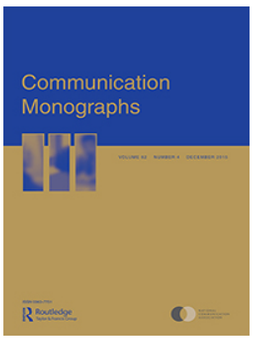

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Communicating Social Support in Computer-mediated Contexts: A Meta-analytic Review of Content Analyses Examining Support Messages Shared Online among Individuals Coping with Illness

Stephen A. Rains, Emily B. Peterson & Kevin B. Wright

Research on social support during the past two decades has been marked by a growth in scholarship examining supportive communication in computer-mediated contexts among individuals coping with illness. In an effort to summarize and advance this body of research, a meta-analytic review of content analyses was conducted. Across the 41 content analyses examining social support messages shared in health-related contexts online, informational and emotional support messages were most prevalent. Additionally, the prevalence of particular types of support messages varied based on several stressor dimensions relevant to illness. Nurturant forms of support were more common among content analyses examining health conditions likely to threaten personal relationships as well as among content analyses focusing on health conditions with a greater potential for loss in the form of death. Action-facilitating types of support were more common among content analyses examining more chronic conditions. The findings from this project offer insights about the nuanced ways in which computer-mediated communication is used as a resource for coping with illness.

Keywords: Computer-mediated Support

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Social support is an integral resource for coping with illness, promoting both physical functioning (Uchino, 2004) and psychosocial well-being (Smith, Fernengel, Holcroft, Gerald, & Marien, 1994). During the past two decades, researchers have become increasingly interested in exploring the implications of computer-mediated communication for social support processes (for a review, see Wright, Johnson, Averbeck, & Bernard, 2011). Online support communities, blogs, microblogs, social network sites, and even email can make it possible to mobilize social support resources online in ways that supplement or sometimes replace traditional offline support networks (Rains & Keating, 2011; Turner, Grube, & Meyers, 2001). Moreover, there is evidence that computer-mediated support resources are widely used. A survey by the National Cancer Institute (2012) indicated that 7.5 million American adults ventured online to acquire peer support about a health issue during 2012.

The central role that social support can play in coping with illness and the significant number of people seeking support online make it essential for scholars to develop a complete understanding of computer-mediated support processes. One important issue involves how social support is communicated online. Because interactions are typically text-based and lack many nonverbal cues present in face-to-face interaction (Tanis, 2008; Wright & Bell, 2003), the explicit support messages shared may be particularly critical. Indeed, a number of content analyses have been conducted to examine the nature of support messages communicated in computer-mediated contexts such as online communities (Keating, 2013), blogs (Tong, Heinemann-LaFave, Jeon, Kolodziej-Smith, & Warshay, 2013), and social network sites (Ashley, 2012). Many of these studies rely on Cutrona and Suhr's (1992) social support behavior code (SSBC) or a commensurate coding scheme and examine the prevalence of informational, emotional, esteem, network, and/or tangible support messages. Although there appear to be some trends across these studies, there are also several noteworthy inconsistencies. Some scholars have reported that emotional support was the most frequent type of support message (Braithwaite, Waldron, & Finn, 1999; Buis, 2008), whereas others have found that informational support (Coursaris & Liu, 2009; Gray, 2013) or network support (Ashley, 2012) was most common. Perhaps more important, questions about when and why social support messages in computer-mediated contexts vary systematically remain largely unanswered.

In an effort to summarize and advance the existing body of research on computer-mediated support, a meta-analytic review was conducted examining content analyses of support expression in computer-mediated contexts among individuals coping with illness. The optimal matching model (Cutrona, 1990; Cutrona & Russell, 1990) was used as a framework to investigate when and why specific types of support messages are more or less prevalent. The results of this project can advance research on computer-mediated support in several important ways. First, by aggregating the results of existing content analyses, it is possible to reconcile inconsistent findings and identify more robust estimates regarding the prevalence of different types of support messages. Better understanding the broader patterns of support expression within these contexts would offer valuable insights about how computer-mediated

communication is being used as a coping resource. Second, the results of this project will make it possible to identify when and why particular types of support messages are more or less likely to be shared. Such information would inform theory-building efforts about supportive communication both online and offline. By isolating stressors associated with health conditions that make particular types of support more likely, it is possible to understand more fully the mechanisms through which supportive communication aids in coping with illness. In the following sections, we review previous work on social support and computer-mediated communication to provide a foundation for the study hypotheses and research questions.

Literature Review

Online Social Support for Individuals Facing Health Concerns

Researchers have known for many years that social support is related to a variety of positive health outcomes (Barrera, 1986; Schaefer, Coyne, & Lazarus, 1981). Although much of the early support research was conducted in the context of face-to-face interactions, more recent studies have shown that such benefits extend to social support acquired online (Rains & Young, 2009; Wright & Bell, 2003). The utility of computer-mediated support has been demonstrated in a variety of contexts ranging from online communities (e.g., Lieberman & Goldstein, 2006) to blogs (e.g., Sanford, 2010). In one recent study, for example, Turner and colleagues (2013) found that the frequency of emotional support messages received by diabetic patients in emails from their health-care provider was associated with improvements in patients' glycemic control.

Yet, computer-mediated contexts are unique in several ways that have important implications for support processes and outcomes. First, online support contexts make it possible for support seekers to gain access to others who share similar health experiences (Tanis, 2008; Walther & Boyd, 2002; Wright, 2002). Recently diagnosed pancreatic cancer patients, for example, can find online support communities, social network site groups, blogs, and even email listservs dedicated specifically to this condition. Because the participants in these various support contexts are coping with the same illness and likely share similar experiences, they can serve as weak ties who are particularly well-positioned to offer empathy and advice (Wright & Miller, 2010; Wright & Rains, 2013). Support seekers are likely to locate individuals who will provide them with the type of support that facilitates their preferred coping style (Turner et al., 2001). Second, supportive interactions online are predominately text-based (Tanis, 2008). Nonverbal cues that are available in face-to-face interaction, such as eye contact and facial expressions, are reduced or completely absent in computer-mediated contexts. Walther and Parks (2002, p. 545) refer to the reduction in social cues as among the most critical "structural aspects of social support" that are "fundamentally changed" by computer-mediated communication. This reduction in social cues effectively privileges written discourse—and, in particular, the explicit support messages shared during interaction.

