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#Stupidcancer: Exploring a Typology of Social Support and the Role of Emotional Expression in a Social Media Community

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## ABSTRACT

Social network sites (SNSs) like Twitter continue to attract users, many of whom turn to these spaces for social support for serious illnesses like cancer. Building on literature that explored the functionality of online spaces for health-related social support, we propose a typology that situates this type of support in an SNS-based open cancer community based on the type (informational or emotional) and the direction (expression or reception) of support. A content analysis applied the typology to a 2-year span of Twitter messages using the popular hashtag "#stupidcancer." Given that emotions form the basis for much of human communication and behavior, including aspects of social support, this content analysis also examined the relationship between emotional expression and online social support in tweets about cancer. Furthermore, this study looked at the various ways in which Twitter allows for message sharing across a user's entire network (not just among the cancer community). This work thus begins to lay the conceptual and empirical groundwork for future research testing the effects of various types of social support in open, interactive online cancer communities.

Traditional social support groups required meeting at specific times, whereas online communities allow those who need support to meet anytime and to come together no matter their physical location. As such, individuals are increasingly turning to computer-mediated forms of social support to deal with serious illnesses like cancer. The use of such digital spaces to connect with others can be beneficial for those impacted by cancer (e.g., Han et al., 2011; Klemm, Reppert, & Visich, 1998; Klemm & Wheeler, 2005). However, research on evolving online platforms for social support, such as social network sites (SNSs), suggests these channels are more open to the public and include a larger number of connections than previously studied online social support groups (OSGs). SNSs, such as the microblogging site Twitter, add new wrinkles to previously established typologies of social support. Digital environments are increasingly public and interactive and present many avenues for users to ask questions, share information, offer encouragement, and express emotions related to the realities of cancer. The characteristics of SNSs beg for new approaches to investigating social support in a community where the boundaries of who is a part of the cancer community are broader than ever before.

The purpose of the present work is to explore the intersections of social support, emotional expression, and message sharing in an online grass-roots cancer community. Based on existing literature, we propose a typology for applying previous work on social support to the limited-length, interactive, and public environment of SNSs. These SNSs act as de facto social support groups for cancer patients, physicians, survivors, family members, and others affected by any type of cancer, whereas previous work analyzing computer-mediated social support for cancer patients has typically focused on closed, patient-only platforms limited to specific subtypes of cancer. We use a content analysis of the "#stupidcancer" hashtag on Twitter to apply the proposed typology to SNS content. This content analysis also provides insights into how social media users express social support, receive social support, and create emotion-infused content in this environment where each message is limited to a mere 140 characters.

Studying the relationships between emotional expression and social support variables provides additional insights as to how the affective features of microblog posts relate to message content and message sharing. Given that emotions form the basis for much of human behavior as well as for many forms of social support, discerning the nature of the connection between emotional expression and online social support is an important contribution of this study. Furthermore, we analyze the various ways in which users distribute cancer-focused social support message across an SNS platform. Twitter allows its users to post original content (i.e., tweets), to share others’ content (i.e., retweets), or to favorite specific Twitter messages so that these messages are broadcast across a user’s entire network and not just to those within a hashtag community. The findings provide a conceptual and empirical groundwork for future research testing the effects of social support in SNS-based cancer communities.
Literature review

Online social support

Human beings are social creatures and often turn to each other for physical assistance and psychological sustenance (Fiske, 2010). This relational nature of human life is at the core of the concept of social support. Shumaker and Brownell (1984) define social support as “an exchange of resources between at least two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient” (p. 13). There are numerous links between social support and physical and mental well-being (Reblin & Uchino, 2008; Uchino, 2006; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Social support can also alleviate the negative effects of stress (Lieberman & Goldstein, 2005; Sarason, Sarason, & Pierce, 1990). Moreover, social support offered via the Internet can likewise contribute to an individual’s overall well-being (Klemm & Wheeler, 2005; White & Dorman, 2001).

Types of social support

The concept of social support can be divided into subdimensions, specifically informational support and emotional support (Sherbourne & Stewart, 1991; Uchino et al., 1996). Informational support is the act of providing information to aid another individual or group. In the context of SNSs, information sharing can serve as informational support and has been shown to help SNS users build their networks and gain health-relevant knowledge (Eysenbach, 2008). As Chung (2013) noted, OSGs rely on the clear conveyance of information and intent between members to function effectively. For instance, Wicks et al. (2012) found that sharing information in an online epilepsy community within the PatientsLikeMe SNS helped individuals manage their conditions more effectively. Specific to cancer, Meier et al. (2007) found that informational support was the most frequent type of support offered in cancer-related Internet mailing lists. One way that informational support in an SNS environment could differ from face-to-face informational support is that SNS users can share information by including hyperlinks to outside sources in their messages. Indeed, more than a quarter of all messages on Twitter contain hyperlinks, which can help Twitter users extend the impact of their 140-characters-or-less messages (Gao, Zhang, Li, & Hou, 2012). Additionally, the use of hyperlinks in Twitter can create denser social networks where interactions between users become more personal and sustained (Hsu & Park, 2011).

