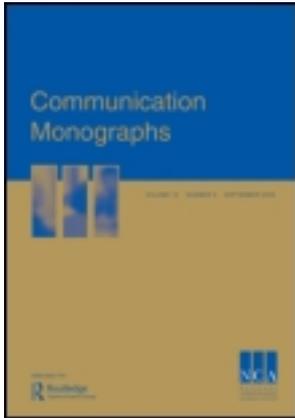


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The Social Dimension of Blogging about Health: Health Blogging, Social Support, and Well-being

Stephen A. Rains & David M. Keating

The study reported here explored the social dimension of health-related blogs by examining blogging as a means to marshal social support and, as a result, achieve some of the health benefits associated with supportive communication. A total of 121 individuals who author a blog dedicated to their experience living with a specific health condition completed the study questionnaire. The number of blog posts made by respondents and proportion of posts with reader comments were positively associated with perceived social support from blog readers. The relationship between blog reader support and two outcomes related to well-being depended upon the support available in bloggers' strong-tie relationships with family and friends. Consistent with the social compensation (i.e., "poor get richer") perspective, blog reader support was negatively associated with loneliness and positively associated with personal growth when support in strong-tie relationships was relatively lacking.

Keywords: Blog; Social Support; Health Communication; Communication Technology

The development and widespread diffusion of new communication technologies made possible by the Internet has had several noteworthy implications for health communication. One important implication involves increasing access to and facilitating the exchange of social support (Cummings, Sproull, & Kiesler, 2002; Wright & Bell, 2003). Social support, an umbrella term that generally refers to the link between one's well-being and relationships with others (Albrecht & Goldsmith, 2003; Goldsmith, 2004), is associated with a range of positive health outcomes including benefits for physiological functioning (Uchino, 2004) and psychosocial

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well-being (Smith, Fernengel, Holcroft, Gerald, & Marien, 1994). Although several studies have been conducted to examine supportive communication in the context of computer-mediated support groups (for a review, see Rains & Young, 2009; Tanis, 2008), other communication technologies such as health-related journals posted to web-logs (i.e., blogs) might serve as a resource and have unique implications for marshalling information and emotional support. Blogging is a fundamentally social activity (Nardi, Schiano, & Gumbrecht, 2004; Stefanone & Jang, 2008) in which individuals may discuss publicly their concerns, insights, and experiences living and coping with a health condition (Miller & Pole, 2010; Sundar, Edwards, Hu & Stavrositu, 2007). Health blogs have the potential to serve as a means of acquiring social support and fostering at least some of the health benefits associated with supportive communication and relationships.

The study reported here explores the social dimension of health-related blogging by examining the relationships among health blogging, social support, and psychosocial well-being. Two objectives are central to this project: First, blogging is examined as a possible mechanism through which individuals marshal social support and achieve some of the health benefits of supportive communication. Health blogs make it possible to reinforce connections with existing strong ties and form new connections with weak ties. Moreover, normative elements of the blog genre and technical dimensions of blogs may create opportunities for bloggers and blog readers to manage some of the facework dilemmas that are inherent in supportive interactions. The association between health blogging (e.g., post frequency, mean words written per post, etc.) and perceived social support available from blog readers is examined, as is the relationship between blog reader support and outcomes related to psychosocial well-being (e.g., loneliness, social functioning, health self-efficacy, etc.).

Second, the implications of support from bloggers' strong-tie relationships with family and friends are considered. Research examining weak ties as support resources (Adelman, Parks, & Albrecht, 1987; Wright & Miller, 2010) and the consequences of new communication technology use for social connection and well-being (Bessiere, Kiesler, Kraut, & Boneva, 2008; Kraut et al., 2002) suggests that the availability of support from bloggers' strong ties may have important implications for the outcomes of health blogging. Blogging might differentially benefit some individuals based on the availability of support from their family and friends. Two perspectives are tested to better understand the implications of strong-tie support. The social enhancement (i.e., "rich get richer") perspective (Kraut et al., 2002) suggests that those individuals who have relatively greater levels of support from family and friends available are most likely to achieve support and health-related benefits from blogging. The social compensation (i.e., "poor get richer") perspective (Kraut et al., 2002) proposes that blogging will be most beneficial to those individuals lacking support from family and friends.

Through examining blogging as a means to marshal support resources and the commensurate health benefits of supportive communication, this project advances research and theory about new communication technologies, social support, and

health. Blogging is a novel context in which to study social support and some of the opportunities created by communication technologies that might facilitate supportive communication. Examining health blogging also offers an avenue to explore the interrelationship between strong and weak ties as support resources and their implications for well-being. In the following sections, we discuss research related to social support and health and then consider the implications of health blogging for social support and psychosocial well-being.

Literature Review

Social Support and Health

Social support refers to communication that serves to help manage uncertainty and increase perceptions of control regarding one's life (Albrecht & Adelman, 1987a; Albrecht & Goldsmith, 2003). Two of the most widely cited explanations for the potential health benefits of social support are the buffering model and the main effect model (for a review, see Cohen & Wills, 1985). The buffering model focuses on the role of social support as a mediator between a stressful event and a stress response, whereas the main effect model is concerned with the ways in which membership in a social network may improve an individual's overall well-being and better enable the individual to manage stressful events. Although several different types of support and commensurate supportive messages have been classified (Cutrona & Suhr, 1992; House, 1981; Willis, 1985), this project focuses on social support in the form of information and emotional support. Information support involves advice, factual input, and feedback regarding one's actions; emotional support consists of messages that communicate caring, concern, sympathy, and empathy (Cutrona & Suhr, 1992). Emotional and information support were the most common types of support documented in at least two studies of computer-mediated support groups (Braithwaite, Waldron, & Finn, 1999; Mo & Coulson, 2008).