Enacted Support and Support Message Types

Within the broader tradition of research on social support, enacted support—involving "specific lines of communication behavior enacted with the intent of benefitting or helping another" (Burleson & MacGeorge, 2002, p. 306)—has been an important topic of study (for a review, see MacGeorge, Feng, & Burleson, 2011). Enacted support is typically conceptualized as a multidimensional construct. Several typologies have been developed to identify different categories of support messages (e.g., Cobb, 1979; Schaefer, Coyne, & Lazarus, 1981). Drawing from previous typologies, Cutrona and Russell (1990) consider five types of support messages as part of the optimal matching model (also see Cutrona, 1990): informational, emotional, network, esteem, and tangible. These classes of support message were operationally defined by Cutrona and Suhr (1992) in their SSBC coding scheme. Emotional support messages involve expressions of physical affection, empathy, and encouragement, whereas informational support is characterized by messages that provide facts, guidance, or advice. Esteem support involves compliments and expressions of agreement with a support seekers' perspective, and network support includes attempts to expand a support seekers' connections or reinforces existing connections. Tangible support involves offers of physical or monetary assistance.

Since the late 1990s, a steady stream of studies have been published that used Cutrona and Suhr's (1992) SSBC or a commensurate coding scheme to examine the prevalence of support messages shared in health-related computer-mediated contexts. In one of the first such studies, Braithwaite and colleagues (1999) conducted a content analysis of support messages shared in an email listserv for people coping with physical disabilities. They used the SSBC and found that informational and emotional support were the two most common types of support messages shared and the other three types were much less common. Although more recent research has also shown that informational support and emotional support are more prevalent than other support types (e.g., Eichhorn, 2008; Fukkink, 2011; Mo & Coulson, 2008), there are a number of inconsistencies across this body of research. Some content analyses have shown that informational support was more prevalent than emotional support messages (Gray, 2013; Keating, 2013; Loane & D'Alessandro, 2013), whereas others have reported the opposite finding (Love et al., 2012; Malik & Coulson, 2011; Tong et al., 2013). Still other content analyses have shown that esteem (Ashley, 2012; Fukkink, 2011) and network support (Coulson, Buchanan, & Aubeeluck, 2007; Loane & D'Alessandro, 2013) are as prevalent, or more so, than informational or emotional support messages.

One objective of this project is to examine the prevalence of different types of social support messages shared in health-related online settings. Conducting a meta-analysis of existing published and unpublished content analyses makes it possible to reconcile the inconsistent findings reported in previous research and offer a more robust understanding of how social support is enacted in computer-mediated contexts. The results of a meta-analytic review would offer a clearer picture of the prevalence of different types of support messages and, as a result, provide insights

about the nature of supportive communication online. Given the inconsistencies among prior content analyses, we pose the following research question:

> RQ1: Which types of social support messages are most common in health-related computer-mediated contexts?

Variation in Supportive Messages in Computer-Mediated Contexts

A second objective of this project is to examine when and why specific types of support messages are more or less prevalent in computer-mediated contexts. In conceptualizing social support as a multidimensional construct, the optimal matching model (Cutrona, 1990; Cutrona & Russell, 1990) builds from prior research on support matching (e.g., Thoits, 1986) and assumes that some types of support may be more or less beneficial under certain circumstances. Cutrona and colleagues (Cutrona & Russell, 1990; Cutrona & Suhr, 1992) group the five types of support messages (i.e., informational, emotional, etc.) into two broad categories based on research regarding coping styles (Lazarus & Folkman, 1984). *Action-facilitating* types of support, which include informational and tangible support, foster behavior designed to mitigate a stressor. *Nurturant* support, which includes emotional, network, and esteem support, helps individuals cope with the emotional consequences of a stressor. Four dimensions are argued to distinguish stressors in the optimal matching model and make action-facilitating and nurturant support messages more or less beneficial (Cutrona & Russell, 1990; Cutrona & Suhr, 1992): desirability, controllability, life domain, and duration of consequences.

Although the optimal matching model (Cutrona & Russell, 1990; Cutrona & Suhr, 1992) was developed to make predictions about the effectiveness of particular types of support messages based on a given stressor characteristic, it also offers a useful theoretical framework from which to examine when and why some types of support messages may be more or less prevalent in computer-mediated contexts (Green-Hamann & Sherblom, 2014). The dimensions of stressors identified in the optimal matching model may make particular needs salient among support seekers. Attempts to meet those needs by support providers should be reflected in the prevalence of particular types of support messages. Accordingly, trends may exist in the types of support messages shared in computer-mediated contexts based on specific dimensions of stressors relevant to illness. Because the five dimensions of stressors developed in the optimal matching model were originally intended to apply to a range of life events—including illness (Cutrona & Russell, 1990)—we have adapted each dimension specifically to the context of illness. The degree to which the health conditions serving as the focus for existing content analyses make certain stressor characteristics more or less salient could explain when and why specific types of support messages have been found to be more or less common in previous research.

Much of the theorizing about the optimal matching model has focused on the controllability of a stressor (Cutrona & Russell, 1990; Cutrona & Suhr, 1992).

Uncontrollable stressors are those in which an individual has relatively little potential to avoid the event or mitigate its consequences. Action-facilitating types of support (i.e., information and tangible) are proposed by Cutrona and colleagues to be more useful for a controllable stressor. Action-facilitating support can help the receiver engage in behavior that will address the stressor or its consequences. Although it is beyond the scope of this project to evaluate the effectiveness of various types of support, the arguments made in the optimal matching model about the benefits of support matching extend to the prevalence of action-facilitating and nurturant support. Because it is particularly likely to address the specific needs of support seekers, action-facilitating support should be more prevalent in content analyses that examined health conditions marked by relatively higher levels of controllability. To be clear, it is not being argued here or in the optimal matching model that other types of support are not helpful or uncommon when a condition is controllable. Rather, action-facilitating types of support are proposed in this study to be *more prevalent* among those prior content analyses examining conditions that are more controllable:

> H1: Action-facilitating types of support are more common in content analyses examining health conditions that are more controllable than in content analyses examining less-controllable conditions.

A second dimension of stressors considered in the optimal matching model involves the domain of one's life that is affected (Cutrona, 1990; Cutrona & Russell, 1990). One life domain particularly relevant to illness is one's personal and professional relationships. Indeed, prior research has demonstrated the utility of computer-mediated resources when one's close ties are unable or unwilling to serve as an effective support resource (Rains & Keating, 2011; Wright & Miller, 2010). Cutrona and Russell (1990) posit that some types of support messages may be more helpful in stressful circumstances impacting personal relationships. In particular, when one's relationships are threatened or lost due to a stressor, nurturant support should be particularly valuable as a means of offsetting aversive emotional responses and foster a sense of connection (Cutrona, 1990). Nurturant support is helpful to mitigate or overcome the threat to one's relationships. We expect that the prediction made in the optimal matching model should extend to the prevalence of support messages. Nurturant support should be more prevalent in content analyses dedicated to health conditions that have a greater impact on personal and professional relationships than among content analyses examining conditions that have less of an impact on relationships:

> H2: Nurturant types of support are more common in content analyses examining health conditions that are more likely to impact personal relationships than in content analyses examining conditions that have less of an impact on one's personal relationships.