The second component of social support—emotional support—also has a strong connection to the cancer experience. Emotional support is the act of acknowledging or validating another person’s feelings or providing reassurance and encouragement (Sherbourne & Stewart, 1991; Uchino et al., 1996). Studies have shown that cancer patients rate emotional support as the most effective kind of social support (Dakof & Taylor, 1990; Dunkel-Schetter, 1984; Neuling & Winefield, 1988; Yoo et al., 2014).

Within these broad categories of informational and emotional support, researchers have delineated more specific types of social support in health-related networks. For example, Han et al. (2011) classified expressions of empathy, offerings of encouragement, requests of help, offers of prayer, mentions of Christian religious beliefs, and general religious/spiritual views as subtypes of emotional support. Additionally, studies by Shaw, Hawkins, McTavish, Pingree, and Gustafson (2006) found that insightful disclosure or a sharing of personal experiences among breast cancer patients also operated as a form of online social support and that this disclosure was associated with a range of psychosocial benefits. Researchers have also identified the expression of gratitude as an important form of online social support (Klemm et al., 1998; Klemm & Wheeler, 2005).

To summarize, there are two broad types of social support that are applicable in a computer-mediated communication environment: informational and emotional. Beyond these broad categories, other scholars have classified more specific types of social support including information giving, empathy, encouragement, religious statements, disclosing personal information, and giving thanks. We next discuss how the direction of social support, in addition to the type of support, is also an important component for understanding the ways in which the cancer community can use SNSs for social support purposes.

Direction of social support

Social support comes in various forms and, as an interpersonal action, comes with a direction. That is, individuals can give and/or receive social support. Namkoong et al. (2010), Han et al. (2011), Kim et al. (2012), and Namkoong et al. (2013) distinguished between message reception and message expression effects for a small group of breast cancer patients using a closed online system. They found that expressing social support benefited members of specific breast cancer communities who used the closed system to connect with others in similar situations. The expression of social support is a dynamic process that ebbs and flows over time in digitally connected cancer support groups. Yoo et al. (2013) found that the expression of social support can vary based on individual differences in age, living situation, comfort level with communication technology, and cancer coping strategies. Given the dynamic nature of the expression of social support in online cancer-related networks, it is likely that cancer-related social support flows in both directions within interactive SNS platforms.

Social support on SNSs

This study adds to existing research by providing an alternative classification system for social support expression and reception in an SNS. A new typology is necessary due to the different affordances of this space—open access to anyone with an Internet connection, with any type of connection to cancer, and norms of interactivity and message sharing. For instance, the aforementioned studies operationalized social support reception as passive exposure to social support messages.
However, in an SNS like Twitter where most users can see and respond to any other user’s messages, reception can be more active. Twitter users who are not formally invited into a group are able to find others with similar interests via a hashtag (i.e., #stupidcancer, #cancersucks) and can then request social support (be it informational or emotional) or openly acknowledge provisions of social support. While reading a tweet containing social support might not fully engage a user who is just browsing through the website and incidentally encounters a cancer-related message, there exists the opportunity (encouraged by site features) to reply to or share the tweet containing social support elements, thereby adding an element of action to previous conceptualizations of support reception as passive.

Notably, the space for active social support reception or expression is quite limited on Twitter, which restricts messages to 140 characters. This feature makes the provision of hyperlinks to outside content an important form of social support yet to be thoroughly examined in the context of online cancer communities. Hyperlinks allow users to advance their interests in various ideas or opinions, thereby providing context that compliments short tweets and allows other users to further engage with the topic at hand (De Maeyer, 2013; Hsu & Park, 2011). While links promote rapid knowledge sharing and acquisition (Hughes & Palen, 2009), they also allow for bonding between individuals. As Holton, Baek, Coddington, and Yaschur (2014) illustrated, Twitter users frequently seek and share information within single tweets, forming sustainable communities around particular topics with the mutual exchange of information via links.

In this regard, Twitter is not only a relatively new avenue to obtain support and health information (Kim et al., 2012), but is also an arena where communities of support can be nourished through the exchange of content and links. Those individuals who turn to the Internet for health information often seek support from others in similar situations (Eysenbach, Powell, Englesakis, Rizo, & Stern, 2004), suggesting that SNS users have the opportunity to do the same. Indeed, computer-mediated peer-to-peer support groups have proliferated with the rise of the digital age, and social media platforms have provided an additional outlet for individuals concerned about health issues to connect, talk with each other, share information, and provide and/or receive support (e.g., Himelboim & Han, 2014; Love et al., 2012).

