

# Health Information, Credibility, Homophily, and Influence via the Internet: Web Sites Versus Discussion Groups

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Despite concerns about online health information and efforts to improve its credibility, how users evaluate and utilize such information presented in Web sites and online discussion groups may involve different evaluative mechanisms. This study examined credibility and homophily as two underlying mechanisms for social influence with regard to online health information. An original experiment detected that homophily grounded credibility perceptions and drove the persuasive process in both Web sites and online discussion groups. The more homophilous an online health information stimulus was perceived as being, the more likely people were to adopt the advice offered in that particular piece of information.

The diffusion of the Internet provides easier and greater access to health and medical information than ever before. At least 95 million people have searched at least 1 of 16 major health topics online (Pew Internet & American Life Project, 2005). Although new technology offers promise for health and support, it raises problems and concerns as well. Experts and lay users share concerns about individuals being misled by inaccurate online information; approximately 86% of online health information users are concerned about the veracity of information on the Internet (Pew Internet & American Life Project, 2000). The 2005

Pew survey shows that among Internet users not specifically using health information, more than a third agree that “much of the information on Internet cannot be trusted.” Medical associations and information experts deride the lack of editorial control as providing the potential for unqualified, biased, and incorrect medical advice to appear online. Indeed, incomplete and inaccurate online information has been documented regarding a variety of ailments (Craigie, Loader, Burrows, & Muncer, 2002; Impicciatore, Pandolfini, Casella, & Bonati, 1997).

Concern over the credibility of health and medical information online includes, but is not limited to, the World Wide Web (WWW). In addition to the Web, hundreds of thousands of individuals exchange information and social support through sanctioned or informally organized online

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peer discussions (see Preece & Ghozati, 2000). Using Usenet, bulletin boards, or other such venues informally (see Harris, 2006), or on institutionally-based, purposive support lists (see e.g., Gustafson et al., 2001), participants appear most often to be patients, prospective or former patients, or their relatives and caregivers. Their advice is most often based on their firsthand experience with illness, treatment, and recovery rather than through formal credentials. It is these discussions that cause the greatest concern for health professionals. Their credibility mechanisms are less understood, although some research has assessed credibility in these settings descriptively (Wright, 2000b) or rhetorically (Galegher, Sproull, & Kiesler, 1998). Web sites, in contrast, are more likely to feature information from supposed experts rather than lay participants. Due to these limitations, health information on the Internet is generally disfavored by information evaluators, who are usually health professionals (Weis et al., 2003), even though it is welcomed by many patients.

Despite this concern about what and whom to trust in both Web sites and discussion groups, very little is actually known about how end-users of online health and medical information evaluate the credibility and utility of such information. This study explores credibility mechanisms through their influence on users, and examines how credibility operates in two channels: Web sites and online discussion groups. Specifically, we look at whether the expert advice of Web sites or the peer advice of discussion groups carries more weight with users and for what kinds of information. In the following, we briefly review the constructs of credibility and homophily, the application of credibility constructs to Internet information variations, and new factors that Internet channels introduce that may affect credibility assessments. The study culminates in an empirical examination of Web-based information and discussion-based information in terms of their credibility, homophily, and influence on users.

## CREDIBILITY

Credibility pertains to the believability of a source. A major theoretical issue that drives this research stems from early assessments of credibility's primary dimensions: *expertise* (a communicator's qualifications and/or ability to know the truth about a topic) and *trustworthiness* (perceptions of the communicator's motivation to tell the truth about a topic; Hovland, Janis, & Kelley, 1953). Apart from the potential that a source might have a self-interested motive to deceive the receiver, trustworthiness is often linked to the perceived similarity between a source and the receivers. These two components of source credibility may present a tension with regard to sources of health information online: One construct may favor Web sites based on the credence of the expertise claims, whereas the other

favors peer discussions based on the trustworthiness of similar participants.

## Receiver Characteristics

When receivers are more concerned with the topic, they are less prone to variations in source characteristics (Benoit, 1987; O'Keefe, 1990). Recipients turn to message cues to make credibility judgments when information about the source is scarce (Eastin, 2001; Petty & Cacioppo, 1986) with respect to Internet health information as well as in other domains (Dutta-Bergman, 2003). Indeed, compared to those seeking finance, travel, or e-commerce information, perusers of health information were more attentive to information/content than Web site features in their rating of Web site credibility (Stanford, Tauber, Fogg, & Marable, 2002). Thus, superficial variations otherwise leading to differences in apparent source credibility may be less influential for serious health information seekers. At the very least, it is important for research on health information to employ participants of the age for which the content is potentially relevant. People also attribute different levels of credibility to different media. For instance, television is higher in perceived believability than print media, whereas newspapers are more credible than magazines and other print media (Flanagin & Metzger, 2000).