Desirability and duration are two final dimensions of stressors considered in the optimal matching model (Cutrona & Russell, 1990). Desirability involves the degree to which a stressor has the potential to result in gain or loss (Cutrona & Russell, 1990), whereas duration involves the length of the stressor in time. In the context of illness, we conceptualized desirability in terms of the potential to result in death and duration as the degree to which an illness is relatively chronic or acute. Although these two dimensions of stressors do not receive a great deal of attention in terms of their implications for optimal matching (Cutrona, 1990; Cutrona & Russell, 1990), related work on socio-emotional selectivity theory offers a solid foundation from which to make predictions. Socio-emotional selectivity theory (Carstensen, 1995; Lockenhoff & Carstensen, 2004) posits that illness is one factor that can influence one's perceptions of time and, consequently, one's needs and behavior. Lockenhoff and Carstensen (2004) argue that when the future is perceived as largely open-ended, there is a premium on acquiring information, not only for its immediate relevance but also for its potential future payoff. Perceptions of limited time, however, shift motivational priorities in such a way that the regulation of emotional states becomes more important than other types of goals.

Socio-emotional selectivity theory (Carstensen, 1995) suggests that nurturant types of support should be more prevalent among individuals coping with a potentially terminal illness than illnesses that are not likely to result in death. Lockenhoff and Carstensen (2004, p. 1396) explain that, "When life time is limited, younger and older people alike pay more attention to the emotional aspects of situations [and] prioritize emotion-focused over problem-focused coping strategies". Indeed, Kausar and Akram (1998) found that patients with terminal cancer were more likely than patients with non-terminal diseases to use emotion-focused coping strategies. The tendency toward emotion-focused coping strategies when time is short should result in nurturant forms of support being more prevalent in support contexts involving illnesses with a greater potential for death. It also seems possible that the degree to which an illness is relatively more chronic or acute could influence support seekers' time perspective and, consequently, the prevalence of different types of support messages. Chronic illness might tend to be viewed as more opened ended and, relative to more acute conditions, encourage problem-focused coping that would require action-facilitating forms of support. Taken together, the preceding argument suggests that, drawing from socio-emotional selectivity theory (Carstensen, 1995), nurturant types of support should be more prevalent among content analyses examining health conditions that have a relatively greater potential for loss and action-facilitating support should be more common among content analyses examining more chronic health conditions:

> H3: Nurturant types of support are more common in content analyses examining health conditions with a greater potential for loss in the form of death than in content analyses examining conditions than have less potential for loss.
>
> H4: Action-facilitating types of support are more common in content analyses examining health conditions that are more likely to be chronic or longer-term

> than in content analyses examining conditions that are more likely to be acute or shorter-term.

Although not explicitly addressed in the optimal matching model (Cutrona, 1990; Cutrona & Russell, 1990), a final dimension of stressors in the context of illness that warrants consideration is stigma. Goffman (1963) conceptualized stigma as a mark of discredit recognizable by a social group. Stigma is not an objective feature of any one illness (Smith, 2011), but is associated with the experience of a range of health conditions (Scambler, 2009; Van Brakel, 2006). Stigma is inherently social in that it involves disapproval from others and has direct consequences for self-evaluations among those who possess it (Berger, Ferrans, & Lashley, 2001; Scambler, 2009). Stigma can result in rejection by members of one's existing social network (Vanable, Carey, Blair, & Littlewood, 2006) and make acquiring social support difficult (Mickelson, 2001). Indeed, at least two recent meta-analyses have reported a negative association between stigma and social support (Livingston & Boyd, 2010; Smith, Rossetto, & Peterson, 2008). Considered together, the previous research suggests that stigma may make nurturant forms of support particularly important. Forms of nurturant support such as emotional and esteem support messages may help buffer threats to one's sense of self that can accompany a health condition in which the potential for stigma is high. As such, it is predicted that nurturant support will be more prevalent among content analyses examining health conditions where the potential for stigma is greater:

> H5: Nurturant types of support are more common in content analyses examining health conditions where the potential for stigma is relatively higher than in content analyses examining conditions where the potential for stigma is relatively lower.

Method

A meta-analytic review was conducted to test the hypotheses and answer the research question. Meta-analysis involves a quantitative summary of a body of research (Borenstein, Hedges, Higgins, & Rothstein, 2011; Hunter, Schmidt, & Jackson, 1982). Although meta-analysis typically involves aggregating effect estimates reflecting the strength of the relationship between two variables (Borenstein et al., 2011; Hedges & Olkin, 1985), the data examined in this project were extracted from content analyses of social support messages shared in computer-mediated contexts. Because a majority of the content analyses were conducted using Cutrona and Suhr's (1992) SSBC or an equivalent coding scheme, it was possible to aggregate the findings across studies and conduct formal tests to address the hypotheses and research question.

Literature Search

The literature search was completed in two steps. First, a general search was conducted in an effort to identify published and unpublished empirical research reports related to social support and computer-mediated communication completed

prior to 2014. The term "social support" was used along with "computer-mediated communication", "online", or "Internet" to search four sets of databases. Within the EbscoHost database, *Academic Search Complete*, *Communication and Mass Media Complete*, *ERIC*, *Medline*, *PsycArticles* and *PsycInfo* were examined to identify published research. Additionally, All Academic was searched to identify conference papers and ProQuest was used to identify relevant doctoral dissertation and masters theses. Google scholar was the final database examined for this project. The first 100 results were reviewed to identify any additional research reports not located in the previous searches. The results of each search were first reviewed by one of the authors to identify empirical research reports generally related to social support and computer-mediated communication. The support-related research reports were then further reviewed by all three authors to identify content analyses of support messages shared in computer-mediated contexts (e.g., online communities, blogs or social network sites).

A second, more focused search was then conducted by one of the authors. The same four databases were searched using the following two search phrases: "'social support' and 'content analysis' and Internet" and "'self help' and 'content analysis' and Internet". The results were reviewed in an effort to identify any additional content analyses not located in the first search. Together, the two procedures resulted in the identification of approximately 75 reports containing content analyses related to social support and computer-mediated communication.

Operationalizing Study Variables

Health-related support. Because this project focuses specifically on health-related computer-mediated support, the research reports were first reviewed to ensure that they examined communication among individuals experiencing or concerned about one or more health issues. Health was defined broadly in this project to include both mental and physical conditions. Research reports were excluded from the sample if they addressed social support in educational (Harrington, 2010) or other non-health contexts such as parenting (Craig & Johnson, 2011; Dunham et al., 1998) and the everyday lives of the lay public (Ko, Wang, & Xu, 2013), or if the support messages were created by organizations (Arbogast, 2013). Reports were also excluded when the coding scheme used was incompatible with Cutrona and Suhr's (1992) SSBC (Amsbary & Powell, 2012; Ignatow, 2009) or the frequencies of different types of support message were not reported (Coulson, 2005; Elwell, Grogan, & Coulson, 2011; Hwang et al., 2010; Sherman & Greenfield, 2013). A total of 41 research reports detailing a content analysis of support messages shared in health-related online settings were included in the sample. Table 1 includes descriptive information about each report.