The implications of various sources of social support have also received attention in research examining social networks and supportive communication (for a review, see Albrecht & Adelman, 1987b; Albrecht & Goldsmith, 2003). Strong-tie relationships consisting of family and friends are a primary source of social support (Albrecht & Adelman, 1987b; Albrecht & Goldsmith, 2003; Griffith, 1985). Social support from family and friends can be—but is not always (e.g., Coty & Wallston, 2010)—a particularly important resource during illness and has been linked with improvements in well-being ranging from increased health self-efficacy (Arora, Finney Ruten, Gustafson, Moser, & Hawkins, 2007) to reduced loneliness (Serovich, Kimberly, Mosack, & Lewis, 2001) and depression (Metts, Manns, & Kruzic, 1996). In addition to family and friends, weak ties (Granovetter, 1973, 1982) such as neighbors and other acquaintances are another potential support resource. Adelman et al. (1987, p. 126) discuss weak ties in the context of social support as “supporters who lie beyond the primary network of family and friends,” including people whose networks do not overlap substantially, have low levels of interdependence, and

interact only in limited contexts. Wright and Miller (2010) argue that, relative to strong ties, weak ties are more likely to share similar experiences with a health condition, offer greater objectivity, present less risk associated with self disclosure, and have fewer role obligations and social complications. The widespread diffusion of communication technologies facilitated by the Internet has made it possible to reinforce connections with strong ties (Stafford, Kline, & Dimmick, 1999; Stefanone & Jang, 2008) and increase access to weak ties (Tanis, 2008; Wright & Bell, 2003; Wright, Rains, & Banas, 2010).

Health Blogging and Social Support

It is estimated that 8% of adult Internet users—totaling 12 million Americans—author a blog (Lenhart & Fox, 2006). Blogs are generally defined as “web-based journals in which entries are published in reverse chronological sequence” (Herring, Scheidt, Bonus, & Wright, 2004, p. 1). Blogs may also contain an archive of previous entries, a space where readers can make comments, and links to other blogs that the author presumably follows (i.e., a blogroll) (Schmidt, 2007). Although several genres of blogs have been identified (Herring et al., 2004), this project focuses on blogs that serve as personal journals written by an individual coping with a health condition. Research conducted on health-related blogs generally (Miller & Pole, 2010) and mental-health blogs specifically (Sundar et al., 2007) suggests that blogs focusing on a single individual’s experience with a health condition are among the most common type of health-related blogs.

An important characteristic of blogging is that it is a fundamentally social activity (Nardi et al., 2004; Stefanone & Jang, 2008). A blog has an audience who, in some cases, may be able to provide direct feedback to the author in the comments portion of the blog, through email, or even face-to-face (Stefanone & Jang, 2008; Sundar et al., 2007). In publicly sharing one’s experience with and insights about one’s health condition, it is plausible that blogging is used as a means to marshal social resources such as social support (Miller & Pole, 2010; Schmidt, 2007; Sundar et al., 2007). Indeed, Miller and Pole (2010, p. 1516) explain the findings from their survey of health bloggers by suggesting that “health blogs are being used, in part, to forge support networks among bloggers and their readers.”

Theorizing about weak ties (Granovetter, 1973, 1982; Wright & Miller, 2010) and the role of facework in social support (Goldsmith, 1992, 1994) suggests at least two reasons that blogging might serve as a mechanism to marshal social support from both strong and weak ties and, as a result, foster positive outcomes for bloggers’ well-being. First, blogs may make it possible to identify and connect with strong and weak ties who are motivated to provide information and emotional support. A significant challenge of acquiring support in strong-tie relationships is managing concerns for social equity and the potential to overburden support providers (Albrecht & Adelman, 1987a; Goldsmith, 2004). Sharing information in a blog reduces the potential burden on any single member of one’s strong-tie network. The audience for blogs is undifferentiated in that blogs are typically not written for or

to any single audience member (Gurak, 2008)—though there may be exceptions (Nardi et al., 2004). Unlike a face-to-face conversation, an individual blog reader has no obligation to enact or feign support. Members of a blogger's strong-tie network can choose to not leave a comment and/or, when they interact with the blogger face-to-face, not mention the blog. Blogs also make it possible to connect with weak ties who may not personally know the blogger, but are coping or have coped with the same health condition. Weak ties are a novel resource (Granovetter, 1973, 1982) and, in the domain of health, may represent an alternative to support from strong ties (Wright & Miller, 2010). Weak ties provide access to new information, facilitate social comparison, and offer a lower-risk outlet for self disclosure (Adelman et al., 1987; Wright & Miller, 2010). As a broadcast medium that has the potential to be read by a number of people (Nardi et al., 2004; Trammell & Keshelashvili, 2005), blogs may be a useful mechanism for increasing one's access to weak ties. The public record of one's experiences created through blogging may serve as a beacon to weak ties with similar histories who are motivated to provide information and emotional support.

Second, technical and normative dimensions of blogging might create opportunities for support seekers and providers to manage face concerns and help mitigate some of the dilemmas that characterize the acquisition and provision of social support. Goldsmith (1992, 1994) uses politeness theory and the notion of facework (Brown & Levinson, 1987) as a framework to better understand some of the competing goals that present challenges during supportive interactions. She contends that positive and negative face threats may occur in the process of seeking and providing support. Positive face involves one's positive self-image (Brown & Levinson, 1987) and may be threatened if support seekers disclose undesirable information or if support providers appear uncaring or unable to provide sufficient support. Negative face involves one's autonomy (Brown & Levinson, 1987) and can be threatened if support providers feel burdened by having to provide support or if support seekers feel compelled to comply with advice from support providers.

Blogs are an asynchronous form of communication in which many of the nonverbal cues available in face-to-face interaction (e.g., eye contact, gesture, etc.) are absent or reduced. These two features may create opportunities for bloggers (as support seekers) and blog readers (as support providers) to mitigate positive face threats. Bloggers have the opportunity to consider their messages before sharing them and present their circumstances in the best light possible. The ability to share their experience without having to make eye contact or witness the nonverbal responses of support providers may alleviate embarrassment associated with disclosing undesirable information—particularly in the case of stigmatized health conditions. The asynchronous nature of blogs makes it possible for readers to review an entire post or series of posts prior to responding. Blog readers may be able to learn a great deal about a blogger's experiences and develop an understanding of what might be considered an appropriately face-sensitive supportive message. The opportunity for asynchronous interaction and reduced social cues may also help mitigate negative face threats. Bloggers may not feel compelled to comply with advice or suggestions from blog readers and blog readers may not feel obliged to provide support and post

a comment in response to a blog. Beyond these two technical dimensions, the genre of blogging makes appropriate extensive self disclosure (Herring et al., 2004; Qian & Scott, 2007). Sundar et al. (2007, p. 85) explain that blogs “allow long narratives and are generally considered a forum for personal commentary.” Bloggers can discuss their experiences and needs at length without violating general conversational norms associated with self disclosure and appearing socially incompetent. Together, the technical and normative dimensions of blogging may facilitate supportive interactions by allowing bloggers and blog readers to manage face concerns that make seeking and providing support challenging.

