult for children to grasp the often complex relationships between sources and recipients of credibility conferrals, such as the meaning of "sponsored links" in a Google search result page.

Beyond experiential differences, children differ from adults in their cognitive development. As described by Eastin,[77] there are clear differences between children and adults, and between younger and older children, in cognitive skill acquisition that may have important credibility implications. Youth, particularly younger children, may be more susceptible to digital misinformation and less able to discern credible from *non*credible sources and information than are adults who are more cognitively advanced. Evidence shows that young children have a hard time distinguishing commercial from noncommercial information within the broadcast medium,[78] a task that can only be more difficult given trends toward channel convergence and conflation of types of information in the digital media environment discussed earlier. Other credibility "aids" that may be effective for adults may be ineffective for children who have not reached cognitive maturity. For example, a popular tool to help people negotiate unfamiliar territory online is ratings and recommender systems. The intricacies of such systems might be too difficult for younger children to grasp since these systems can actually be quite complex. To take full advantage of ratings systems, for example, users must weigh knowledge about the quality and quantity of raters, the context in which ratings are proffered, and the specific tabulation system in place. This suggests that the advantages offered by "tabulated credibility" may be lost on younger digital media users.

Differences in reliance, motivation for and patterns of use, experience, and development notwithstanding, both children and adults face serious consequences of receiving unreliable information from digital media sources. These consequences may, however, be somewhat different for the two user populations. For adults, the financial or health ramifications of making decisions based on bad or outdated information may be of primary concern, whereas for children the consequences of misinformation may be more apparent in other realms, such as in learning or physical safety. Learning and, by extension, grades are crucial concerns for youth, given their importance as determinants of opportunities later in life. Ongoing news reports of kidnappings and assault highlight the importance of children's ability to assess whether those to whom they disclose personal information via digital media really are who they claim to be. In each case, the cost of assessing credibility inaccurately is highly consequential for youth.

Although differences in experience and cognitive development suggest that there are substantial challenges for youth to assess the credibility of digital sources and information, it is simplistic to conclude that youth are inherently disadvantaged compared with adults when it comes to credibility assessment. These characteristics of youth audiences present both challenges and opportunities. On the one hand, youth may be a particularly vulnerable audience because of their special characteristics. On the other hand, forms of credibility assessment that rely on information to be spread efficiently through social networks (e.g., emergent credibility) highlight some intriguing advantages for youth populations, who are often extremely interconnected compared to adults. In such instances, younger users may actually be better equipped than adults to transmit information pertaining to an entity's credibility quickly and efficiently via their social networks.[79]

What *is* safe to conclude is that youth's high degree of immersion, coupled with areas of naïveté, differences in cognitive development, and usage of digital media elevate the importance of understanding credibility within this user population. A primary purpose of this volume is, thus, a call to arms to researchers, educators, policy makers, and others concerned with these issues to understand how youth think about credibility in the digital media environment and to devise a plan to assist youth in finding and evaluating the information that they need.

Perspectives on Credibility from Scholars, Educators, and Youth

Scholars, educators, and youth bring different perspectives about digital media and youth, each informed by different concerns and foci. Collectively, these views combine to shed light on a number of relevant issues; yet, it is worthwhile to examine each of these voices singly as well.[80]

Scholars

Many intellectuals point out that digital media have changed not only people's access to information but also the ways in which we appraise information. Traditional notions of credibility as coming from a centralized authority (e.g., a teacher, expert, or author) and individualized appraisal processes are challenged by digital technologies.[81] Electronic networks make it easier to rely on the collective to assess information. Credibility assessments constructed through collective or community efforts (e.g., wikis, text messaging via cell phones, or social networking applications) emerge as a major theme in recent discussions, and phrases like "distributed" and "decentralized" credibility, the "democratization of information," and "collectively versus institutionally derived credibility" are common. At core is the belief that digital media allow for the uncoupling of credibility and authority in a way never before possible. Digital media thus call into question our conceptions of authority as centralized, impenetrable, and singularly accurate and move information consumers from a model of single authority based on hierarchy to a model of multiple authorities based on networks of peers.