Social support message types. A majority of the reports in the sample (n = 24; 59%) used some or all of Cutrona and Suhr's (1992) SSBC as a framework for conducting the content-analysis of support messages. As previously discussed, Cutrona and

Table 1 Descriptive information for all research reports in the sample.

Research report	Informational *n*/Prop$_{std}$	Emotional *n*/Prop$_{std}$	Tangible *n*/Prop$_{std}$	Esteem *n*/Prop$_{std}$	Network *n*/Prop$_{std}$	Health condition(s)
Alexander (2002)*	13,459/.11	14,338/.14	–	2,763/−.24	–	Multiple (ADD, anxiety, breast cancer, depression, diabetes, eating disorder, fibromyalgia, MS)
Ashley (2012)*	23/.00	3/−.29	–	44/.30	–	Smoking cessation
Bjornsdottir (1999)	29/.03	47/.25	4/−.28	–	–	Heart disease
Blank, Schmidt, Vangsness, Monteiro, and Santagata (2010)	1,097/−.05	1,360/.05	–	–	–	Breast & prostate cancer
Braithwaite et al. (1999)	461/.11	590/.20	41/−.17	275/−.01	105/−.13	Physical disabilities
Buis (2007)	680/.15	369/−.15	–	–	–	Multiple (celiac, epilepsy, muscular dystrophy)
Buis (2008)	64/−.30	262/.30	–	–	–	Hospice
Buis and Whitten (2011)	1,190/−.10	1,783/.10	–	–	–	Multiple types of cancer
Coulson, Buchanan, and Aubeeluck (2007)	730/.10	674/.08	127/−.15	282/−.08	629/.06	Huntington's disease
Coursaris and Liu (2009)	1,458/.34	646/.04	27/−.19	294/−.09	260/−.10	HIV/AIDS
Cowie, Hill, and Robinson (2011)	470/−.27	1,562/.27	–	–	–	Breastfeeding
Eichhorn (2008)	81/.10	76/.08	32/−.08	26/−.10	58/.01	Eating disorder
Evans, Donelle, and Hume-Loveland (2012)	192/.04	213/.08	107/−.12	–	–	Depression
Finn (1999)	110/−.08	153/.08	–	–	–	Disabilities
Frohlich and Zmyslinski-Seelig (2012)	4,307/.30	1,093/−.30	–	–	–	Inflammatory bowel disease (IBD)
Fukkink (2011)	407/.13	412/.13	77/−.14	319/.05	36/−.17	Multiple (unspecified)
Ginossar (2008)	920/.35	160/−.35	–	–	–	Lung cancer & leukemia
Gooden and Winefield (2007)	970/.12	583/−.12	–	–	–	–
Gray (2013)	299/.41	56/−.09	44/−.11	41/−.12	47/−.10	Breastfeeding
Hether (2009)*	1,513/.34	1,140/.21	0/−.20	79/−.17	79/−.17	Pregnancy
Hoffman-Goetz and Donelle (2007)	31/.02	45/.18	11/−.21	–	–	Multiple (unspecified)
Huang (2013)*	683/.37	228/−.04	–	132/−.13	62/−.19	Breast & prostate cancer
Imbesi (2010)	211/.08	151/−.08	–	–	–	Breast, prostate, & lung cancer
Keating (2013)	1,277/.14	705/−.07	–	–	692/−.07	Depression

Table 1 (*Continued*)

Research report	Informational n/Prop$_{std}$	Emotional n/Prop$_{std}$	Tangible n/Prop$_{std}$	Esteem n/Prop$_{std}$	Network n/Prop$_{std}$	Health condition(s)
Loane and D'Alessandro (2013)	214/.19	85/−.04	2/−.20	69/−.07	177/.12	Amyotrophic lateral sclerosis (ALS)
Love et al. (2012)	128/−.01	221/.23	–	41/−.23	–	Cancer
Malik and Coulson (2010)	558/−.24	1,591/.24	–	–	–	Infertility
Malik and Coulson (2011)	449/.18	215/−.18	–	–	–	IBD
Meier (1999)	35/−.33	174/.33	–	–	–	Occupational stress
Mo and Coulson (2008)	466/.25	369/.15	10/−.19	130/−.08	72/−.13	HIV/AIDS
Oprescu (2009)*	371/.13	382/.14	68/−.14	228/.00	90/−.12	Clubfoot
Paal (2013)*	398/.31	168/.02	35/−.15	92/−.08	82/−.09	Bereavement
Qian and Mao (2010)	202/.44	56/−.02	28/−.11	7/−.18	21/−.13	Pregnancy
Robinson, Turner, Levine, and Tian (2011)	1,345/.22	464/−.06	402/−.08	431/−.07	577/−.02	Diabetes
Shoham and Heber (2012)	1,051/.66	13/−.19	36/−.17	106/−.11	14/−.19	Hearing impairments
Sugimoto (2011)	91/−.18	507/.51	2/−.33	–	–	Depression
Taylor (2012)	255/.17	255/.17	10/−.19	121/−.02	47/−.13	Domestic violence
Tong et al. (2013)	70/−.04	260/.40	10/−.18	90/.01	3/−.19	Eating disorder
Turner-McGrievy and Tate (2013)	1,981/.61	263/−.09	7/−.20	171/−.13	14/−.19	Weight loss
van Uden-Kraan et al. (2008)	657/.10	446/−.10	–	–	–	Multiple (breast cancer, fibromyalgia, arthritis)
Winzelberg (1997)	69/.09	48/−.09	–	–	–	Eating disorder

Notes: *Indicates an unpublished report. n = raw frequency for a given type of message. Prop$_{std}$ = standardized proportion of messages appearing within a report relative to chance (see the results section for additional details). A dash ("–") indicates that the type of support was not evaluated in the report.

Suhr's (1992) coding scheme involves five macro-categories of supportive messages: informational, emotional, esteem, tangible, and network. The remaining reports used coding schemes developed by other researchers such as House and Kahn (1985; e.g., Bjornsdottir, 1999) or Klemm, Reppert, and Visich (1998; e.g., Hoffman-Goetz & Donelle, 2007), or involved coding schemes developed by the report author(s) (e.g., Ginossar, 2008). Reports that involved alternate coding schemes were included in the sample when two or more of the categories of support messages were commensurate with the categories in Cutrona and Suhr's (1992) framework. In most cases, it was possible to extract only those support messages used in providing social support. However, messages requesting specific types of support appear to have been consolidated with support provision messages in a few studies (e.g., Love et al., 2012; Qian & Mao, 2010).