## Homophily

Homophily is the degree of perceived similarity a receiver ascribes to a message source. Homophily affects persuasion and perceptions of otherwise unknown individuals, both offline (McCroskey, Richmond, & Daly, 1975; Wheelless, 1974) and online (Walther, Slovacek, & Tidwell, 2001). Following this notion, we raise the possibility that the heterophily connoted for most users by a source with great medical expertise may compete with the homophily one may experience through interactive or observational communication with peers in discussion groups. Whether Internet users relate to peers differently than experts may have a large impact on message assessments, which suggests that homophily, as well as credibility, are important constructs in assessing the impact of online health information.

## HEALTH INFORMATION AND THE INTERNET

### Web Site Credibility

Research pertaining to how users seek and evaluate health-related information credibility on the WWW is a growing area. There are persistent concerns about whether Web-based health information masks conflicts of interest when a Web site provides information on diseases treated

by the products and services sold on that site, and offers unbalanced views of medical issues (Sonnenberg, 1997). The specific Internet domain (.com, .org., .edu, .gov) on which online health information appears also interacts with the presence or absence of advertising to affect credibility judgments: The most credible combinations involve a .org site with no advertising, followed closely by a .com site featuring advertising (Walther, Wang, & Loh, 2004). Despite the newness of this topic, key findings and summaries can be found elsewhere, which mitigates the need for an elaborate review in this article (see, e.g., Dutta-Bergman, 2003; Eysenbach & Köhler, 2002; Metzger, Flanagin, Eyal, Lemus, & McCann, 2003; Fogg et al., 2001; Walther, Pingree, Hawkins, & Buller, 2005). In their comprehensive review of the topic, Metzger and colleagues' (2003) conclusions reinforce the notion that Web sites attempt to influence readers through credibility presentations: Web site expertise is affected by the site's informativeness, the display of the appropriate credentials, and/or the type and reputation of the site sponsor. We thus offer the hypothesis,

- H1: For health information on Web sites, credibility is positively associated with the (a) evaluation and (b) influence of that information.

### Online Social Support Groups

Although there is an abundance of health-related information on the Web, health information seekers (at least for cancer) appear to turn to electronic peer support groups to a greater extent than to Web sites for information (Scheiber & Gründel, 2000). Of the estimated 95 million people who searched for health information on the Internet (Pew Internet & American Life Project, 2005), 45% used online support groups in a variety of ways, such as bulletin boards, chat rooms, list serves, and individual e-mail exchanges for health and other forms of social support. The hyperpersonal model of CMC (Computer-mediated communication; Walther, 1996) helps to explain the power and allure of sharing information interactively with relative strangers online. When CMC users detect similarity with online partners, they may idealize these individuals, and through editing and selectively presenting their own responses online, come to experience unusually intimate reactions to online partners. Moreover, CMC's lack of physical cues online tends to facilitate greater self-disclosure than face-to-face interaction (Tidwell & Walther, 2002). Extending this framework, Turner, Grube, and Myers (2001) analyzed the relative attraction to offline and online support sources, and the contingencies under which each may provide an optimal match to the support seeker's needs. When offline acquaintances lack the expertise or empathy needed by an individual, the patient may turn to online sources and thence form exceptional relationships to an online group and/or the individuals within it. Thus,

hyperpersonal dynamics may begin to account for exaggerated perceptions of similarity and deep involvement with online support groups, strengthening the role of similarity/trustworthiness as a basis of social influence in these settings.

Online social support groups take several forms, but the oldest and most widely used are the hundreds or thousands of groups that traverse Usenet News, a worldwide network of topical discussions. Usenet support groups range in topic from social situations (e.g., alt.support.divorce) to groups devoted to discussing childhood sexual abuse, HIV, arthritis, depression, cancer, and other topics. Discussions range from legal and pharmacological questions and answers, to coping and emotional advice. These discussions can include a surprising level of disclosure, with participants often baring their souls in very intimate narratives (Broom, 2005).