Hypotheses and Research Questions

The preceding discussion provides a foundation for one set of hypotheses and one set of research questions regarding health blogging, social support, and well-being. The set of hypotheses considers the relationship between health blogging and social support from blog readers as well as the relationship between social support from blog readers and health outcomes related to well-being. The set of research questions focuses on the role of strong-tie support from family and friends as a moderator of the preceding relationships.

Health Blogging, Social Support, and Well-Being. Blogging may be a means for marshalling social support from blog readers. Beyond making it possible to reinforce or increase access to strong and weak ties, technical and normative dimensions of blogging may help bloggers and blog readers to effectively manage some of the facework dilemmas inherent in acquiring and providing social support. Accordingly, blogging about health-related issues is predicted to be positively associated with perceived social support from blog readers (potentially consisting of both strong and weak ties). Individuals who blog more frequently and whose posts generate more reader responses should generally perceive more support from blog readers. In particular, blogging frequency, mean words written per post, mean reader responses per post, and the total proportion of posts with a response should all be positively associated with perceived social support from blog readers.

H1: Perceived social support from blog readers is positively associated with (a) blogging frequency, (b) words per blog entry, (c) unique reader comments per entry, and (d) proportion of entries with at least one reader comment.

Moreover, some of the health benefits of supportive communication might extend to perceived social support acquired from blog readers. Information and emotional support should function to increase bloggers' knowledge about managing a health condition and help make them feel cared for and understood. As such, blog reader support should be associated with health benefits for bloggers. Prior research demonstrates that, in the context of coping with illness, social support is associated with increased health self-efficacy (Arora et al., 2007), reduced loneliness (Serovich et al.,

2001), and increased social functioning involving the degree to which one's health interferes with social activities (Aalto, Uutela, & Aro, 1997). In addition to these factors, it seems plausible that blog reader support could play an important role in bloggers' outlook on their life during or with illness. Ryff and Singer (1998) contend that feeling a sense of purpose in life and personal growth are essential elements of well-being. During significant life events such as coping with illness, these two factors may activate physiological processes (e.g., immune functioning) central to maintaining or protecting physical health. Information and emotional support from blog readers may improve a blogger's outlook and help him or her feel a sense of growth and purpose in life during illness. In summary, blog reader support should be positively associated with bloggers' health self-efficacy, social functioning, sense of purpose in life, and feeling of personal growth and negatively associated with loneliness.

H2: Perceived social support from blog readers is positively associated with perceptions of (a) health self-efficacy, (b) social functioning, (c) purpose in life, and (d) personal growth and negatively associated with (e) loneliness.

The Implications of Strong-Tie Support. Blogging is argued to be a novel means of acquiring social support because it creates opportunities to reinforce existing connections with strong ties and to create new connections with weak ties. Yet it seems plausible that the outcomes of blogging may be dependent upon the availability of support from bloggers' strong ties. Although strong ties such as family and friends are instrumental support resources (Albrecht & Adelman, 1987b; Albrecht & Goldsmith, 2003), there are instances—particularly in the context of health—when strong ties may be unable or unwilling to provide effective support (Adelman et al., 1987; Wright & Miller, 2010). Moreover, research examining the use of Internet-based communication technologies to acquire social resources (Kraut et al., 2002; Lee, 2009; Valkenburg & Peter, 2007; Zywicka & Danowski, 2008) and foster improvements in well-being (Bessiere et al., 2008) has found evidence consistent with the idea that the social and health outcomes of Internet use are dependent upon the quality of one's existing strong-tie relationships. In this work, two perspectives are advanced to explain how existing strong-tie relationships influence the outcomes of Internet use. The social enhancement and social compensation perspectives serve as a useful foundation from which to examine the implications of strong-tie support for health blogging.

The social enhancement (i.e., "rich get richer") perspective (Kraut et al., 2002) suggests that individuals who have access to relatively greater levels of support from strong ties may benefit most from health blogging. This perspective is founded on the notion that individuals who "have existing social support will get more social benefit from using the Internet" (Kraut et al., 2002, p. 58). Among individuals who have satisfactory support from family and friends, Internet-based technologies might be a means to reinforce their existing relationships and make new connections that might serve as additional support resources. Blogs represent a mechanism for informing

existing strong ties about one's illness as well as expanding one's network by adding new weak-tie members. In contrast to the social enhancement perspective, the social compensation (i.e., "poor get richer") perspective (Kraut et al., 2002) suggests that people who lack support from strong ties would most benefit from health blogging. Through marshalling support from blog readers, it may be possible to overcome support deficits from strong ties and, thus, achieve health benefits associated with supportive communication. Indeed, insufficient strong-tie support has been argued to be one factor motivating the use of computer-mediated support groups to access weak ties (Tanis, 2008; Wright & Bell, 2003; Wright et al., 2010).

The preceding discussion suggests that the quality of strong-tie support available from family and friends might moderate the relationship between health blogging and perceived support from blog readers as well as the relationship between blog reader support and health outcomes related to well-being. Because the social enhancement and social compensation explanations for the implications of strong-tie support are equally plausible, the following three research questions are proposed. Answering these questions will make it possible to better understand the consequences of strong-tie support from family and friends for health blogging.

- RQ1: Does a relationship exist between perceived support from blog readers and perceived support from family and friends?
- RQ2: Does perceived support from family and friends moderate the relationships between perceived social support from blog readers and (a) blogging frequency, (b) words per blog entry, (c) unique reader comments per entry, and (d) proportion of entries with at least one reader comment?
- RQ3: Does perceived support from family and friends moderate the relationships between perceived social support from blog readers and (a) health self-efficacy, (b) social functioning, (c) purpose in life, (d) personal growth, and (e) loneliness?