Optimal matching variables. Five variables were examined to evaluate the dimensions of stressors discussed in the optimal matching model (Cutrona & Russell, 1990). Each of the variables was tailored specifically to the context of health. To evaluate desirability, the potential for *loss* in the form of death was assessed. *Controllability* was evaluated by considering the degree to which an individual experiencing the health issue could take action beyond taking medication to affect his or her situation. *Duration* was assessed by considering the degree to which the condition is long-term/chronic, in which the bulk of the effects and aftereffects persist for long periods of time, or short term/acute, in which the bulk of effects and aftereffects are limited or marked by briefer episodes. Life domain was evaluated by focusing specifically on the degree to which the condition affects the afflicted person's *personal relationships* with friends, family, and/or co-workers. *Stigma* was assessed by considering how likely the possession of a condition is to be marked by stigma.

All but two of the research reports in the sample (Fukkink, 2011; Hoffman-Goetz & Donelle, 2007) involved a content analysis of support message shared in an online context focused on one or more specific health conditions (e.g., online community dedicated to depression). As such, it was possible to categorize research reports based on the particular health condition examined. Although specific individuals' experiences with any one condition might vary, we expect that, in general, health conditions can be categorized as relatively higher or lower in each of the five dimensions. Contemporary medical science about the etiology and effects of the condition can be used to evaluate the degree to which each of the five dimensions of stressors was more or less prevalent for an *average* person coping with the condition. Accordingly, each author used information about the health condition available on the MedlinePlus website, which is operated by the National Institutes of Health, to evaluate the conditions based on the five dimensions. The authors used the information from MedlinePlus to determine whether each condition was generally—for the average person coping with the condition—relatively higher or lower on each of the five stressor dimensions. For example, because MedlinePlus (2014) indicates that attention deficit disorder (ADD) "causes problems in school, at home, and in social situations,"

it was coded as higher in the potential that one's relationships may be affected. The authors then met to resolve disagreements and make final determinations about how each condition was categorized. The ratings for each health condition across the five dimensions are available in Table 2. In reviewing the ratings, it should be noted that the conditions were not categorized as being objectively high or low in any of the dimensions. Conditions were rated as relatively higher or lower than other conditions for each of the five dimensions. These ratings were used in testing the hypotheses.

Table 2 Evaluation of health conditions based on stressor characteristics from the optimal matching model.

Health condition	Loss	Stigma	Controllability	Duration	Personal relationships
ADD	Lower	Higher	Higher	Longer	Higher
ALS	Higher	Lower	Lower	Longer	Higher
Anxiety	Lower	Higher	Higher	Shorter	Lower
Arthritis	Lower	Lower	Lower	Longer	Lower
Bereavement	Lower	Lower	Lower	Shorter	Higher
Breast cancer	Higher	Lower	Lower	Shorter	Higher
Breastfeeding	Lower	Lower	Higher	Shorter	Lower
Cancer	Higher	Lower	Lower	Shorter	Lower
Celiac	Lower	Lower	Higher	Longer	Lower
Clubfoot	Lower	Higher	Lower	Shorter	Lower
Hearing impairment	Lower	Higher	Lower	Longer	Higher
Depression	Lower	Higher	Higher	Shorter	Higher
Diabetes	Lower	Higher	Higher	Longer	Lower
Disabilities (physical)	Lower	Higher	Lower	Longer	Lower
Domestic violence	Lower	Higher	Higher	Shorter	Higher
Eating disorder	Higher	Higher	Higher	Shorter	Lower
Epilepsy	Lower	Higher	Lower	Longer	Higher
Fibromyalgia	Lower	Lower	Lower	Longer	Lower
Heart disease	Higher	Lower	Lower	Longer	Lower
HIV/AIDs	Higher	Higher	Lower	Longer	Higher
Hospice	Higher	Lower	Lower	Shorter	Higher
Huntington's disease	Higher	Lower	Lower	Longer	Higher
Infertility	Lower	Higher	Higher	Shorter	Higher
IBD	Lower	Lower	Higher	Longer	Lower
Leukemia	Higher	Lower	Lower	Shorter	Lower
Lung cancer	Higher	Higher	Lower	Shorter	Lower
Muscular dystrophy	Higher	Lower	Lower	Longer	Lower
Occupational stress	Lower	Lower	Higher	Shorter	Higher
Pregnancy	Lower	Lower	Higher	Shorter	Higher
Prostate cancer	Lower	Lower	Lower	Longer	Lower
Smoking (cessation)	Lower	Higher	Higher	Shorter	Lower
Weight loss/obesity	Lower	Higher	Higher	Shorter	Lower

Note: Each condition was rated as having a relatively lower or higher likelihood of loss, stigma, controllability, and impact on one's personal relationships as well as whether its relative duration is longer or shorter. Ratings were made with respect to the experience of an average person living with the condition.

Results

Types of Support Messages Shared Online

The research question asked about the relative prevalence of the five types of support messages. Prior to addressing this question, it was necessary first to standardize the data. Although Cutrona and Suhr's (1992) SSBC typology or commensurate categories were used in all of the reports, not all five categories of support were coded in each report. As such, the simple frequencies or proportions of messages within each category could not be used to answer the research question. These raw data would effectively bias the findings in favor of those categories of support messages that were more frequently included among the content analyses in the sample. Instead, the following procedure was used to standardize the frequencies of messages reported among the categories examined within each research report relative to chance. First, the number of categories of support messages coded in a given report was identified (with a maximum of 5) and used to determine the proportion of responses that would be expected in any category used in that report according to chance. Second, the observed proportion of responses within each category was computed (relative to the total number of support messages coded within a given report). Third, the proportion of messages in a category that would be expected by chance was subtracted from the proportion of actual responses observed in that category. The resulting value represents the proportion of responses observed in a given category within a report relative to the proportion that would be expected by chance. Larger values indicate that messages were more prevalent in a given category than would have been expected by chance. The raw frequencies and standardized proportions of support messages for each research report appear in Table 1.[1]

The research question asked about differences in the frequency with which different types of social support messages are shared in computer-mediated contexts about health. Because the observations within a particular research report are not independent, a repeated-measures analysis of variance (ANOVA) was conducted. Support message type was the within-subjects factor, and the standardized estimates of message frequency described previously were used in conducting the analysis. Using the Greenhouse-Geisser estimate of sphericity ($\varepsilon = 0.422$) to correct the degrees of freedom, the repeated-measures ANOVA was significant, $F(1.69, 27.03) = 27.56$, $p < .01$, $\eta_p^2 = .63$, indicating that differences existed across the five types of messages.

Paired t tests were conducted to examine pairwise differences. The results appear in Table 3. Informational support and emotional support messages appeared significantly more frequently than the other three categories but were not significantly different from one another. Network and esteem support were significantly more frequent than tangible support but not significantly different from one another. Tangible support appeared significantly less frequently than the other four categories. It should be noted that, although the repeated-measures ANOVA was limited to those research reports in which all five types of support were evaluated, the pairwise comparisons included all reports in which the two types of support being considered were coded.

Table 3 Mean differences and paired *t*-tests evaluating the relative prevalence of the five social support message types.