Online support groups have several advantages over traditional face-to-face support: reduced time and geographical proximity constraints on access to support providers (Mickelson, 1997; Weinberg, Schmale, Uken, & Wessel, 1995), more diverse sources of health information (Rice & Katz, 2001), low cost (Winzelberg, 1997), and the manner in which anonymity reduces the embarrassment associated with some health issues, which encourages more discussion (Broom, 2005). Shy members can also benefit by lurking online (Winzelberg, 1997). Walther and Boyd (2002) analyzed users' attraction to such systems, drawing on sociological notions of weak-tie networks and the hyperpersonal communication model's notions of selective and deliberative interaction via computer-mediated communication. The four main attractors to online support groups included social distance (weak-tie expertise and the relative reduction of obligation), anonymity and stigma control, conversation management, and access.

Overall, many researchers have documented a considerable number of positive findings from online support in different settings (e.g., Brennan, Moore, & Smyth, 1991, 1995; Finn & Lavitt, 1994; Gleason, 1995; King, 1994; Schneider, Walter, & O'Donnell, 1990; Weinberg et al., 1995). Yet despite of the promise of online support groups, in contrast to the better-studied WWW, "little is known about the functioning and efficacy of these groups" (Winzelberg, 1997, p. 393) or their impact on overall levels of social support (Eastin & LaRose, 2005, p. 977). Research on online support groups is characterized as descriptive and lacking theoretical frameworks (Wright & Bell, 2003). Only a few studies have specifically examined the content of the online discourse (e.g., Braithwaite, Waldron, & Finn, 1999; Loader, Muncer, Burrows, Pleace, & Nettleton, 2002; Shaw, Hawkins, Arora, et al., 2006; Shaw, Hawkins, McTavish, Pingree, & Gustafson, 2006; Shaw, McTavish, Hawkins, Gustafson, & Pingree, 2000; Winzelberg, 1997; Wright, 2000a, 2000b, 2002).

Content-analytic studies suggest that two major types of health information are exchanged in these groups: medical information and personal support. Preece and Ghazati

(1998) studied a bulletin board about people's concern over torn anterior cruciate ligaments and found that empathic communication is more important than the factual information give-and-take in that case. Weis and colleagues' (2003) study of MSWatch.com (a Web site and peer-to-peer discussion forum for multiple sclerosis patients) showed that online support group members tend to "make use of both its health-care information (care) and support (caring) functions" and tend to "evaluate the Web site more highly overall if they make use of both information and support" (p. 135). According to Weis et al. (2003), *care* is "information related to treatment of the patient's physical condition," and *caring* is "provision for the patient's socio-emotional well being" (p. 137). They further argue that this distinction has a communication parallel, that is, the distinction between information communication (e.g., treatment options) and support communication that helps build relationships between people.

*Credibility issues in online support groups.* In online support groups, due to the asynchronous and ephemeral nature of such groups, the correction of inaccurate information by oneself or by others may be significantly delayed, and missed by many members. As Winzelberg (1997, p. 405) found in online support groups, "almost 12% of the information provided was inaccurate and outside the standards of medical and psychological care," and "corrections often occurred 1–2 weeks after the original postings."

Few studies have attempted to analyze credibility in online support settings. One that has done so is a discourse analysis conducted by Galegher et al. (1998). These researchers discerned that legitimacy and authority were the two most important factors in establishing credibility in electronic groups. *Legitimacy* (a.k.a. "entitlement"; Paisley, 2001) involves the participant's demonstration that his or her concern is genuine and justified, and thus worthy of attention. Legitimacy prompts support and information from others in the electronic group. *Authority* draws on tacit claims to the appropriateness, relevancy, or sufficiency of the content participants share (Galegher et al., 1998; Liu, 1997). Galegher et al. (1998) found that participants often referred to medical or scientific research in their messages as a means to establish authority. Although scientific reference is more likely to be perceived as appropriate and relevant, it is not necessarily sufficient. Answers based on personal experience are conceived as more relevant to readers but are not sufficient when taken in isolation.

*Homophily in online support.* How homophily is detected and ascribed online is a contentious issue. On computer networks, according to some theories and commonplace assumptions about computer-mediated communication, homophily might be hard to detect: "As a result of limited nonverbal cues in on-line environments, individuals may find it difficult to assess similarity" (Wright, 2000b, p. 48). However, according to the social identity/deindividuation

theory of computer-mediated communication (Lea & Spears, 1992), it is the social identity, or social similarity of online communicators with a salient group reference, that drives identification and relating in online interaction.