Method

Sampling Procedure and Respondents

An extensive search was conducted to identify individuals who author a personal-journal type blog (Herring et al., 2004) focusing on their health. A general goal guiding the recruitment of respondents was identifying a sample of bloggers as representative as reasonably possible of the population of individuals who are coping with a physical or mental health condition and actively blogging about their experiences with that condition. Two general strategies were used to locate the sample for this project.

The first strategy involved using Google and Yahoo!'s search engines to search four popular blog-hosting websites using 22 different search phrases. Blogspot.com, wordpress.com, typepad.com, and livejournal.com are four of the most popular blog-hosting websites used by Americans (Lenhart & Fox, 2006) and were the focus of the searches conducted for this project. Each of these four websites makes authoring a blog accessible to people who lack website design or programming knowledge. Each

search was limited to blogs posted on one of the four blog-hosting websites that were written in English and updated in the previous few months.

Twenty-two different search phrases were used to conduct the searches. Five terms generally related to health were used to ensure that a range of health conditions was represented in the sample: disease, condition, disability, illness, and disorder. To ensure that health conditions common in the United States were represented, six search terms that refer to specific conditions were also used: heart disease, cancer, Alzheimer's, diabetes, depression, and HIV. The former four conditions are among the most common causes of mortality from illness in the United States (Centers for Disease Control and Prevention, 2009); the latter two conditions are similarly common and serious health concerns (Beck & Alford, 2009; Harmon, Barroso, Pence, Leserman, & Salahuddin, 2007). Each of these 11 terms referring to health in general or to a specific condition was then paired with two different qualifiers (i.e., living with; dealing with) to form the 22 search phrases (e.g., "living with" and "disease;" "dealing with" and "cancer;" etc.).

Google and Yahoo! searches were conducted examining the four blog hosting websites using the 22 search phrases. In total, 176 unique searches were conducted. Each search had the potential to yield up to 1000 results. To expedite the blog-identification process, 100 of the blogs resulting from each of the 176 searches were randomly selected and reviewed. Blogs were included in the sample if they met the following three criteria: (1) authored by an individual coping with a specific health condition, (2) focused on the author's experience with the condition, and (3) updated in the preceding six weeks. A total of 253 unique health blogs were identified.

The second strategy involved using the 253 blogs previously identified to locate additional health blogs. Each blogroll, which is a list of other blogs that the blog author follows or recommends, from the original 253 blogs was reviewed to identify additional health blogs that met the study criteria. This sampling procedure resulted in 131 additional health blogs. No significant differences were detected between the two samples for any of the predictor or outcomes variables examined in this project.

Together, the two search strategies yielded 384 active health blogs written by individuals coping with specific health conditions and focusing on their experiences with those conditions. All of the blogs identified can be considered public in that they were not password protected and were available to all potential readers. Each blog author was contacted and invited to participate in this project. A total of 121 respondents sufficiently completed the web-based questionnaire.¹ Respondents were mostly female ($n=89$, 77%) and had a mean age of 43.84 years ($SD=12.68$). Approximately 60% ($n=78$) of the respondents reported having completed college or more education. Almost all ($n=116$) of the respondents reported having been formally diagnosed by a medical doctor with the health condition about which they blog. Respondents reported having and blogging about one or more physical and mental health conditions including (but not limited to): Alzheimer's disease, Asperger's syndrome, bipolar disorder, cancer, eating disorders, fibromyalgia, depression, HIV, lupus, Lyme disease, multiple sclerosis, Parkinson's disease,

rheumatoid arthritis, traumatic brain injury, and Type 1 diabetes. Respondents estimated that approximately 70% ($SD = 22.89$) of their blog posts focus specifically on issues related to their health. Respondents had been writing the blog about which they completed the study questionnaire for a mean of 1.88 ($SD = 1.58$) years.

Instrumentation

Unless otherwise noted, all measures were rated on a seven-point scale with the anchors “strongly disagree” (1) and “strongly agree” (7).

Health blogging. All blog posts made by each respondent during the six weeks (42 days) prior to completing the questionnaire were reviewed by one of the authors. All posts were made between April and July of 2010. Blogs were coded based on the total number of posts (i.e., blogging frequency) made during the 42 day period ($M = 16.79$, $SD = 17.00$) and the mean number of words written per post ($M = 473.42$, $SD = 279.37$). Data were also collected regarding the behavior of each respondent’s blog readers. All of the blogs allowed readers to post comments; these comments were reviewed to identify the mean number of unique blog readers who posted a comment per blog entry ($M = 1.95$, $SD = 2.57$) and the proportion of blog entries with at least one comment ($M = 0.61$, $SD = 0.33$). All respondents agreed to allow their blogs to be reviewed for this project.

Social support. The medical outcomes survey (MOS) social support survey (Sherbourne & Stewart, 1991) was used to evaluate respondents’ perceptions about the availability of social support from blog readers and their family and friends. Respondents rated four items evaluating emotional support and four items evaluating information support. Ratings of emotional and information support were combined to create a single index of perceived support. Because this project focuses on support from family and friends as well as from blog readers, respondents rated the support they perceived available from both groups. Separate ratings were made about the perceived support available from family and friends ($M = 5.67$, $SD = 1.24$, $\alpha = .93$) and from blog readers ($M = 4.94$, $SD = 1.31$, $\alpha = .91$).

Measures of well-being. *Loneliness* was assessed with the four-item short form of the University of California at Los Angeles (UCLA) loneliness scale (Hays & DiMatteo, 1987; Russell, Peplau, & Cutrona, 1980) ($M = 2.79$, $SD = 1.21$, $\alpha = .79$). *Health self-efficacy* was measured using five items adapted from Lee, Hwang, Hawkins, and Pingree’s (2008) research that evaluate the degree to which respondents felt that they could positively impact their health ($M = 5.68$, $SD = 0.97$, $\alpha = .84$). The two-item *social functioning* subscale from the MOS short-form (Ware & Sherbourne, 1992) was used to evaluate the degree to which respondents felt that their health condition interfered with their social activities during the preceding six weeks. Because one of

the items was rated on a five-point scale and the other was rated on a six-point scale, each item was standardized and the mean of the two items was then computed ($M = 0.00$, $SD = 0.94$, $\alpha = .89$); larger scores for this measure indicate a greater amount of social functioning. Four-item versions of the *purpose in life* and *personal growth* subscales from Ryff's (1989) measure of psychological well-being were completed by respondents. The purpose in life subscale ($M = 6.05$, $SD = 1.05$, $\alpha = .80$) reflects the degree to which respondents felt that their life has meaning, and the personal growth subscale ($M = 5.91$, $SD = 1.07$, $\alpha = .83$) reflects respondents' beliefs that they are evolving and realizing their potential.