	Emotional	Informational	Tangible	Esteem	Network
Emotional	$M = .05$ ($SD = .19$)				
Informational	Mean difference $= -.07$ $t(40) = 1.21$, $p = .24$	$M = .12$ ($SD = .22$)			
Tangible	Mean difference $= .27$ $t(20) = 6.06$, $p < .01^*$	Mean difference $= .38$ $t(20) = 8.82$, $p < .01^*$	$M = -.17$ ($SD = .06$)		
Esteem	Mean difference $= .13$ $t(20) = 2.74$, $p = .01^*$	Mean difference $= .31$ $t(20) = 5.52$, $p < .01^*$	Mean difference $= -.08$ $t(16) = -4.41$, $p < .01^*$	$M = -.07$ ($SD = .11$)	
Network	Mean difference $= .16$ $t(18) = 3.78$, $p < .01^*$	Mean difference $= .36$ $t(18) = 6.92$, $p < .01^*$	Mean difference $= -.06$ $t(16) = -2.68$, $p = .02^*$	Mean difference $= .03$ $t(17) = 1.03$, $p = .32$	$M = -.10$ ($SD = .09$)

$^*p \leq .05$. *Note.* Means and standard deviations for the standardized proportion of each support type are reported in the diagonal.

Differences in Support Message Types based on Stressor Characteristics

The hypotheses predicted differences in the frequencies of different types of support messages based on five characteristics of stressors. Although the research question asked about differences in the prevalence of support message types *within* research reports in the sample, the hypotheses make predictions about the prevalence of specific types of support messages *between* research reports examining health conditions that represent higher or lower levels of a given stressor characteristic. As such, the raw frequencies of support messages from the content analyses were used in chi-square tests to evaluate the hypotheses. For each of the five types of support, cases that were higher for a given stressor characteristic were compared with cases that were lower for the characteristic. 2 × 2 chi-square tests were conducted using the number of support messages in which a particular type of support was present/absent and the levels (higher/lower) of a given stressor characteristic. Each analysis used data from only those cases in which the particular support type was evaluated. In several of the research reports (e.g., Alexander, 2002; Buis, 2007; Ginossar, 2008; Imbesi, 2010; van Uden-Kraan et al., 2008), the authors reported separate content analyses of support communities dedicated to different health conditions. In such instances, the data from the community(ies) dedicated to each specific health condition (e.g., depression, heart disease) were examined separately. The results of the chi-square analyses and post-hoc pairwise comparisons appear in Table 4. The results reflect the degree to which a

Table 4 Prevalence of support message types as a function of stressor characteristics: Chi-square test results and standardized residuals.

	Loss		Stigma		Controllability		Duration		Personal relationships	
	Lower $Prop_{raw}$	Higher $Prop_{raw}$	Lower $Prop_{raw}$	Higher $Prop_{raw}$	Lower $Prop_{raw}$	Higher $Prop_{raw}$	Shorter $Prop_{raw}$	Longer $Prop_{raw}$	Lower $Prop_{raw}$	Higher $Prop_{raw}$
Emotional	$.374^{a}$	$.456^{b}$	$.405^{a}$	$.391^{b}$	$.393^{a}$	$.401^{b}$	$.482^{a}$	$.303^{b}$	$.367^{a}$	$.432^{b}$
	$\chi^2(1, n = 79{,}720) = 456.07, p < .01, \phi = .08$		$\chi^2(1, n = 79{,}720) = 15.86, p < .01, \phi = .01$		$\chi^2(1, n = 79{,}720) = 5.01, p = .03, \phi = .01$		$\chi^2(1, n = 79{,}720) = 2{,}665.90, p < .01, \phi = .18$		$\chi^2(1, n = 79{,}720) = 348.32, p < .01, \phi = .07$	
Informational	$.518^{a}$	$.398^{b}$	$.519^{a}$	$.453^{b}$	$.480^{a}$	$.486^{a}$	$.419^{a}$	$.556^{b}$	$.533^{a}$	$.428^{b}$
	$\chi^2(1, n = 79{,}720) = 947.95, p < .01, \phi = .11$		$\chi^2(1, n = 79{,}720) = 339.02, p < .01, \phi = .07$		$\chi^2(1, n = 79{,}720) = 2.97, p = .09, \phi = .01$		$\chi^2(1, n = 79{,}720) = 1{,}483.09, p < .01, \phi = .14$		$\chi^2(1, n = 79{,}720) = 875.13, p < .01, \phi = .11$	
Esteem	$.091^{a}$	$.123^{b}$	$.079^{a}$	$.111^{b}$	$.106^{a}$	$.096^{b}$	$.098^{a}$	$.102^{a}$	$.104^{a}$	$.097^{b}$
	$\chi^2(1, n = 54{,}115) = 127.51, p < .01, \phi = .05$		$\chi^2(1, n = 54{,}115) = 136.32, p < .01, \phi = .05$		$\chi^2(1, n = 54{,}115) = 12.67, p < .01, \phi = .02$		$\chi^2(1, n = 54{,}115) = 2.97, p = .09, \phi = .01$		$\chi^2(1, n = 54{,}115) = 6.44, p = .01, \phi = .01$	
Network	$.101^{a}$	$.153^{b}$	$.129^{a}$	$.112^{b}$	$.120^{a}$	$.115^{a}$	$.093^{a}$	$.142^{b}$	$.092^{a}$	$.133^{b}$
	$\chi^2(1, n = 25{,}767) = 146.88, p < .01, \phi = .08$		$\chi^2(1, n = 25{,}767) = 16.95, p < .01, \phi = .03$		$\chi^2(1, n = 25{,}767) = 1.31, p = .25, \phi = .01$		$\chi^2(1, n = 25{,}767) = 149.44, p < .01, \phi = .08$		$\chi^2(1, n = 25{,}767) = 99.76, p < .01, \phi = .06$	
Tangible	$.050^{a}$	$.028^{b}$	$.032^{a}$	$.048^{b}$	$.031^{a}$	$.055^{b}$	$.033^{a}$	$.051^{b}$	$.064^{a}$	$.028^{b}$
	$\chi^2(1, n = 23{,}180) = 57.42, p < .01, \phi = .05$		$\chi^2(1, n = 23{,}180) = 30.19, p < .01, \phi = .04$		$\chi^2(1, n = 23{,}180) = 80.44, p < .01, \phi = .06$		$\chi^2(1, n = 23{,}180) = 46.87, p < .01, \phi = .05$		$\chi^2(1, n = 23{,}180) = 173.56, p < .01, \phi = .09$	

Notes: The chi-square analyses were conducted using the raw frequencies for each support message type. Significant chi-square values indicate differences in the distribution of a support message type based on the stressor characteristic. $Prop_{raw}$ = raw proportion of messages. The raw proportion in each cell was computed using the data from only those cases evaluating that particular stressor characteristic dimension and type of support (e.g., dividing the total number of emotional support messages across lower-loss cases by the total number of support messages coded in lower-loss cases that evaluated emotional support). Different superscripts indicate statistically significant differences between pairs of proportions based on *z*-tests ($p < .05$).

particular type of support message was more or less prevalent (relative to the total number of social support messages in cases where that type of support was evaluated), based on a particular stressor characteristic.