For some, this change is scary while for others it is liberating. Indeed, there are two opposing reactions to the dangers posed by noncredible digital information. One reaction calls for "protectionist measures" involving censorship and restricted access to online information (e.g., filters or restrictive policies), which necessarily rely on systems of hierarchy and authority (e.g., portals and professional vetting of sites). For others, this shift is positive and is seen as the "solution" to the credibility "problem." This view advocates allowing *greater* openness and freedom of information and is evocative of John Milton's First Amendment principle that the best way to counter bad speech is to allow more speech. In this view, all perspectives should be allowed into the marketplace of ideas and, through that process, "bad" (i.e., noncredible) ideas will ultimately be discredited and discarded.[82]

It is interesting that both views are evident in discussions of digital media and credibility. Educational efforts have more often taken the protectionist approach, and have opted for forms of censorship to shield students from potentially "bad" information online. Others argue that censorship and filtering hamper students' ability to learn to think critically about the information they receive via digital media,[83] and that collaborative filtering processes made possible by digital networked technologies will solve many of the credibility problems raised by digital technologies, as everything will be subject to unprecedented levels of peer review via digital networks.

Educators

The notion that digital media are challenging our fundamental ideas about learning and education is prevalent among teachers and librarians. Specifically, many educators argue that digital, networked media provide new opportunities for students to learn from others in a much less hierarchical and institutional way than ever before. Some go so far as to suggest that schools and teachers are no longer needed since digital media enable students to access and learn from the collective experience and intelligence of peers or communities. Of course, this type of self-directed learning carries with it a greater burden for students to critically evaluate information from these sources. The urgency with which educators speak of digital literacy is exacerbated by their feeling that digital media have changed youths' expectations about information. They say that today, young people expect information to be available at any time, instantly. Many educators feel this places greater burden on students to evaluate the information they get online, presumably because they are processing more information more quickly, and because source identity may be harder to discern online.

Some educators feel strongly that learning to assess the credibility of digital media and information requires students to participate in the online communities from which they seek information. Others feel that a critical component of digital literacy requires kids to learn credibility assessment through digital media production, thereby teaching kids to be "architects of credibility." In other words, many feel that youth need to be taught how to be "prosumers" (i.e., both producers and consumers) of digital media as a starting point for learning credibility assessment.

Another, related theme is that educators need to find ways to support what kids are naturally doing with digital media and to leverage that into opportunities to teach critical thinking. This likely involves developing new models for teaching and learning, but a problem is that most schools cast a wary eye on incorporating new forms of digital media into the curriculum. One example is that most of youths' favorite applications and uses of digital media, including social networking applications, e-mail, cell phones, and e-commerce, are banned in schools. In fact, most school policy toward digital media, as well as most media literacy curricula, is based on the assumption that children are in need of protection from vast amounts of misinformation online and other dangers lurking on the Web.[84]

Youth

In contrast to the other stakeholders, youth themselves do not seem to be terribly concerned about credibility. What few empirical studies exist find that credibility is not a primary concern to young people when using digital media,[85] although two dimensions of minor apprehension have emerged. First, youth report that they are concerned about the reliability/accuracy of information that they find and use in their schoolwork (i.e., information or message credibility). Second, youth say that they are concerned about trusting people they may meet in the virtual world. Neither of these concerns is surprising, given that academic and social motivations prompt a good proportion of young people's use of digital media. As for solutions to the credibility "problem," many youth indicate that it is up to each individual to use caution and take the necessary steps of cross-validation and background research to verify digital sources and information. Whether they will rise to that challenge in every situation is both unknown and unlikely.[86]

Perhaps the most consistent theme across all these stakeholders is that digital technologies complicate traditional notions of hierarchy and authority structures. The digital media environment offers unprecedented flexibility, allowing kids to have more authority than

adults in some realms on some topics, nonexperts to be more credible than experts in certain circumstances, and unknown individuals to sometimes be more believable than the national news media. Many believe that digital media are shattering traditional models of authority and, as a result, credibility is being turned on its head. This upheaval suggests both problems and opportunities that require going beyond polemics in thinking about these issues.