Control Variables. Five control variables were included in all of the analyses: age, gender, education, current health, and percentage of blog readers who were family and friends. Granted previous research demonstrating differences in social support based on age (e.g., Segrin, 2003) and gender (e.g., Burrell, 2002), these variables were included in the analyses as control variables. The mean age of respondents ($M = 43.84$, $SD = 12.68$) was previously reported as was the percentage of the sample that was female (77%). Education was included as a control variable because it has been argued to play an important role in outcomes of Internet use related to health communication (Shim, 2008). Education was assessed by asking respondents to self report their highest level of education completed on a six-point scale ranging from "less than high school" (1) to "graduate school" (6) ($M = 4.29$, $SD = 1.30$). Because respondents' health status at the time the questionnaire was completed might have systematically influenced their perceptions of support and the health-related outcomes evaluated in this project, respondents' self-reported *current health* was assessed and included as a control variable. Current health was measured with a single item evaluating the degree to which respondents perceived their general health to be "very poor" (1) or "very good" (7) ($M = 3.98$, $SD = 1.52$). Finally, the research questions ask about the relationship between support from one's family and friends and the social support derived from blog readers. However, support from blog readers was not necessarily independent of family and friend support; a respondent's family and friends may also have been blog readers. To account for this possibility, respondents were asked to estimate the percentage of their blog readers who were family and friends ($M = 23.67$, $SD = 25.63$). The percentage of blog readers who were family and friends was used as a control variable.

Results

Preliminary Analyses

Prior to testing the hypotheses, the data were first screened for outliers following Tabachnick and Fidell's (2001) recommendations. Univariate outliers were identified as those values that exceed the mean for a given variable by three or more standard deviations. Univariate outliers were identified for the following three variables related to health blogging: blogging frequency ($n = 1$), mean words written per post ($n = 1$),

and mean number of unique readers commenting per post ($n = 3$). In each instance, the outlying case was reassigned a value three standard deviations greater than the mean for the variable. One multivariate outlier was identified and excluded from the analyses. The zero-order correlations for the primary variables included in the analyses are displayed in Table 1.

Blogging about Health and Blog Reader Support

Hypotheses 1a–1d predict a relationship between health blogging and perceived support from blog readers. Research Questions 2a–2d ask whether support from family and friends moderates the relationships predicted in Hypotheses 1a–1d. One hierarchical regression model was constructed to address the preceding hypotheses and research questions. Because Research Questions 2a–2d inquire about an interaction effect, the four variables assessing health-related blogging and perceived support from family and friends were mean-centered (Cohen, Cohen, Aiken, & West, 2003). The regression model was constructed as follows: The five control variables (i.e., gender, age, education, estimated percentage of blog readers who were family and friends, and respondents' current health) were entered in the first block of the model. In the second block, the four variables assessing health blogging (i.e., total blog posts, mean words per post, mean unique readers commenting per post, proportion of posts with at least one reader comment) were entered. Perceived support available from family and friends was entered in the third block. In the fourth block, the interaction between the four variables assessing health blogging and

Table 1 Zero-order Correlations for Primary Variables Included in the Analyses ($N = 117\text{--}121$)

	1	2	3	4	5	6	7	8	9	10	11
1. Blog reader support											
2. Family and friend support	.01										
3. Total blog posts	.23*	.01									
4. Mean words per post	-.10	.00	-.20*								
5. Unique comments per post	.15	-.09	.04	.19*							
6. Proportion of posts with at least one comment	.24*	.10	-.03	.24*	.65*						
7. Health self-efficacy	.10	.27*	.06	-.08	-.18*	-.06					
8. Personal growth	.20*	.35*	.19*	-.15	-.07	-.10	.59*				
9. Purpose in life	.03	.31*	.09	-.17	-.04	-.04	.49*	.70*			
10. Loneliness	-.12	-.64*	-.08	.21*	-.02	-.15	-.29*	-.43*	-.39*		
11. Social functioning	.10	.25*	-.11	.08	.03	.12	.34*	.28*	.19*	-.18*	

* $p \leq .05$.

perceived support from family and friends was included. Perceived support available from blog readers served as the outcome variable.

The results of the regression model, which are depicted in Table 2, provide some evidence that health blogging is associated with perceived support from blog readers. After accounting for the control variables, blogging frequency and the proportion of posts with at least one comment were positively associated with perceived support from blog readers. These findings support Hypotheses 1a and 1d. However, the mean number of words per post and the mean number of unique reader responses per post were not associated with perceived support from blog readers. Hypotheses 1b and 1c were not supported. The results related to Research Questions 2a–2d indicate that perceived support from family and friends did not moderate the relationships between any of the measures of health blogging and perceived support from blog readers.

Blog Reader Support and Bloggers' Well-being

Hypotheses 2a–2e predict a relationship between perceived support available from blog readers and five health outcomes related to well-being: health self-efficacy, perceived social functioning, purpose in life, personal growth, and loneliness. Research Questions 3a–3e ask whether perceived support available from family and friends moderates the relationships predicted in Hypotheses 2a–2e. Granted the preceding hypotheses and research questions, five separate hierarchical regression

Table 2 Health Blogging and Social Support from Family and Friends as Predictors of Blog Reader Support

	β	t	R^2	ΔR^2
Block 1: Control variables			.11	.11*
Gender (female = 0)	-.13	-1.33		
Age	-.24*	-2.54		
Education	-.10	-1.02		
Current health	.05	0.50		
Proportion of readers who were family and friends	.08	0.85		
Block 2: Health blogging			.25	.14*
Total posts	.31*	3.49		
Mean words per post	-.11	-1.19		
Unique comments per post	-.04	-0.29		
Proportion of posts with at least one comment	.23*	1.95		
Block 3: Family and friend support			.25	.002
Block 4: Interactions			.26	.003
Family and friend support \times Total posts	.04	0.44		
Family and friend support \times Mean words per post	.03	0.34		
Family and friend support \times Unique comments per post	.001	0.01		
Family and friend support \times Proportion of posts with at least one comment	-.04	-0.29		