A number of studies have championed the positive benefits of OSGs, noting their ability to transcend temporal and geographical restraints while offering spaces for patients, family members and friends, physicians, and other health care professionals to connect (Barak, Boniel-Nissim, & Suler, 2008; Hong, Peña-Purcell, & Ory, 2012). Others have observed that SNSs have emerged as spaces for real-time conversations, greater heterogeneity among group members, and community building (Dizon et al., 2012; Love et al., 2012). Individuals, groups, and organizations attempting to buck the ephemeral nature of Twitter engagement can use hashtags to “solidify long-standing communities of Twitter users” (Bruns & Moe, 2014, p. 18). Hashtags help create a community wherein users can share information and social support with each other. Additionally, hashtags also allow users outside of the community to observe and potentially join the conversations.

<table>
<thead>
<tr>
<th>Table 1. Proposed typology of online social support in an open interactive network</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Support</strong></td>
</tr>
<tr>
<td>Informational</td>
</tr>
<tr>
<td>Emotional</td>
</tr>
<tr>
<td>Information seeking, detailed experiences</td>
</tr>
</tbody>
</table>

Given the unique properties of Twitter as an interactive and open online support group for the cancer community—broadly defined—we propose a typology of social support content for the SNS environment (see Table 1). The typology is based on two dimensions: (a) type of support (informational or emotional), and (b) direction of support (expression or reception). We situate specific subtypes of online social support (e.g., information giving, empathy, information seeking) into each of the four quadrants created by crossing these dimensions. Given that the typology has yet to be applied to SNS content, we propose the following research question:

RQ1: Which forms of social support (using the proposed typology based on type and direction of social support) will be most common in a Twitter-based cancer community?

**Emotions, emotional expression, and social support**

In addition to examining the type and direction of support, another interesting aspect of social support messages on SNSs is the sentimental, or emotional, currency community members exchange with each other. In this context, distinctions can be made between emotional support and emotional expression. They are qualitatively different concepts and users have different motivations for employing each in their online communications. Emotional support, as described earlier, generally occurs when sympathy or empathy is expressed or exchanged. Emotional expression, on the other hand, is a communication about how the user feels. Cancer is often associated with a plethora of emotions, ranging from fear, anger, and sadness to hope and humor (Mukherjee, 2010). Expressing these emotions via writing has been shown to help cancer patients cope with the disease (Pennebaker, 1997). Han et al. (2008) also found that for women with breast cancer who participated in a closed online support group, expression of positive emotions reduced their experiences of negative emotions. Studying the emotional content of tweets is an especially valuable exercise because the collective mood of Twitter content is linked with outcomes like stock market swings, election results, and the spread of disease (Bollen, Mao, & Zeng, 2011; DiGrazia, McKelvey, Bollen, & Rojas, 2013; Signorini, Segre, & Polgreen, 2011).

In the limited-space environment of SNSs, users may purposefully include some form of emotional expression in a message as a way to add meaning or forge connections with others within the space limitations of the platform. Therefore, emotional expressions may accompany informational forms of social support in addition to existing alongside emotional social support messages. It remains to be seen which discrete
emotional expressions are tied with various forms of online social support expression and reception.

An understanding of the emotional expressions in social support messages could help inform current and future research on the potential effects of SNS-based social support because various emotions have different effects on information processing and behavior. According to appraisal theory (Lazarus, 1991), different discrete emotions are associated with different signal values and action tendencies (see Table 2). Furthermore, Nabi’s (2003) emotions-as-frames model argues that even very subtle emotional primes can shape how users respond to subsequent messages. This view of emotions posits that messages that match the core relational theme and appraisals inherent in the emotional state of a user are more accessible than messages inconsistent with the user’s emotional state. Nabi’s work also demonstrates that emotional reactions to messages influence how individuals think about potential causes and solutions to problems. Therefore, tweets containing social support messages related to cancer may suggest solutions to cancer-related dilemmas that could then become more or less palatable to other users in the community, depending on their own emotional states.

Existing research provides clues as to which specific emotions expressed via Twitter may be associated with social support. A study of an online support group for cancer caregivers found that hopeful statements were the most common type of emotion expressed in support group messages, followed by mentions of being on an emotional rollercoaster (Klemm & Wheeler, 2005). Additional work has found that humor can also bring together individuals in a community by fostering mutual identification and clarifying values (Meyer, 2000). Moreover, humor can help people cope with stressful situations (Wanzer, Booth-Butterfield, & Booth-Butterfield, 2005), including illnesses (e.g., Christie & Moore, 2005; Johnson, 2002). For instance, a study of breast cancer patients found that the use of humor postsurgery predicted less distress (Carver et al., 1993).