Hypothesis 1 predicted that action-facilitating types of support would be more common among content analyses examining health conditions that were more controllable. The results offered mixed support for this hypothesis. Although tangible support was significantly more common among content analyses examining higher controllability conditions than lower controllability conditions, the difference in informational support was not statistically significant. Hypothesis 2 predicted that nurturant support would be more common among content analyses examining health conditions that were more likely to impact personal relationships. The results largely supported Hypothesis 2. Both emotional and network support were significantly more common among health conditions that were more likely to impact personal relationships than among conditions that were less likely to impact personal relationships.

Hypothesis 3, which predicted that nurturant types of support would be more common among content analyses examining health conditions with a greater potential for loss in the form of death, was supported. All three types of nurturant support—emotional, esteem, and network support—were significantly more prevalent among content analyses examining conditions that had a relatively greater potential for death. The results were also consistent with Hypothesis 4. Informational support and tangible support were significantly more common among content analyses examining health conditions that had a relatively longer duration than among shorter-term conditions. Contrary to expectations, network support was also significantly more common among longer-term conditions.

Finally, Hypothesis 5 predicted that nurturant support would be more common among content analyses examining health conditions where the potential for stigma is higher than when it is lower. The results were largely inconsistent with Hypothesis 5. Only esteem support was significantly more prevalent among content analyses examining higher stigma conditions. Emotional support and network support were significantly less prevalent and tangible support was significantly more prevalent among content analyses examining higher stigma conditions relative to conditions where the potential for stigma was lower.

Discussion

The purpose of the present study was to examine social support expression in computer-mediated contexts among individuals coping with illness. The results of the meta-analytic review offer important insights about how social support is communicated online by identifying the prevalence of particular types of support messages and explaining when and why different types of support messages are more or less common. The findings and their implications for research on social support and computer-mediated communication are considered in the following paragraphs.

The Prevalence of Support Message Types

A primary goal of this project was to reconcile inconsistencies among previous content analyses and to determine if, in general, some types of support messages are more or less prevalent in health-related contexts online. The results of the meta-analytic review indicate that emotional and informational support were the most common types of support documented among the 41 content analyses included in the sample. Esteem and network support appeared less frequently. There were no differences in the prevalence of emotional and informational support or in the prevalence of esteem and network support. Tangible support messages appeared significantly less frequently than the other four types of support.

In addition to offering robust estimates of the prevalence of different support message types, this collection of findings advances our understanding of how computer-mediated communication is being used as a coping resource. Although several scholars have discussed its potential utility (e.g., Caplan & Turner, 2007; Tanis, 2008; Wright & Bell, 2003; Wright et al., 2011), the results from this study offer data-driven insights about support-related uses of computer-mediated communication among individuals coping with illness. The presence of informational and emotional support messages suggest that acquiring guidance and comforting are two primary functions. It is noteworthy that these two types of support have been linked with problem and emotion-focused forms of coping (Carver, Scheier, & Weintraub, 1989). Informational support such as advice and assistance can help foster problem-focused coping in which individuals attempt to take action to address a stressor. Emotional support, in contrast, such as empathy and validation can help individuals manage the negative affect associated with a stressor. The ability to connect with others facing the same health condition has been highlighted as an important reason why individuals seek support online (Tanis, 2008; Wright, 2002). These shared experiences may make online support providers a particularly valuable resource for information and empathy.

The results also indicate that computer-mediated contexts are a place where individuals can potentially expand their social networks and receive messages to bolster their self-confidence and worth. One advantage of online support contexts for coping with health concerns is that they provide access to a larger network of weak ties than is typically available offline (Wright & Bell, 2003; Wright & Miller, 2010). Moreover, the findings regarding esteem support messages are consistent with claims that online support networks can be efficacy-building, in that they help bolster a support seekers' sense of control over their illness (Rains & Young, 2009). The results of this study also speak to the limits of online support resources. Unlike offline weak ties, which one might turn to for aid such as a ride to the doctor or help with housework, the results offer compelling evidence that such offers of assistance are not typical online. Taken as a whole, the findings from this project offer concrete evidence that computer-mediated communication serves several important functions—particularly providing guidance and comforting—among individuals coping with illness.

In considering the study results, it should be noted that the primary data from the content analyses involved interactions among the lay public. Although it is reasonable to assume that the support messages were produced by individuals coping with similar health issues, it is important to keep in mind that these individuals typically were not health professionals. As such, the insights offered by this project are largely limited to support provision by members of the lay public. The findings may not extend to supportive interactions between patients and medical professionals or other healthcare providers.

Differences in the Prevalence of Support Messages Based on Stressor Characteristics

The optimal matching model (Cutrona, 1990; Cutrona & Russell, 1990) was applied to examine when and why some types of support are more or less prevalent in computer-mediated contexts. Several dimensions of stressors identified by Cutrona and Russell (1990) were tailored to illness in order to make predictions about variations in the prevalence of different support message types. It was assumed that the various stressors may make particular needs salient among support seekers, which would be reflected in the prevalence of particular types of support messages shared by providers in computer-mediated contexts. The results were consistent with several of the hypotheses. Nurturant forms of support messages were more common in content analyses examining health conditions likely to affect personal relationships. Emotional and network support, in particular, may be helpful to cope with the aversive emotions stemming from the strain placed on one's personal relationships and expand one's network to additional support resources.

The findings regarding loss and illness duration were also largely consistent with study predictions. Socio-emotional selectivity theory (Carstensen, 1995; Lockenhoff & Carstensen, 2004) informed these hypotheses. Socio-emotional selectivity theory suggests that, because their perceptions of time become more limited, individuals coping with an illness that might result in mortality (i.e., higher loss) should be particularly concerned with regulating their emotions. The results showed that emotional, esteem, and network support messages were all more prevalent among content analyses examining health conditions where the potential for loss in the form of death was greater. When the future is more open-ended, as would be the case with more long-term or chronic conditions, socio-emotional selectivity theory predicts that acquiring information is a salient motivation. As predicted, both types of action-facilitating support (i.e., informational and tangible support) were more prevalent among content analyses examining relatively chronic conditions than among more acute conditions.