* $p \leq .05$. All variables in Blocks 2–4 are mean-centered. Outcome variable = Blog reader support. Model summary: $F(14, 96) = 2.34, p < .05$.

models were tested. All five models were identical, with one exception. The outcome variables used in the five models consisted of the five health outcomes identified in Hypotheses 2a–2e. Perceived support from family and friends and perceived support from blog readers were mean-centered prior to being included in each model (Cohen et al., 2003). All five models were constructed as follows: The five control variables (i.e., gender, age, education, estimated percentage of blog readers who were family and friends, and respondents' current health) were entered in the first block of the model. Perceived support from family and friends was entered in the second block, and perceived support from blog readers was entered in the third block of the model. The interaction between perceived support from family and friends and perceived support from blog readers was entered in the fourth and final block.

The results for all five regression models are depicted in Table 3. Perceived support from blog readers was associated with two of the five health outcomes. Blog reader support was positively associated with perceptions of personal growth and health self-efficacy. Respondents who reported greater perceptions of blog reader support reported greater health self-efficacy and personal growth. The finding regarding personal growth, however, is qualified by a significant interaction effect. There was a significant interaction between blog reader support and family and friend support for personal growth and loneliness. To interpret these two interactions, the associations between support from blog readers and both health outcomes were computed based on three different levels of support from family and friends (Cohen et al., 2003). Estimates were computed at one standard deviation above the mean for family and friend support, one standard deviation below the mean for family and friend support, and at the mean for family and friend support. The results for personal growth and loneliness are displayed in Figures 1 and 2, respectively. They indicate that the relationships between blog reader support and personal growth ($b = .42$, $t = 3.80$, $p < .05$) and loneliness ($b = -.33$, $t = -3.06$, $p < .05$) were significantly different from zero when family and friend support was relatively low. When family and friend support was relatively high, however, the relationships between blog reader support and personal growth ($b = .03$, $t = .25$, $p = .81$) and loneliness ($b = .01$, $t = .09$, $p = .92$) were not significantly different from zero. In sum, when family and friend support was relatively lacking, blog reader support was negatively associated with loneliness and positively associated with feelings of personal growth.

Overall, the results provide some evidence consistent with Hypotheses 2b and 2d. However, no support was found for Hypotheses 2a, 2c, and 2e. In regard to Research Questions 2a–2e, the results demonstrate that perceived support from family and friends moderates the relationships between blog reader support and both personal growth and loneliness. Consistent with the social compensation perspective, blog reader support was negatively associated with loneliness and positively associated with personal growth when support from family and friends was relatively lacking.

Table 3 Blog Reader Support and Family and Friend Support as Predictors of Health Outcomes

	Health self-efficacy			Social functioning			Purpose in life			Personal growth			Loneliness		
	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2	β	t	ΔR^2
Block 1: Control variables			.18*			.48			.13*			.10*			.06
Gender (female = 0)	-.18*	-1.96		.05	0.70		-.20	-2.19		-.15	-1.56		.17	1.73	
Age	.05	0.57		.02	0.31		.11	1.22		-.02	-0.19		-.02	-0.24	
Education	.15	1.72		.06	0.91		.24*	2.61		.11	1.15		-.002	-0.03	
Current health	.37*	4.15		.68*	9.64		.18*	1.98		.27*	2.93		-.01	-0.12	
Proportion of readers who were family and friends	.15	1.76		.07	0.95		.14	1.52		.07	0.78		-.16	-1.74	
Block 2: Blog reader support	.18*	1.98	.03*	.11	1.56	.01	.10	1.10	.01	.23*	2.45	.05*	-.13	-1.36	.02
Block 3: Family and friend support	.27*	3.21	.07*	.30*	4.53	.08*	.32*	3.63	.10*	.36*	4.20	.12*	-.66*	-9.03	.40*
Block 4: Blog reader support \times Family and friend support	-.13	-1.48	.02	.03	0.48	.001	-.09	-0.97	.01	-.23*	-2.61	.05*	.17*	2.29	.03*

* $p < .05$. All variables in Blocks 2–4 are mean-centered. Model summaries: health self efficacy, $F(8, 105) = 5.51$, $p < .05$, $R^2 = .30$; social functioning, $F(8, 105) = 17.47$, $p < .05$, $R^2 = .57$; purpose in life, $F(8, 105) = 4.19$, $p < .05$, $R^2 = .24$; personal growth, $F(8, 105) = 5.97$, $p < .05$, $R^2 = .31$; loneliness, $F(8, 105) = 13.19$, $p < .05$, $R^2 = .50$.

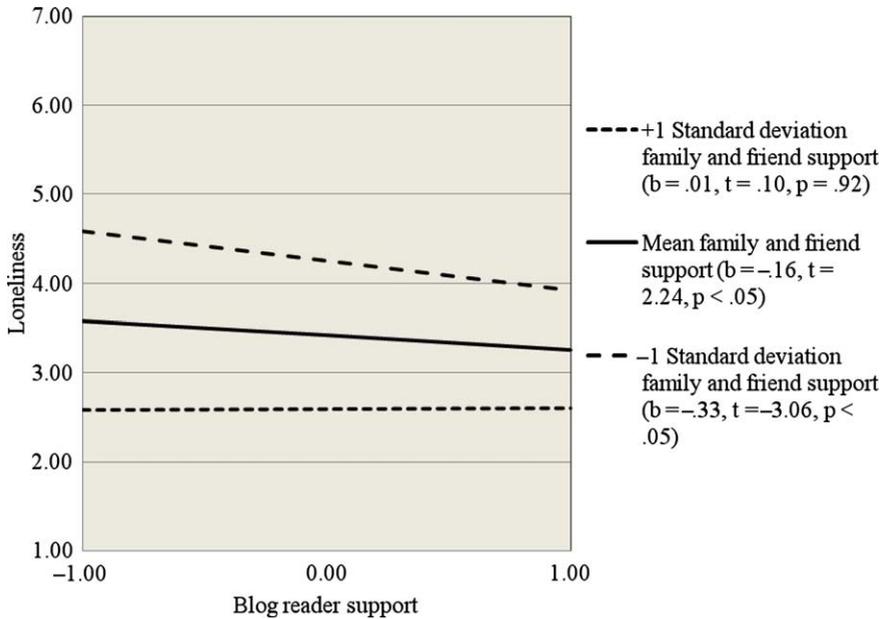


Figure 1 Family and friend support moderates the relationship between blog reader support and loneliness.