Additionally, because cancer is a potentially deadly disease filled with uncertainty and anguish, negative emotions such as anger, fear, and sadness are unavoidable in this context. SNSs may be effective outlets for expressing these feelings because they provide users with opportunities to give or receive encouragement for coping with such negative emotions. The presence of negative emotional expressions in an SNS-based cancer community may be one reason other users decide to provide emotional social support, such as provisions of empathy or encouragement, to other community members. The co-association of emotional expressions and these subtypes of support is worth investigating because emotional social support is associated with improved coping during stressful events and/or health issues (e.g., Han et al., 2011). Based on the aforementioned literature, we propose the following research question:

**RQ2: What is the relationship between emotional expression and social support categories within a Twitter-based cancer community?**

### Message sharing

One of the unique features of Twitter compared to closed OSGs is that Twitter messages can be easily and quickly shared both within the cancer network and to anyone else who is connected to members of that network. Users can share messages across Twitter via the retweet and favorite functions. These allow Twitter users both to express their interest in a tweet and to amplify the reach of that tweet by distributing it to additional users in their networks.

Communication research also recognizes the role of emotional content in motivating computer-mediated message sharing. In an examination of the most shared online *New York Times* articles, Berger and Milkman (2012) found that stories with positive emotional overtones were more likely to be shared than negative content, but stories that elicited stronger, high-arousal emotions, regardless of valence, were more likely to be shared than stories that did not spur strong emotional reactions. Likewise, in a diary study of consumers’ information sharing via mobile phones, more than 40% of all shared information contained expressions of emotions, with positive emotions more common than negative emotions in the mobile messages that were shared (Goh, Ang, Chua, & Lee, 2009). Based on the importance of emotional expression in the spread of online content and the coexistence of emotional and social support on SNSs, we ask the following research question:

**RQ3: Which types of discrete emotional expressions and social support messages are related to message sharing in a Twitter-based cancer community?**

### Methods

The specific OSG chosen for this study was created by an organization called Stupid Cancer. Responding to a perceived need for broader conversations on cancer, Stupid Cancer aimed to engage the full spectrum of individuals affected by cancer. The organization was particularly interested in engaging younger people and those not otherwise well represented by medical or advocacy groups that tend to be diagnosis specific or treatment specific (StupidCancer, 2014). For Stupid Cancer’s cause, SNSs emerged as an essential tool for

### Table 2. Psychological properties of discrete emotions coded for in #stupidcancer tweets.

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Signal Value</th>
<th>Function</th>
<th>Action Tendency</th>
<th>Valence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hope</td>
<td>Chance of improvement in situation</td>
<td>Perseverance in the face of challenges</td>
<td>Mobilization/vigilance/commitment</td>
<td>Positive/mixed</td>
</tr>
<tr>
<td>Fear</td>
<td>Danger</td>
<td>Protection</td>
<td>Revise existing plan/create new plan</td>
<td>Negative</td>
</tr>
<tr>
<td>Happiness/humor</td>
<td>Progress toward goal</td>
<td>Self-reward</td>
<td>Bask/bond</td>
<td>Positive</td>
</tr>
<tr>
<td>Anger</td>
<td>Obstacle</td>
<td>Remove obstacle</td>
<td>Attack/reject</td>
<td>Negative</td>
</tr>
<tr>
<td>Sadness/despair</td>
<td>Failure</td>
<td>Learning/recuperation</td>
<td>Review plan/convalesce</td>
<td>Negative</td>
</tr>
</tbody>
</table>

several reasons. The organization developed around the same time SNSs began launching and growing, making digital community building central to the organization’s ethos (StupidCancer, 2014). Also, its target population of young adults has been a group more likely than other demographic cohorts to engage in online social networking (Chou, Hunt, Beckjord, Moser, & Hesse, 2009). Lastly, with the mission to broadly reach those affected by cancer regardless of diagnosis or location on the treatment spectrum, digital media can offer a unique platform to work around barriers to support and access. By participating in a hashtag community focused on #stupidcancer, individuals can break out of diagnosis-specific silos to gather information about the broader, human experiences of cancer. Moreover, with the potential for anonymity, SNSs offer a platform for those in the cancer community to ask and/or answer the delicate questions common to cancer. These include questions related to issues of sexual function, physical markers of surgery, or emotional trauma, all of which are not always easy to discuss face-to-face or in a public way. By providing a space for discussing and learning about these issues across cancer experiences, the #stupidcancer hashtag community offers a wide breadth of online support social support content.

**Sampling procedure**

Data were collected using NodeXL’s Twitter Search importer (Hansen, Shneiderman, & Smith, 2011), which was set to identify the most recent 1,000 Twitter users who included the hashtag “#stupidcancer” in their tweets. This collection method results in topic-networks with the host as the topic. The Twitter Application Programming Interface (API), when data collection started, limited the amount of content that can be downloaded to about 1,000 users per data set. For purposes of standardization, data were collected every Tuesday, Thursday, and Saturday at 4:30 p.m., every week for 2 years (September 15, 2011, to September 17, 2013).