Conclusions and Directions for Future Inquiry

Theoretical development provides researchers and practitioners a better understanding of the processes of credibility assessment that, in turn, aids them in devising strategies to help people become better information consumers. Although research on credibility and digital media to date has often neglected theory construction,[87] important theoretical applications and developments are currently emerging, many of which are represented in this volume. In particular, researchers are beginning to recognize the role of context and motivation in information searches and to incorporate this into models of credibility assessment.[88] In this regard, the application of dual processing theories, such as the Elaboration Likelihood Model or the Heuristic-Systematic Processing Model,[89] is particularly promising since these theories can help explain differences in credibility assessment processes across a variety of information-seeking contexts and situations.

With regard to youth specifically, theories of human development offer insight into the special problems that young people of varying ages may face when assessing the credibility of sources or information in the contemporary media environment. Eastin,[90] for instance, notes the cognitive developmental limitations that potentially inhibit youth of various ages from discerning information source, intent, and therefore credibility appropriately. In this area, the interdisciplinary nature of credibility research offers particularly exciting opportunities for innovative theoretical developments.

Credibility assessment research is also starting to profit from information-processing theories, such as the Limited Capacity Model and others, that help to understand how people evaluate and make decisions based on information they obtain from digital media.[91] Rieh and Hilligoss,[92] for example, propose that individuals make predictive evaluations of the usefulness of information sources and information-seeking strategies based on their own experiences and refine these assessments over time. In this manner, people learn to reuse or avoid information sources based on their verification of them. Similar to Sundar's[93] observation that individuals heavily invoke cognitive heuristics in their credibility assessments, rather than more laborious information-processing activities, such strategies result in increased predictability and reduced cognitive effort. In contrast to cognitive heuristics, however, predictive/evaluative strategies rely primarily on explicit and articulated social outcomes, as opposed to largely implicit evaluations of technical features and inferred social cues formed over time and experience. To gain the greatest benefit from information-processing models, future work should combine both of these perspectives.

Eysenbach similarly argues that people's evaluative strategies evolve with experience.[94] He proposes an iterative view of technology usage for credibility assessment whereby people shift from relying on information "intermediaries" (sources that stand between information consumers and pertinent information or services, such as librarians or doctors) to using "apomediaries" (sources that mediate without standing in between consumers and pertinent information or services, such as collaborative filtering via peers or technical tools) as they gain knowledge and self-efficacy. To have the greatest traction, the specific circumstances

under which apomediation might occur will need to be articulated and validated. Moreover, as suggested by this view, the role of various group processes needs to be more fully expressed in credibility research as well. As it stands, most research focuses on the cognitive processes of individuals acting alone (although with tacit awareness of others) to assess the credibility of information they get via digital media. To better reflect how people are increasingly using digital media, the explicitly social, networked circumstances of credibility assessment need to be addressed.

Nonetheless, experience with digital tools appears to be a necessary, although not sufficient, condition to take full and appropriate advantage of the many sources of information accessed via digital media. For instance, the nearly automatic heuristic judgments learned through interaction with digital media are honed through experience;[95] accumulated experience can result in reliable information search results across various media;[96] and Internet experience has been shown by some to be positively related to assessments of the credibility of Web-based information and to verification behaviors.[97] Experience, however, should not be confounded with expertise, nor should experience with Web technologies be equated to life experiences. Each is consequential in its own way for youth determining the credibility of online sources and information. For instance, technological experience alone does not enable individuals to discern credible from noncredible information (although it can help),[98] nor can those without sufficient life experiences make sense of certain information dilemmas they may confront online. As Eastin[99] argues, youth are faced with rather complex cognitive tasks online, and youth at different developmental stages are equipped to different degrees to resolve these dilemmas effectively. Nonetheless, youth may enjoy certain advantages due to their relative immersion in digital media, which might not yet be readily apparent. This, of course, suggests a wealth of possibilities with regard to our understanding of credibility assessment that can only be understood as data are collected over long periods of time. Indeed, as noted earlier, we have only begun to explore what "growing up digital" means for media users who will be immersed in digital media for their entire lives.