Blog Reader Support and Support from Family and Friends

Research Question 1 asks if there is an association between support from family and friends and blog reader support. A regression model was constructed to answer this research question with blog reader support serving as the outcome variable. The five

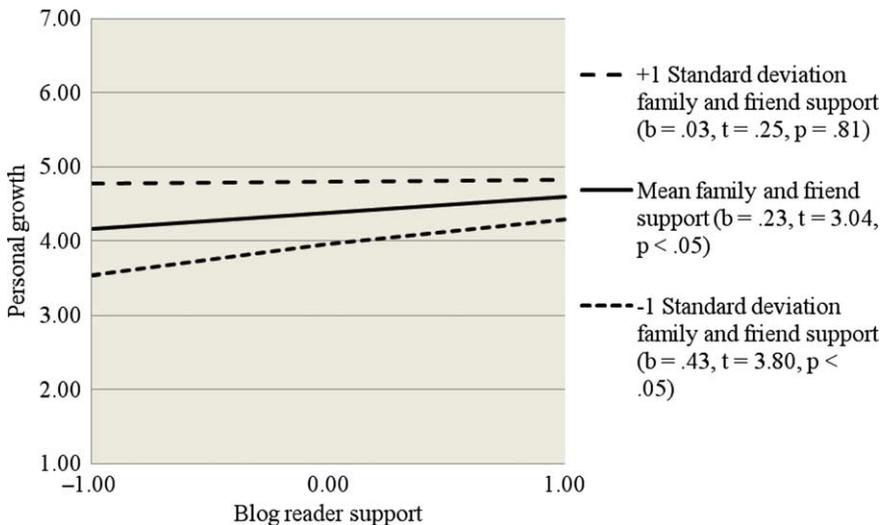


Figure 2 Family and friend support moderates the relationship between blog reader support and personal growth.

control variables were entered in the first block of the model, and perceived support from family and friends was entered in the second block. The relationship between blog reader support and family and friend support was not significant, $\beta = -.02$, $t = -.22$, $p = .83$.

Discussion

This project investigated the social dimension of blogging about one's experience with a health condition. The results provide evidence that health blogging is related to perceived social support from blog readers and that blog reader support is associated with measures of bloggers' well-being. Further, the availability of support in bloggers' strong-tie relationships with family and friends moderated the relationship between blog reader support and two measures of bloggers' well-being. In the following paragraphs, these findings will be discussed and their implications for research and theorizing about new communication technologies, social support, and health communication will be considered.

Blogging, Social Support, and Well-being

There is some evidence to suggest that blogging about a health condition may be a means of marshalling social support from blog readers. Blogging frequency, which involves the total number of posts made by respondents in the 42 days prior to completing the questionnaire, was positively associated with perceived blog reader support. Respondents who blogged more frequently reported greater levels of support available from blog readers. The results also underscore the social nature of blogging demonstrated in prior research (Stefanone & Jang, 2008) and show that reader feedback is an important component of health blogging. The proportion of posts with at least one reader comment was positively associated with perceived blog reader support.

In addition to demonstrating that health blogging is a means of acquiring social support, the results offer some evidence that blog reader support is consequential for bloggers' well-being. Blog reader support was positively associated with bloggers' perceptions of health self-efficacy. The information and empathy bloggers received from readers may have encouraged them to feel more confident in their ability to manage their health condition. Blog reader support was also associated with bloggers' perceptions of social functioning, but this relationship was qualified by a significant two-way interaction involving family and friend support.

At a broader level, the results of this study offer insights about the implications of communication technologies for supportive communication. Blogs represent a novel resource for acquiring social support. Blogging involves broadcasting one's concerns in a format that is public and mediated. The data from this study suggest that blogging makes it possible to reinforce connections with strong ties. Indeed, for some individuals, a key benefit of blogging may be reinforcing existing strong-tie relationships. One-third of bloggers estimated that 25% or more of their readers were

family or friends. Granted that family and friend support was associated with all five of the health outcomes related to well-being, maintaining or reinforcing strong-tie connections may have important consequences for some health bloggers. For a majority of bloggers in the sample, however, blog readers are a support resource that is distinct from bloggers' family and friends. Similar to computer-mediated support groups (Tanis, 2008; Wright & Bell, 2003; Wright et al., 2010), the public nature of blogging makes it possible for bloggers to gain access to weak ties. Two-thirds of bloggers in the sample estimated that less than 25% of their readers consisted of family or friends. Moreover, the relationship between blog reader support and family and friend support was not statistically significant. Although blogging might make it possible for a relatively small portion of health bloggers to reinforce connections with family and friends, a more general outcome of blogging is increasing bloggers' access to unique support resources and extending their support network.

Blogging is also a novel resource for support because it is computer mediated. Technical and normative dimensions of blogs may help bloggers and readers manage some of the facework dilemmas inherent in acquiring and providing support that have been identified in prior research (Goldsmith, 1992, 1994). Blogs allow asynchronous communication and filter many of the social cues that are present in face-to-face interaction. The genre of blogging also makes appropriate and invites extended self disclosure from a single person over time (Herring et al., 2004; Qian & Scott, 2007; Sundar et al., 2007). The results of this study provide evidence consistent with the idea that blogging may serve to facilitate supportive communication. Bloggers in the sample were fairly active during the 42 day period, writing approximately 17 total posts with a mean of approximately 475 words per post. The number of posts made by bloggers was positively associated with perceived blog reader support. These results suggest that bloggers felt relatively comfortable sharing their health experiences in their blog and were able to construct messages that prompted support from blog readers. Further, the proportion of blog posts with at least one reader response was positively associated with perceived support from blog readers. It appears that readers were able to construct supportive messages in the form of comments posted to blogs that encouraged bloggers to feel a greater sense of information and emotional support.