The collection process resulted in 76,806 tweets, including many duplicates, an expected phenomenon considering the popularity of retweeting on Twitter. After removing duplicates, these tweets were condensed into a list of unique tweets ($n = 18,571$), while calculating the frequency (i.e., total number of retweets plus the total number of mentions) of each tweet. The distribution of these frequencies followed the power-law degree distribution, a heavily skewed distribution where a few tweets were retweeted many times, and others much less often. A simple random sample was therefore inappropriate as it is likely to miss the most retweeted messages. Therefor, a stratified sample procedure was applied based on the 10th percentile points of the accumulating frequencies. For instance, the first stratum of tweets was defined so the accumulating frequencies of its tweets added up to about 10% of all tweets. The number of unique tweets in each stratum differed, but the number of tweets each captured remained fairly similar (about 7,000). The power-law distribution is characterized by a “fat tail,” meaning low frequencies are more common than high frequencies. For this reason, tweets with a frequency of 4 captured 20% of the tweets and those with a frequency of 3 captured about 30%. About 200 tweets were randomly sampled of each 10% of the data (see Table 3), providing for a final sample of 1,957 tweets. The resulting dependent variable is of an order type.

**Coding procedure**

The authors developed a coding scheme to operationalize social support and emotional expressions found in tweets using the “#stupidcancer” hashtag. Two trained coders performed two pretests on data not included in the sample of this study establish intercoder reliability (ICR). The first pretest resulted in an overall ICR of .68, below the acceptable Krippendorf’s alpha of .80 or higher. The coders met with the secondary author to again go through the coding scheme and procedure, producing an overall ICR of .80 on a second pretest. Each of the coders then coded approximately half the sample used in this study, including an overlapping portion of 20% of the sample to obtain the ICR scores reported in the following.

Information giving (ICR = .92) was defined as providing information to others (e.g., “when you’re nauseous from chemo, eat ice cream”), while information seeking (ICR = .90) was defined as asking others for guidance (e.g., “anybody know what I should do with this diagnosis?”). Tweets providing encouragement were those that told an individual he or she could do something (ICR = .86). Sharing individual experiences (e.g., “I accidentally swallowed a suppository today, oops”) was coded as a form of social support because it helps users relate to each other and realize they are not alone (ICR = .84). Giving thanks (e.g., “I’m grateful for the nurse’s help today”) also served as a form of social support because it can help users recognize their own gratitude (ICR = .90). Religious support (e.g., “I’m praying for you”) was another form of social support (ICR = .94). Empathetic messages (e.g., “I feel your pain,” or “I’m so sorry”) comprised another form of social support coded for in the study (ICR = .86).

Five categorizations dealt with emotional expressions. Messages expressing hope (ICR = .92) included explicit mentions of hope, optimism, optimistic, hopeful, or hopefulness, as well as messages that had a strong implicit link to hope (e.g., “I have a gut feeling things will work out for you in the end”). Expressions of sadness or desperation (ICR = .88) included messages discussing sadness, despair, or despondency. Likewise, expressing fear (ICR = .88) involved communicating fear or anxiety or describing cancer, treatment, or death as scary. Humor (ICR = .82) expressions included jokes

<table>
<thead>
<tr>
<th>Strata</th>
<th>Frequency of retweets</th>
<th>Tweets in sample (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>≤ 2</td>
<td>200</td>
</tr>
<tr>
<td>10–30</td>
<td>3</td>
<td>600</td>
</tr>
<tr>
<td>40–50</td>
<td>4</td>
<td>400</td>
</tr>
<tr>
<td>70</td>
<td>7–10</td>
<td>200</td>
</tr>
<tr>
<td>80</td>
<td>11–23</td>
<td>200</td>
</tr>
<tr>
<td>90</td>
<td>≥ 24</td>
<td>200</td>
</tr>
</tbody>
</table>

**Table 3. Sampling selection by frequency of retweets.**

Downloaded by [Indiana University Libraries] at 05:40 22 October 2015
about cancer as well as the use of phrases like “lol” or “haha.” Expressions of anger (ICR = .88) included messages stating frustration (e.g., “I hate cancer,” “f.u. cancer,” “I’m so mad right now,” etc.). Finally, message sharing, operationalized as a tweet being retweeted or favorited so that other users who follow the original user can likewise see the tweet, was automatically coded by NodeXL (range = 1–533, M = 8.51, SD = 18.59).

**Results**

Descriptive statistics provide an overview of the nature of the sample (see Table 4). Nearly two-thirds (64.7%) of all sampled tweets contained the social support element of information sharing, and nearly one out of every five tweets (19.7%) offered hope. About 12% of the tweets discussed individual detailed experiences with cancer, while more than three out every five tweets in the sample (60.9%) included hyperlinks.