Wright and Bell (2003) claimed that online support groups "facilitate participant similarity and empathic support" (2003, p. 39). Their viewpoint was echoed by Preece (1999), who found that people with similar backgrounds or similar health experiences (e.g., illness, addiction, or disability) exhibit more empathy toward each other. Likewise, in a comparison of demographically homogeneous versus heterogeneous online support groups concerning Parkinson's disease, Lieberman, Wizlenberg, Golant, and Di Minno (2005) found that members of homogeneous groups were significantly more attracted and committed to their groups, reported higher cohesiveness and satisfaction, showed greater positive changes, and derived greater benefit from their group participation.

The perceptions of support providers and recipients in the context in which support takes place has been identified as one of the intervening variables that affect the link between social support and health outcomes (Barbee, 1990; Choi, 1996; Edwards & Noller, 1998; Wright & Bell, 2003). People are motivated to seek online support from others who might have similar health problems or experience (Braithwaite et al., 1999; Wright, 2000a, 2000b; Wright & Bell, 2003). Peer-to-peer discussion with similar others could help people reduce isolation, which cannot be fulfilled by consulting professionals or experts (Wright, 2000b). The insight that peers provide through online support groups is often considered to be unique and personal (Wright & Bell, 2003). As Preece (1999) put it: "Physicians can provide the facts, but other patients can tell you what it really feels like and what to expect next, in a way that only someone with personal experience can" (p. 63). Preece (1999) also noted that not many health-care providers are involved in online support groups; most of the online discussions occur between people who share similar health problems, and a sense of community is important to their members. Based on the preceding,

H2: For health information on discussion groups, homophily is positively associated with the (a) evaluation and (b) influence of that information.

This research also concerned itself with the potential interplay between homophily and credibility. Previous research shows that the relationship between the information recipient and the source affects the degree of credibility accorded to the source (Aune & Kikuchi, 1993; O'Keefe, 1990). Wright and Bell (2003) argued that "due to greater similarity, it is possible that people in computer-mediated support groups are better than other sources at conveying empathy, and they are ultimately better able to provide emotional support" (p. 49). Wright (2000b) examined credibility, homophily, support, and satisfaction with online social

support groups. Findings indicated strong relationships between support satisfaction and the character and competence dimensions of credibility. Attitude homophily correlated with support satisfaction, credibility, and background homophily. These descriptive studies portend strongly for the potential persuasive effectiveness of online discussion groups. Their effectiveness in health communication may be partly attributable to users' homophilous and credible identifications with sources, or due to the conversational nature of the information presented in these interactive discussions (Slater, Buller, Waters, Archibeque, & LeBlanc, 2003). Whether homophily directly affects health message evaluation and outcomes, or affects credibility judgments also deserves exploration in an online health information setting; such an approach has been adopted in this study.

## METHODS

### Participants and Procedures

A total of 97 participants completed the study. Due to the nature of the topic, this study used an adult sample that was recruited using one of two methods. For one, parents of students taking an introductory communication course were contacted. An e-mail solicitation was sent to the students with a request to forward it to a parent. This strategy yielded 46 viable responses. Second, individuals who had posted to cancer-related Usenet newsgroups were recruited via e-mail. E-mail addresses were collected from individuals who had posted at least one message in the 4 weeks preceding solicitation to Usenet groups with the word "cancer" in the group name. Obvious bogus addresses and duplicates were removed prior to solicitation; 51 respondents completed the study via this route. Neither method allows certainty with respect to the actual number of individuals who received the participation request. Final demographics indicated an average age of 50.59 ( $SD = 10.60$ ), with females constituting 60% of the sample. Other than these demographics, participation was anonymous in every way.

The e-mail recruitment message introduced the purpose of the study, gave a URL for a Web page, and indicated that participants would be shown an example of some online information and would then answer some questions. Once the participants clicked the URL, they were brought to a Web page containing instructions, a privacy policy, and contact information for the experimenters, as well as a button to click in order to continue. On clicking this button, a JavaScript routine randomly redirected the participant to one of eight versions of the stimuli.