From a practical standpoint, understanding the processes of credibility assessment among youth is critical. Credibility is a cornerstone of people's interactions, personal representation, academic and professional performance, and democratic expression and choice. As more delivery mechanisms become available, more information content migrates online, and more of the world's population is interconnected, it is crucial that individuals understand the implications of their media environment and learn to assess credibility in ways appropriate to their situational demands. This is especially significant for youth, who are uniquely and simultaneously advantaged and disadvantaged by their relation to contemporary media technologies.

Teaching youth about credibility assessment, then, must both make use of their existing knowledge of contemporary technologies and address their outstanding deficiencies. As Rainie[100] argues, research and learning among youth are increasingly self-directed, interactive with networks of peers, and reliant on group outreach and knowledge. Consequently, opportunities that use the lessons inherent in the tools that already engage youth offer strategies for teaching critical distinctions that may result in appropriate digital media literacy.[101] For example, showing students existing Web sites whose focus is to reveal published misinformation, prompting youth to examine Wikipedia's "talk pages" where collaborators discuss contested encyclopedia entries, encouraging youth to become information providers themselves, and using direct comparisons of competing news accounts all present means by which digital tools and resources can be leveraged to illustrate credibility assessment concerns and

strategies.[102] These methods offer opportunities for demonstrating core credibility issues by invoking real-time and real-world instances of contested content and behaviors, via the media technologies and tools that youth naturally enjoy using. In this manner, even "managed" environments like schools can take advantage of so-called autonomous, informal learning environments and opportunities found online, which may themselves be more credible to youth.[103]

Nonetheless, in the end such strategies must overcome the "structural" challenges that are built into the political and cultural schooling environment.[104] In addition, issues of credibility and new media are subject to a range of supportive to restrictive sociopolitical interventions[105] that can alter their form and effectiveness. Ultimately, the relation among youth, digital media, and credibility today is sufficiently complex to resist simple explanations. This volume represents a first step toward mapping that complexity and providing a basis for future work that seeks to find explanations that will ultimately help scholars, educators, policy makers, and youth take advantage of the new opportunities for empowerment and learning offered by digital networked media.

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78. See ibid.

79. See Lankes, this volume, and Eysenbach, this volume, for similar arguments.

80. The following section was informed by online dialogues with researchers, educators, and interested members of the public, as well as by youth participants in the Global Kids Digital Media Essay Contest. Over thirty people participated in the online dialogues, which were held in the fall of 2006 and were sponsored by the MacArthur Foundation as part of the Digital Media and Learning initiative. Excerpts of the online discussions may be found at http://spotlight.macfound.org/main/category/c/Credibility/. For information about the Global Kids Digital Media Essay Contest, including the winning essays, see http://www.globalkids.org/.

81. See Lankes, this volume.

82. See Weingarten, this volume, for a similar discussion with regard to policy.

83. See Harris, this volume.

84. See ibid., for a full discussion of these educational issues.

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89. See Sundar and Eysenbach chapters, this volume.

90. Eastin, this volume.

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92. Rieh and Hilligoss, College Students' Credibility Judgments, this volume.

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101. Harris, Challenges to Teaching Credibility Assessment in Contemporary Schooling.

102. H. Jenkins, Confronting the Challenges of Participatory Culture: Media Education for the 21st Century (white paper produced for the MacArthur Foundation's Digital Media and Learning initiative, November 13, 2006), http://www.digitallearning.macfound.org (retrieved November 14, 2006).

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