The first research question asked which types of online social support, based on the proposed typology of type and direction of support, would be most prominent in the current sample. Two-thirds (66.6%) of all tweets in the sample expressed some form of informational support (n = 1,304). The next most common form of social support was information reception, present in 12.9% of tweets (n = 252). Emotional expression, present in 12.0% of tweets, was nearly as common as information reception (n = 234), while emotional reception was the least frequent type of social support found in the sample (4.6%, n = 91).

The second research question asked which types of emotional expression were associated with which types of social support. Multiple hierarchical logistic regressions with emotions as the predictor variables and separate analyses for each type of social support were used to analyze the relationships between these variables (see Table 5). The results showed that hope was positively related to information giving, encouragement, detailed explanations, giving thanks, and religion, and negatively related to link giving. Sadness was positively related to detailed explanation, religion, and empathy, and negatively related to information giving, giving thanks, and link giving. Fear was positively related to information seeking, detailed explanations, and empathy, and negatively related to link presence. Humor was positively related to giving thanks and detailed explanations, and negatively related to link presence. Finally, anger was positively related to detailed explanation and negatively related to link presence.

### Table 4. Elements of social support and emotional expression in tweets for #stupidcancer.

<table>
<thead>
<tr>
<th>Element</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information sharing</td>
<td>1266</td>
<td>64.7</td>
</tr>
<tr>
<td>Link presence</td>
<td>1,192</td>
<td>60.9</td>
</tr>
<tr>
<td>Individual experiences</td>
<td>229</td>
<td>11.7</td>
</tr>
<tr>
<td>Encouragement</td>
<td>133</td>
<td>6.8</td>
</tr>
<tr>
<td>Giving thanks</td>
<td>90</td>
<td>4.6</td>
</tr>
<tr>
<td>Empathy</td>
<td>55</td>
<td>2.8</td>
</tr>
<tr>
<td>Religious expression</td>
<td>45</td>
<td>2.3</td>
</tr>
<tr>
<td>Information seeking</td>
<td>24</td>
<td>1.2</td>
</tr>
</tbody>
</table>

### Table 5. Multiple logistic regressions testing emotional expressions as predictors of different types of social support.

<table>
<thead>
<tr>
<th>Informational expression</th>
<th>Information giving</th>
<th>Link providing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hope</td>
<td>1.98* [1.31, 3.00]*</td>
<td>.36* [28, 46]*</td>
</tr>
<tr>
<td>Fear</td>
<td>.00 [0.00, 1]</td>
<td>.13* [0.03, 0.61]*</td>
</tr>
<tr>
<td>Humor</td>
<td>.00 [0.00, 1]</td>
<td>.27* [1.12, 0.61]*</td>
</tr>
<tr>
<td>Anger</td>
<td>1.89 [.73, 4.88]</td>
<td>.25* [1.4, 4.6]*</td>
</tr>
<tr>
<td>Sadness/Despair</td>
<td>0.43 [17, 1.08]</td>
<td>.06* [0.04, 0.09]*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Informational reception</th>
<th>Information seeking</th>
<th>Detailed experiences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hope</td>
<td>.83 [28, 247]</td>
<td>4.16* [2.93, 5.89]*</td>
</tr>
<tr>
<td>Fear</td>
<td>10.31* [1.23, 86.17]*</td>
<td>12.07* [3.14, 46.48]*</td>
</tr>
<tr>
<td>Humor</td>
<td>.00 [0.00, 1]</td>
<td>4.08* [1.62, 10.30]*</td>
</tr>
<tr>
<td>Anger</td>
<td>.00 [0.00, 1]</td>
<td>2.85* [1.47, 5.53]*</td>
</tr>
<tr>
<td>Sadness/Despair</td>
<td>.81 [19, 3.51]</td>
<td>11.33* [7.86, 16.33]*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emotional expression</th>
<th>Encouragement</th>
<th>Religion</th>
<th>Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hope</td>
<td>9.15* [6.23, 13.41]*</td>
<td>12.10* [5.80, 25.23]*</td>
<td>1.50* [66, 3.42]*</td>
</tr>
<tr>
<td>Fear</td>
<td>2.38 [26, 21.95]</td>
<td>8.51 [86, 3.83]*</td>
<td>15.72* [2.64, 93.69]*</td>
</tr>
<tr>
<td>Humor</td>
<td>.73 [0.9, 5.73]</td>
<td>.00 [0.00, 1]</td>
<td>.00 [0.00, 1]</td>
</tr>
<tr>
<td>Anger</td>
<td>1.17 [34, 4.03]</td>
<td>.83 [11, 6.33]</td>
<td>1.80 [58, 5.59]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emotional reception</th>
<th>Giving thanks</th>
<th>Empathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hope</td>
<td>1.82* [1.15, 2.88]*</td>
<td></td>
</tr>
<tr>
<td>Fear</td>
<td>.00 [0.00, 1]</td>
<td></td>
</tr>
<tr>
<td>Humor</td>
<td>4.29* [1.42, 12.95]*</td>
<td></td>
</tr>
<tr>
<td>Anger</td>
<td>.00 [0.00, 1]</td>
<td></td>
</tr>
<tr>
<td>Sadness/Despair</td>
<td>.22* [0.05, 0.91]*</td>
<td></td>
</tr>
</tbody>
</table>