### Stimulus Materials

Single-page mock-ups were created for delivery via the WWW, featuring a Web site or a discussion board

posting. For Web pages, care was taken to promote a sufficient range of credibility reactions by considering the results of Walther et al.'s (2004) study on the effect of top-level domains and advertisements on health Web site credibility. That study found that the .gov domain with advertisements garnered the greatest standard deviations on the credibility measure compared to other combinations of domain and ads. By using site characteristics with more moderate and more variable credibility associations, the effect of other variables on credibility judgments are not skewed by the site's topography features. Therefore, this study employed the "cancer.gov" with ads (for consumer-level pharmacological books) on the mock-up Web pages. Within the Web pages, the health information message (related to chemotherapy/nausea or coping) was presented as "Today's Tip."

The Usenet newsgroup version of messages was designed to look like a common bulletin-board posting. Framed by a common newsreader window, the message was preceded by a header containing a poster's name, the date and time at which the message was posted, the name of the newsgroup (alt.support.cancer), and the subject of the message. An example of the Web page stimulus and the Usenet stimulus can be seen on the WWW at <http://www.cmcresearch.org/hcfigures/>.

Although the central hypotheses involved a Web site vs. Usenet between-subjects design, stimulus presentations were further varied to avoid confounding the variables of interest with style and content features. For instance, didactic styles may be somewhat more common on Web sites, whereas narrative forms are more common in discussion groups. Previous research alerts us to potential evocative and therapeutic aspects of online narratives and disclosure (e.g., Preece, 1999; Wright & Bell, 2003; see also Winzelberg, 1997). Simultaneously, online health information can provide instrumental and/or coping support.

Thus, in creating stimuli, a full array was created for both Web-page stimuli and discussion board message stimuli, such that each basic type was completely crossed with two message styles (didactic or narrative) and further with two content types (instrumental vs. coping). The didactic and narrative versions of coping stimuli dealt with how to deal with feelings of inadequacy when a family member had late-stage cancer. The two versions of instrumental stimuli were about how to deal with the nausea from chemotherapy. The resulting  $2 \times 2 \times 2$  stimulus variety allowed a more exacting test of Web versus discussion formats while controlling for potentially confounding variations due to style and content. The analyses did not reveal that these factors substantially changed the main pattern of results of the hypothesized variables; thus further analyses collapsed on these variables and they are not discussed further.

On each of the eight stimulus presentations, there was a button for participants to click, leading them to the questionnaire.<sup>1</sup>

## Measures

The questionnaire featured clickable “radio buttons” administering the homophily scale, credibility items, and the influence of information questions, with demographic items at the end of the questionnaire. Once participants completed the questionnaire and submitted the answers, they were brought to a thank-you page.

**Credibility of online health information.** This measure was adopted from the work of Walther et al. (2004), which explored the most useful way to measure users’ credibility perceptions for online health information. This research combined bipolar adjective scale items previously employed for a variety of other media and settings, including speaker, news, media, and other credibility measures, and produced very traditional factors of Safety, Trustworthiness, and Dynamism in relation to online health information. In the present administration, this 16-item measure did not reflect subscales, but achieved unidimensional reliability (Cronbach’s  $\alpha$ ) of .93. Items included “Is accurate/Is inaccurate,” “Can be trusted/Cannot be trusted,” and “Is factual/Is opinionated.”

**Homophily.** Homophily was assessed using the 8-item bipolar scales developed by McCroskey et al. (1975). Observed alpha reliability was .84. This assessment has been used in numerous studies and is considered a valid and reliable measure (for a review, see Rubin, Palmgreen, & Sypher, 1994). Sample items included “Thinks like me/Doesn’t think like me,” “Concerns like mine/Concerns unlike mine,” and “Experiences like me/Experiences unlike me.”

**Evaluation of online health information.** This was operationalized using five original Likert-type items reflecting respondents’ assessments of the utility and veracity of the message,  $\alpha = .87$ . These items consisted of “I believe that what this source said was true,” “The source gave good advice,” “I would NOT recommend this advice to a friend or relative who had cancer” (reverse coded), “If I had the problem(s) presented here, I would do as this advice suggests,” and “The recommendation was useful.”