Support from Family and Friends Moderates the Relationship between Blog Reader Support and Outcomes Related to Well-being

The findings from this study also demonstrate that the availability of support from strong ties has implications for outcomes related to bloggers' well-being. Family and friend support moderated the relationships between blog reader support and both loneliness and personal growth. Both interactions were consistent with the social compensation perspective (Kraut et al., 2002). When family and friend support was relatively lacking, blog reader support was negatively associated with loneliness and positively associated with personal growth. When family and friend

support was available, the relationships between blog reader support and these two outcomes were not significant. Health blogging appears to present an opportunity for individuals lacking support from their strong ties to access support resources and bolster their well-being. Given the body of research linking social support with positive health outcomes related to physiological functioning (Uchino, 2004) and psychosocial well-being (Smith et al., 1994), the potential for health blogging to help individuals overcome deficits in support from their family and friends is noteworthy. Health blogging stands to benefit those individuals most in need of support.

The findings consistent with the social compensation perspective have several implications. These results offer insight into the interrelationship between strong and weak ties in the context of social support. Wright and Miller (2010) contend that, in some instances, strong ties may be unable or unwilling to provide effective support. Weak ties are cast as an alternative to strong ties. Beyond being an alternative, the results of this study suggest that weak ties may be most important when support from strong ties is unavailable. Although blog readers may be comprised of strong and weak ties, bloggers in the sample estimated that a majority of their readers could be considered weak ties. For scholars and practitioners developing health interventions aimed at facilitating social support, the results consistent with the social compensation perspective suggest some situations in which health blogging might be a valuable tool. In instances where strong-tie support networks are systematically unavailable, communication technologies such as blogging might be particularly useful. For example, individuals with stigmatized health conditions such as HIV or AIDS may face difficulties acquiring support from their family members (Peterson, 2010). Communication technologies such as blogging might make it possible to increase the accessibility of weak ties and provide opportunities for acquiring social support and the commensurate benefits of supportive communication. Finally, the results add to the broader body of research examining the social enhancement and social compensation perspectives. Although relatively few studies have focused specifically on outcomes related to well-being and health (e.g., Bessiere et al., 2008; Kraut et al., 2002), prior research has reported findings consistent with the social compensation perspective. Bessiere et al. (2008) found that, of those who used the Internet to meet new people, individuals with smaller social networks and less perceived support did not report as much of an increase in depression across two measurement points as did individuals who had larger social networks and greater levels of perceived support. The present study extends research on social compensation to the realm of blogging and health-related Internet use and provides evidence that, through using Internet-based communication technologies, those poor in support resources may improve their well-being.

None of the tests examining support from family and friends as a moderator of the relationships between health blogging and perceived support from blog readers were significant. Although previous research investigating Internet use to improve social connections has reported evidence consistent with the social enhancement perspective (Kraut et al., 2002; Lee, 2009), those studies examined communication-related

Internet use broadly. The findings from this study suggest that support from blog readers acquired from health blogging is not dependent upon existing strong-tie relationships. It may be that, in the context of health blogging, those who have and lack family and friend support equally benefit in terms of acquiring blog reader support.

Limitations

In evaluating the results, three limitations of this project warrant consideration. First, the sample used in this study was largely comprised of dedicated bloggers writing public blogs. The blogs examined in this project had been in existence for a mean of almost two years and respondents made a blog post approximately once every two days during the six weeks prior to completing the study questionnaire. Further, all of the blogs in the sample were public in that they were not password protected. It is unclear whether the outcomes from this study would generalize to novice bloggers or people who write a private blog. Second, the sample included individuals coping with a range of serious health conditions. Although including a diverse sample increases the generalizability of the findings, it also seems possible that there may be differences in respondents' support needs based on the nature of their illness that could influence the support-related outcomes of blogging. Third, as previously noted, the variables assessing blog reader support and support from family and friends are not independent. Ratings of blog reader support could presumably include the support perceived from family members and friends who read the blog.² To account for this possibility, the proportion of blog readers who were family and friends was included as a control variable in all analyses.

Directions for Future Research

The results of this project suggest several possible directions for future scholarship. First, it would be worthwhile to further explore the social dimension of blogging by considering the implications of reader comments. A mean of approximately two comments from unique readers were included per blog post examined in this study. Future research might consider the role of such comments in bloggers' experiences of their illness. Reader comments may be particularly instrumental in subsequent blog posts and the narrative bloggers are constructing about their health and health conditions. Second, it is important to consider the journaling component of blogging. Research examining the therapeutic benefits of writing about important life events underscores the value of expressing one's experiences in writing (for a review, see Pennebaker & Chung, 2007). Although there are key differences between the expressive writing paradigm and blogging, it seems possible that some of the health benefits of expressive writing might extend to blogging. Future research might also explore the use of and outcomes associated with particular forms of expression such as insightful self disclosure (Shaw, Hawkins, McTavish, Pingree, & Gustafson, 2006).

Conclusion

This project extends the tradition of research examining the use of communication technologies for acquiring social support to the domain of health blogging. The results underscore the social significance of blogging about one's experiences with a health condition. Health blogging was related to perceived social support from blog readers. Moreover, blog reader support was particularly critical to the well-being of individuals lacking support from their strong-tie relationships. Although the findings suggest that health blogging may have promise as a means for acquiring social support and the attendant health benefits of supportive communication, future research is necessary to more fully understand the social dimension of health blogging related to social support and, more generally, the implications of new communication technologies for health communication.

Notes

- [1] Two of the respondents met the criteria for inclusion in the project at the time the blog search was conducted to identify the sample. However, they did not make a blog post during the 42 days prior to completing the questionnaire. These two participants were retained in the sample because they have a history of active health blogging that is generally consistent with remaining bloggers in the sample.
- [2] Although it would have been possible to separate completely these two sources, we believe that the limitations of doing so outweigh the benefits. In practice, blog readers are a unique support resource because they may be comprised of both strong and weak ties that intersect bloggers' offline and online social networks. Asking bloggers to distinguish and evaluate the support they receive from blog readers who are and are not family and friends creates an artificial distinction that would undermine any global evaluation of blog readers as a support resource. Moreover, asking respondents to rate support available from these two types of blog readers would have required increasing the length and apparent redundancy of the questionnaire and, ultimately, creating additional barriers to participation among a reasonably difficult population to sample.

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