Note. OR = odds ratio; CI = confidence interval.
*p < .05.
The third research question asked about the relationship between social support, emotional expression, and message sharing. In the sample, nearly all of the tweets (97.7%) were shared at least once via either the retweet or favorite mechanisms on Twitter. Mann–Whitney U-tests were used to see whether there was a significant difference between tweets that contained each element of social support and emotional expression based on the outcome of message sharing. This statistical test, a nonparametric test of differences between medians, was chosen because the continuous message-sharing variable did not meet the assumptions of normality required for parametric analysis (skewness = 15.55, kurtosis = 373.65).

In terms of types of social support associated with message sharing, tweets including detailed experiences were significantly less likely to be shared (Md = 3.53, n = 229) than were tweets without detailed experiences (Md = 4.07, n = 1,728), U = 163,236.00, z = −1.23, p < .001. Tweets including religious references were significantly less likely to be shared (Md = 3.48, n = 45) than were tweets without religious statements (Md = 3.97, n = 1,912), U = 35,176.00, z = −2.14, p < .05. Tweets including empathy were significantly less likely to be shared (Md = 3.48, n = 55) than were tweets without empathy (Md = 3.98, n = 1,902), U = 41,844.50, z = −2.58, p < .05. Tweets including information giving (U = 94,566.50, z = −1.54, p = .12), information seeking (U = 21,006.00, z = −.47, p = .64), encouragement (U = 115,467.00, z = −1.08, p = .28), giving thanks (U = 82,340.00, z = −.50, p = .62), and link presence (U = 440,514.50, z = −1.29, p = .20) did not differ significantly with regard to message sharing from tweets without those variables.

In terms of the emotional expression variables, tweets including expressions of sadness were significantly less likely to be shared (Md = 3.30, n = 206) than were tweets without expressions of sadness (Md = 4.18, n = 1,751), U = 119,436.50, z = −8.10, p < .001. Tweets including expressions of anger were significantly less likely to be shared (Md = 3.43, n = 61) than were tweets without anger expressions (Md = 3.98, n = 1,896), U = 46,770.50, z = −2.60, p < .01. Additionally, tweets including expressions of fear approached significance for being less likely to be shared (Md = 3.25, n = 10) than were tweets without fear expressions (Md = 3.96, n = 1,947), U = 6,658.00, z = −1.76, p = .08. Tweets including expressions of hope (U = 298,494.00, z = −4.8, p = .63) and humor (U = 26,085, z = −.63, p = .53) did not differ from tweets without hope and humor, respectively, based on message sharing frequency.

**Discussion**

This study makes multiple contributions to the literature on online social support for individuals affected in some way by cancer. First, it provides researchers with a typology of social support that can be applied to modern formats for expressing and receiving social support. Social support on Twitter is different from social support in dedicated online support groups because there is limited space (140 characters) to express support and Twitter users can very easily (and are encouraged to) share social support messages with others both in and outside of the cancer community (i.e., the rest of their social network). Therefore, it is important that research in this area recognize the unique technological affordances and constraints present in popular SNS sites. Future work could use experimental and longitudinal designs to test how each type and direction of online social support influences users who seek or give social support.

Related to the typology, another important contribution of this study is a reconceptualization of social support reception as an active, dynamic process that involves asking for support. Previous work had conceptualized this activity as passive reception, or reading, of support-giving messages. Based on empirical work about the use of social media spaces, we know that Internet users are not passive consumers of social media. By expanding the conceptualization of social support reception to be active, this study will hopefully spur additional research that addresses and tests the interactivity of Twitter and similar SNSs as spaces for social support.

Furthermore, the delineation of emotional expression as something separate from social support in an online interactive cancer community is a meaningful aspect of the present work. Previous research defined emotional support as empathetic messages, and empathy is a joint affective and cognitive process. Emotional expression, on the other hand, includes a wide range of discrete affective processes and does not always coincide with the provision of social support. Emotional expression may be used in the shortened space of Twitter to improve the chances someone will read a message. Expressions of feelings may also be used to foster social connections despite the limited number of characters per message.

This study also makes a contribution to the literature on computer-mediated social support by analyzing the links between emotional expression, social support, and message sharing. Easy message sharing (i.e., retweeting, favoriting) is a unique feature of modern social media compared to closed systems. Emotions spread quickly via these online social networks. The inclusion of emotional expression alongside cancer-related social support messages may help them reach wider audiences and may help support longer lasting networks wherein emotions can be shared freely and reciprocated, helping to build stronger bonds between users.