**Likelihood to act on the advice.** This was measured by asking how likely the respondent would be to recommend to another person the advice that had been offered in

our stimulus messages. This assessment involved the score on one of two different questions, both of which appeared on each participant’s questionnaire, the critical item depending on which topic the participant had read. For the 56 participants who received the coping stimuli (dealing with how to cope when a family member had late-stage cancer), the critical question asked how likely they would recommend to someone whose parent was terminally ill and had trouble coping “Don’t expect you can do something that doctors cannot.” Correspondingly, for the 40 participants who received the instrumental stimuli (how to deal with the nausea from chemotherapy), the question was about how likely they were to recommend to someone experiencing nausea from chemotherapy to use a bean bag chair to achieve a nonnauseating sleeping posture.

## RESULTS

### Testing Hypothesized Models

Our data were analyzed in two stages. The first stage reflects direct hypothesis tests, i.e., that for health-related Web sites, credibility affects message evaluation and likelihood to act on advice; for online peer discussion groups, homophily drives message evaluation and likelihood to act on the advice. In the second stage of the analyses, we included the variables that were not specified in each hypothesis to examine whether the hypotheses accounted for the data better than other emergent relationships.

To test the proposed interconnections among the variables, we tested hypothesized *a priori* models of structural relationships among the variables for fit against our data by using LISREL (Jöreskog, 1993). Instead of choosing traditional mediation models (e.g., path analysis), we employed structural equation modeling (SEM) in this study. SEM is advantageous because it not only takes the measurement error into account but also allows for the simultaneous estimation of all parameters in the model and produces an overall model fit (Grapentine, 2000; Jöreskog, 1993). LISREL can account not only for all of the links from exogenous to endogenous variables but also for the relationships among all endogenous variables. Any given coefficient therefore represents the relationship between two variables, controlling for all other relationships and variables in the model. By treating endogenous variables as both independent and dependent variables, SEM allows for the estimation of direct and indirect effects. In this study, we followed the “model generating” approach (Jöreskog & Sörbom, 1996) in which we developed initial theoretical models and tested them with empirical data, then adjusted the models by freeing or fixing some of the paths based on the Lagrangian Multiplier (LM) test (Bollen, 1987) to assess

<sup>1</sup>Originally we planned to include a hybrid form of online health information as a control to examine the antecedents that affect the influence of online health information. However, due to the limited and unbalanced data points for this condition, we excluded the hybrid form from the data analysis for the effect of interface format on the influence of the online health information.

whether the hypothesized models did or did not provide the optimal accounts of the data.

Although some researchers raise concerns about sample sizes as modest as the present one for SEM, some of these same researchers acknowledge that the sample size requirement for SEM lacks “a hard-and-fast rule” (Holbert & Stephenson, 2002, p. 536) and there is no rule of thumb that applies to all situations for which SEM is suitable (Muthén & Muthén, 2002). Hoyle and Kenny (1999) found that the type of modeling approach can mitigate sample size concerns and note that the “observed variable” modeling approach, which is used here, is the least affected by  $N$ . Researchers have demonstrated that simple, 3- or 4-variable models using reliable measures and acceptable observations-to-parameter estimate ratios are robust to small sample sizes, especially when testing hypotheses (Hoyle & Kenny, 1999; Tanaka, 1987), each of which criteria the current analysis satisfied. Moreover, the goodness-of-fit indexes in this study (e.g., goodness-of-fit index [GFI], adjusted-goodness-of-fit index [AGFI], root mean square error of approximation [RMSEA], and standardized root mean square residual [SRMR], which is sensitive to sample sizes) met the conventional criteria established by prior literature (e.g., Holbert & Stephenson, 2002; Hu & Bentler, 1999). Although a greater sample size may produce a somewhat stronger test of the overall model structure, the obtained effect sizes and significant individual relationships suggest that the sample was adequate to the task and the relationships are robust within the mediating models.

### Web Site Credibility Results

First-stage results confirmed H1. Participants who perceived higher levels of credibility for the Web site gave higher evaluations of the online health information the Web site presented ( $\gamma = .55$ ), which led to greater likelihood to act on the advice offered in that particular message ( $\beta = .52$ ). The model fit the data very well,  $\chi^2(1, N = 39) = .36$ ;  $p = .55$ , SRMR = .02, RMSEA = .00; the GFI and the AGFI—controlling for multivariate nonnormality—were both close to perfect, with values of .99 and .96, respectively. This model explains 31% variance of evaluation of health information online and 27% variance of likelihood to act on advice. H1 was supported.