The results were mixed for controllability and were largely inconsistent with the predictions regarding stigma. The findings regarding controllability are noteworthy because it is the stressor discussed in most detail in the optimal matching model (Cutrona & Russell, 1990; Cutrona & Suhr, 1992). That informational support, in particular, was not more common among content analyses examining health conditions that are more controllable is somewhat surprising. Yet, this finding might be an artifact of the stressor examined in this study. Although controllability is

discussed in the optimal matching model in terms of stressors in general (Cutrona & Russell, 1990), virtually all health conditions are somewhat uncontrollable, in that they develop without the consent of the afflicted. Stigma is not a dimension of stressors identified in the optimal matching model. However, it is a construct that is intimately linked with illness (Smith, 2011), and online support from weak ties has been argued to be particularly critical for individuals who perceive stigma associated with their health condition (Tanis, 2008; Wright & Rains, 2013). Only the results for esteem support were consistent with the study predictions regarding stigma. Esteem support messages were more prevalent among content analyses examining conditions where stigma was more likely. Given that health-related stigma is widely recognized to have direct implications for one's sense of self (Berger et al., 2001; Scambler, 2009), it may be that attempting to bolster others' self-concepts takes on an increasingly important role in online settings dedicated to more stigmatized health conditions.

Beyond isolating instances when specific types of social support are particularly important, the findings from this meta-analysis help advance research and theory on social support by offering insights about the mechanisms through which supportive communication may foster coping, both off- and online. The trends revealed across the different types of stressors highlight some specific ways in which social support messages likely produce salutatory effects. Taken as a whole, the findings suggest that social support may be particularly critical for restoring lost or damaged connections, managing aversive emotions, bolstering one's sense of self, and offering direction and assistance. The wide range of potential mechanisms through which supportive communication may function underscores the complexity of this phenomenon.

More broadly, the current study contributes to research on supportive communication by demonstrating how several key variables from the optimal matching model (Cutrona & Russell, 1990) were associated with the expression of various types of social support across a large number of content analyses. Although the benefits of support matching and matching theories have been questioned (MacGeorge et al., 2011), the results show that, across a large and diverse range of health conditions, the prevalence of particular types of support messages varied as stressor characteristics were more and less salient. The results of this project cannot speak to the consequences of those support messages, but their prevalence vis-à-vis specific stressor characteristics underscores the possibility that some types of support are especially useful in particular contexts. Additionally, incorporating ideas from socio-emotional selectivity theory (Carstensen, 1995; Lockenhoff & Carstensen, 2004) helps advance theorizing about the optimal matching model by refining the justification for the loss and duration and dimensions of stressors, both of which have received little attention in the model (Cutrona & Russell, 1990). Socio-emotional selectivity theory offers a detailed explanation about how loss and duration may impact support preferences and effects.

Reflections on the State of Scholarship Examining Support Expression Online

The process of reviewing and aggregating existing research examining support expression in computer-mediated contexts makes possible a number of insights

about the state of online support scholarship. As a whole, the studies in the sample are noteworthy for several reasons. First, although some studies have examined support expression in blogs (Tong et al., 2013), microblogs (Turner-McGrievy & Tate, 2013), and social network sites (Ashley, 2012), an overwhelming majority of the studies in the sample examined online support communities—a logical context in which to study this phenomenon. Additional research would be valuable to examine novel online settings and explore differences across settings. It may be that some of the characteristics that distinguish online communities from contexts such as social network sites and microblogs, including the degree to which individuals also share offline connections, could have implications for the nature of supportive exchanges. Offers of tangible assistance, for example, may be more common in social network sites than discussion communities.

Second, of the non-intervention studies in the sample, fewer than half included demographic information about who was seeking and sharing support. Those studies that included such information reported that women comprised the majority of contributors. Men accounted for only one-quarter of contributors, although the sex of a significant proportion of the contributors could not be identified. These data suggest either that the majority of people who seek and share support online are women or that existing research has tended to focus on health conditions or sample communities that are particularly relevant to women. Additional research exploring the implications of sex for computer-mediated support would be valuable. Given sex differences demonstrated in previous research related to supportive communication offline (e.g., Goldsmith & Dun, 1997), it may be that sex differences exist in the degree to which men and women seek support online as well as the nature of supportive exchanges in computer-mediated contexts.

Finally, a majority of the studies in the sample were descriptive and not grounded in theory related to supportive communication or computer-mediated communication. Although such descriptive research is valuable, fully understanding the implications of computer-mediated support likely requires embracing theory. A diverse set of theories—ranging from those that address the implications of computer-mediated communication for impression formation (Walther, 1996) and relationship development (Walther, 1992) to theories dedicated to explaining how comforting communication confers benefits (Burleson & Goldsmith, 1998; Caplan & Turner, 2007) and even theories about managing health-related uncertainty more generally (Brashers, 2001)—would offer a valuable foundation for exploring and better understanding computer-mediated support processes.

Limitations

Two limitations of this project warrant consideration. First, in a traditional meta-analytic review, the estimates derived from each case are typically weighted such that cases with a larger sample—and, presumably, more accurate population estimates—are assigned greater weight (Borenstein et al., 2011; Hedges & Olkin, 1985). Although formal weights were not applied in this study, use of the raw frequencies for the

various support message categories used to test the hypotheses made possible a commensurate approach. Research reports in which more messages were coded effectively made a greater contribution to the total number of messages in a given category. The tests conducted to answer the research question necessitated that all cases be weighted equally. Yet, this approach made it possible to summarize the findings across a sample in which a number of content analyses did not examine all five types of support messages.

A second limitation involves the nature of the data from this project. The content analyses summarized in this meta-analytic review speak only to the prevalence of different types of support messages. They do not address the quality of those messages. Researchers have identified several factors, such as facework (Goldsmith, 1994) and advice feasibility (MacGeorge, Feng, & Thompson, 2008), that can make supportive messages more or less effective. Moreover, there is evidence that supportive messages do not always produce desirable outcomes (Coty & Wallston, 2010; Dunkel-Schetter, 1984; Lehman & Hemphill, 1990). Nonetheless, there remains a great deal of value in better understanding systematic differences in the types of support messages shared in computer-mediated contexts.

Conclusion

Although the specific contexts may evolve as novel forms of computer-mediated communication are developed, it seems reasonable that social support acquired online will continue to be an important resource among individuals coping with illness. It is incumbent upon scholars to understand better how social support is being communicated in these contexts and with what consequences. The results of this meta-analytic review offer an initial step in explaining the patterns of support messages shared online. Through continued research, it will be possible to understand more fully the nuances of computer-mediated support and, ultimately, foster better health among individuals coping with illness.

Note

[1] To illustrate the standardization procedure, consider Braithwaite and colleagues' (1999) content analysis, which was previously discussed. They reported the following raw number of messages in each category: informational support (n = 461), emotional support (n = 590), tangible support (n = 41), esteem support (n = 275), network support (n = 105). Because they used all five categories, the proportion of messages expected by chance in each category would be .20. The proportion of messages observed in each category was computed, and then the proportion expected by chance was subtracted from this value. The standardized proportion of messages within each category for Braithwaite and colleagues' study were as follows: informational support (.11), emotional support (.20), tangible support (–.17), esteem support (–.01), and network support (–.13).

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*Indicates a research report included in the meta-analysis.

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