Specific findings from this study also merit discussion. In the present data, the most common type of social support was information expression, followed by information reception and emotional support expression, with emotional support reception representing the least common type of social support. All of the emotions measured in the present data were significantly and negatively related to link giving, possibly indicating that the limited space available in a microblogging network may force community members to choose between expressing their feelings and providing links to additional information. Emotional expression was also tied to various types of social support. Despite the inherent distress of the disease, hope was the most common and fear was the least common emotion expressed in this sample. This finding suggests that SNSs are a space where members of the cancer community are largely optimistic, perhaps inline with the trope of a cancer patient being a fighter (Achterberg,
Matthews-Simonton, & Simonton, 1977). Qualitative work could delve more richly into the purpose, benefits, and costs of different emotional expressions in this context.

In the sample described here, negative emotional expressions were linked with less message sharing, while there were no significant associations between positive emotions (hope and humor) and message sharing. Although the means for message sharing were higher when a Tweet included hope and/or humor, this finding was not significant. The finding that the expression of negative emotions makes a tweet about cancer less likely to be shared supports the stated proposition that the norm for discussions in a cancer community may be to remain as optimistic as possible. This finding also conforms to previous work that has found negative emotional content is less likely to be shared than positive content. Collectively, these findings underscore the necessity of studying the role of discrete emotions in order to fully understand the nature of this content and to form future hypotheses about its possible effects on SNS users.

Of the types of social support measured in this study, the inclusion of detailed information giving, religious references, and empathy predicted less message sharing, while other forms of social support reception and expression were not significantly related to message sharing. It is possible that these forms of social support prompted interactive replies (i.e., interpersonal communication) instead of message sharing to larger audiences. Future work could employ surveys and/or in-depth interviews to gain insights about the situations where Twitter users share messages versus reply to them. Additionally, one should consider that the lack of significance for these particular analyses could be the result of the use of nonparametric statistics, which are less powerful than parametric tests and therefore may have missed differences between groups (Pallant, 2010). Future work using larger samples or resulting in variables that meet assumptions of normality could help overcome this limitation.

It also important to note some limitations of the present work. Hashtags help build "ad hoc" publics—spaces where a diversity of experience and expertise can coexist around a topic of shared interest (Bruns & Burgess, 2011). As such, hashtag communities like #stupidcancer may be comprised of many types of individuals from patients, family members and friends, physicians, oncology specialists, and researchers, to members of the media and beyond. The role of individual perceptions, experiences, and motivations should be considered as research in this area advances. The findings here are also limited to one cancer network studied over a contained time period and therefore are not generalizable to all SNS-based cancer communities.

Despite these limitations, our findings have theoretical implications for the study of online forms of support, information seeking, and information sharing. For instance, models describing or predicting how members of the cancer community use SNS for social support would be wise to also include affective factors in their calculations. While many traditional models of health and communication behavior have glossed over or oversimplified the role of emotions, this study contributes to a growing body of literature demonstrating that discrete emotions have important and different effects on communication-related outcomes (Nabi, 1999, 2010). For cancer communication, in particular, discrete emotions are an important component of understanding which messages impact individuals (Dillard & Nabi, 2006).

Conclusion

SNSs like Twitter offer members of the cancer community the opportunity to connect with each other any time of day or night from nearly any place in the world. Given the importance of social support in dealing with the uncertainty, physical pain, and emotional strain that come along with a cancer diagnosis, it is important for health communication researchers to understand the nuances of this particular online cancer community. By analyzing 2 years of content from a popular Twitter-based cancer community, we were able to apply a newly proposed typology of the type and direction of social support to actual content. This research provides new insights into the nature of this content and its interconnectedness with SNS features like message sharing and the presence of hyperlinks and emotional expressions. As scholars have noted, social media platforms tend to be viewed as giant spheres where entire communities meet, rather than as what they are—a series of intricately woven and interconnected communities formed by individuals who have very specific needs, motivations, and expectations (Bruns & Moe, 2014). By utilizing new approaches that consider the distinct ways in which social media communities centered on cancer develop and thrive, scholars can begin to gain deeper insight as to the ways in which users turn to these spaces for social support.

This study developed one such approach, offering a direction that considers the connections between the types and direction of social support, emotional content, and message sharing in a cancer-focused social media space. Given that message sharing can amplify the reach and impact of health-related messages such as those analyzed here, it is likewise an important variable to study in the context of Twitter-based cancer communities, which continue to grow and evolve. The findings in this study provide a theoretical and empirical foundation for future work that could employ diverse methods to test the effects of the type, direction, and emotional tone of tweets about cancer. The widespread impact of this disease on individuals—of whom an increasing number turn to social media for information, guidance, and kinship—makes the study of online cancer communities an imperative and promising area of future research.

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References