### Discussion Group Homophily Results

H2 was also supported. For health information presented in a discussion group, participants who perceived higher levels of homophily gave higher evaluations of that information ( $\gamma = .65$ ), leading to greater likelihood to act on the advice offered in that particular posting ( $\beta = .53$ ). The fit of the hypothesized model to the data was very good,  $\chi^2(1, N = 34) = .55$ ,  $p = .46$ ; SRMR = .03, RMSEA = .00, GFI = .99, and AGFI = .93. The model explains 43% of the variance of evaluation of health information online and 28% of the variance of likelihood to act on advice.

### Expanded Analyses

In the second stage, we further included all variables—both credibility and homophily—in the structural equation model to see if alternative models better accounted for the data than those originally hypothesized. An alternative model for information on Web sites described the data well, with  $\chi^2(3, N = 39) = 1.72$ ,  $p = .63$ ; SRMR = .03, RMSEA = .00, GFI = .98 and AGFI = .93. The expanded model, as shown in Figure 1, shows that homophily directly drives both credibility ( $\gamma = .76$ ) and evaluation of health information ( $\gamma = .60$ ). In turn, evaluation of health information affects likelihood to act on advice offered in the information ( $\beta = .52$ ). Credibility itself affects neither evaluation of health information nor likelihood to act on advice. This model explains 58% of the variance in credibility, 36% of the variance of the evaluation of health information, and 27% of the variance of likelihood to act on advice, a greater amount of variance (in message evaluation, particularly) than explained by the original, hypothesized model.

The full model for information on discussion groups fit the data relatively well, with a  $\chi^2(3, N = 34) = 5.49$ ,  $p = .14$ ; SRMR = .04, RMSEA = .13, GFI = .93, AGFI = .78. The model involving both homophily and credibility explains much more variance overall compared to the first model—65% of the variance in credibility, 72% of the variance in evaluation of health information, and 28% of the variance in likelihood to act on advice. However, goodness of fit characteristics raise questions about the comparative utility of this model.

Figure 2 reveals a different pattern of influence in discussion groups compared to Web sites. It shows that homophily

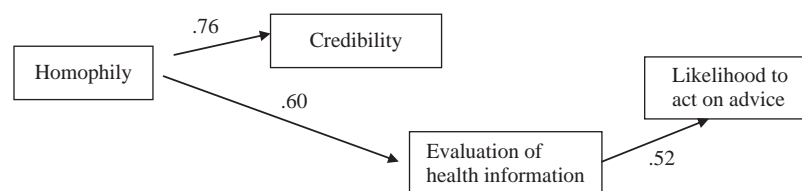


FIGURE 1 Second-stage analysis of full model, Web site. Note.  $\chi^2 = 1.72$ ,  $df = 3$ ,  $p = .63$ , SRMR = .03, RMSEA = 0.0, CFI = 1.00, GFI = .98, AGFI = .93.

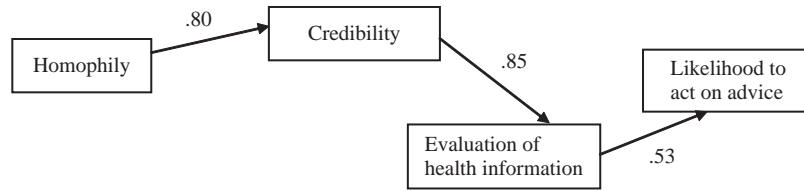


FIGURE 2 Second-stage analysis of full model, Discussion Group. Note.  $\chi^2 = 5.49$ ,  $df = 3$ ,  $p = .14$ , SRMR = .04, RMSEA = .13, CFI = .97, GFI = .93, AGFI = .78.

directly drives credibility ( $\gamma = .80$ ), which in turn directly leads to evaluations of health information ( $\beta = .85$ ). Meanwhile, evaluation of health information leads to the likelihood to act on advice offered in the information ( $\beta = .53$ ).

## DISCUSSION

This study attempted to ascertain the underlying mechanisms that guide the users of online health information in evaluating and utilizing such information in two communication channels: Web sites and online discussion groups. Two different, but related, constructs were identified and examined as the driving forces for online health information evaluation and utilization: credibility and homophily. Hypothesis testing confirmed predictions that when viewing Web sites, credibility drives evaluation of health information and, subsequently, leads to likelihood to act on advice. In contrast, homophily is the determining factor in the evaluation of information in online discussion groups.

Judging by the interrelationships between variables in the full structural models, we find that the role of homophily in information evaluation and utilization has been undervalued in prior research, especially with regard to the impact of homophily on credibility. For both Web sites and discussion groups, homophily was found to drive credibility ( $\gamma = .76$  for Web sites;  $\gamma = .80$  for discussion groups). Moreover, this pattern was robust across several other variations in presentation. Several other models (coping vs. instrumental advice, and didactic vs. narrative formats) were tested, and the homophily–credibility link was detected across all of these permutations.

Another interesting finding in this study is the relationship between message evaluation and the decision to act on the advice. The more positive the evaluation of the health information stimuli, the more likely people were to adopt the advice offered in that particular piece of information. This perception–intention–action link is meaningful, illustrating how the social influence process works with regard to online health information. Moreover, it is consistent with the implicit theoretical notions about communication affecting intervening variables and ending with intention (e.g., Ajzen & Fishbein, 1980). The models generated in this study appear to show that credibility and homophily have suasive, instead of direct, effects on behaviors. They work

through the intervening variable, the evaluation of health information, to prompt the decision one makes.

Last, in both Web sites and discussion groups, homophily has a positive impact on both evaluation of health information and the likelihood to act on advice either directly or indirectly. However, credibility affects these two variables only in discussion groups. Therefore, we argue that homophily is really the factor that grounds credibility and drives the whole persuasive process in the context of online health information. Although expertise, a dimension of credibility, is important, credibility itself is not what differentiates influential from uninformative advice.

The impact of homophily in discussion board information thus calls to mind the hyperpersonal potential of interactive online discussions. The difference between Web sites and online discussion boards, of course, is not limited to the message source but also includes the degree of interactivity these settings provide. These venues offer what Wallace (1999) called a “sign on the door” effect, that is, that users enter these conversation spaces assuming that others who posted there have common experiences and concerns, as patients, family members, or survivors of the malady that is the focus of the discussions. Homophily is hardly surprising under such conditions. Yet similarity and its reciprocation of disclosure can be especially intense in such groups (see Turner et al., 2001), and the relationship between disclosure, intimacy, and similarity is well established. Traditional Web sites, on the other hand, do not offer the kind of interaction that might foster similarity and trust. Thus, in this study, discussion boards may connote users’ experiences of hyperpersonal communication online, a dynamic in which interpersonal similarity and attraction are magnified and reciprocated through CMC, driving up similarity’s suasive force.

Some limitations of this study deserve comment. The limited sample size precludes the search for latent variables or paths of influence other than those predicted or imagined among a finite set of composite variables. Whether subdimensions of any major variables in the research exist and respond differently to stimuli is not possible to explore with these data. In addition, this research rendered constant features that are known to affect Web site credibility (e.g., site, source, domain), although features were selected that allowed a wide rather than restricted range of credibility



reactions to Web-based health information (Walther et al., 2004). On the Internet, these features vary widely, and direct manipulation of credibility features warrants additional testing. Yet study and commentary about credibility on the Web suffers no lack of attention, whereas homophily garners much less attention. This research demonstrates how homophily and credibility intertwine and jointly affect the evaluation and utilization of online health information in Web sites or electronic discussion groups.

Recognition of the homophily–credibility link may facilitate more useful and persuasive online health information. Future research should pay more attention to the promotion and identification of homophily mechanisms, both in static and participatory online venues. With the rapid diffusion of the Internet and the increasing popularity of online support, understanding how people rely on either credibility or homophily offers great practical implications. These findings raise questions about the medical establishment's efforts to increase the credibility of online health information. Such efforts may divert from potentially more useful directions. Ironically, concerned over the threat to their expert status that online peer discussions are perceived to pose to medical specialists (Broom, 2005), medical associations have attempted to improve expertise perceptions in their Web presence. These results suggest that strategies directed at credentialing online information through expertise and differential status may ultimately be less effective with respect to end users' evaluations. Instead, homophily-based strategies that emphasize common rather than heterogeneous knowledge, experience, background, and views may have greater influence. In other words, advice from "similar others" is more powerful than experts' advice when it comes to online health information. Explicitly providing linkages to both experts and peers may constitute an optimally effective strategy, if health providers can indeed afford to do so (see, e.g., Gustafson et al., 2001). To do so, the medical establishment will need to temper its view of peers as poor online sources for health information.

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