Implications of Fear, Anxiety, and Shame for Social Health Websites[1]

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Abstract

Health information seeking (HIS) and emotional support seeking (ESS) for medical conditions are wide-spread, self-guided online activities that happen concurrently on social health websites. Appraisal and coping theory suggests that these activities may be caused by negative emotions that users experience. In this paper, we examine three key negative emotions—fear, anxiety, and shame—for their potential impact on HIS and ESS. Through an online survey of 518 people, we found that out of the three emotions studied, only anxiety positively predicted HIS. In contrast, fear and anxiety both positively predicted ESS, while shame negatively predicted ESS. These findings result in important implications for social health websites. For example, our results suggest that people experiencing fear benefit from emotionally supportive comments and could be matched with other empathetic users.

Introduction

Health information seeking (HIS) has long been a major online activity (Pew Internet & American Life Project, 2011). Now the rise of social media has made it possible for people suffering from a medical condition to also go online for emotional support seeking (ESS). Social health websites like WebMD (www.webmd.com), MedHelp (www.medhelp.org), or sharecare (www.sharecare.com) provide for HIS and ESS at the same time. Users can mostly join an interactive online community that exists next to archived and static information. These sites are very popular: Over the last years, WebMD and MedHelp together have consistently had around 900 thousand unique visitors per day (http://trends.google.com/websites).

On social health websites, users can benefit both from others' knowledge and care. For example, PatientsLikeMe (www.patientslikeme.com) uses self-reported information to introduce patients to others that offer help, like people who have faced a similar situation or who are 'expert patients' (Brownstein, Brownstein, Williams, Wicks, & Heywood, 2009; Wicks et al., 2010). It was shown that users find PatientsLikeMe valuable to acquire information, but also to build lasting relations with others (Frost & Massagli, 2008; Wicks et al., 2010). HIS and ESS were found to be main activities on many other social health websites, in particular in online support communities (Coursaris & Liu, 2009; Greene, Choudry, Kilabuk, & Shrank, 2010; Kim, Oh, & Oh, 2008; Wang, Kraut, & Levine, 2012). These cases illustrate how the traditional one-way flow of information dissemination from experts (doctors, health / pharmaceutical organizations, health journalists) to laypeople (users and patients) has been blurred or replaced by interactive and interpersonal communication features.

Although we think that users can greatly benefit from getting both health information and emotional help from others, we also see some risk in this development. First, in this setup, users

need to evaluate various types of information and consider a lot of factors to pick the right content, such as credibility and motivation of the authors of comments, information value, emotional value, applicability to their own situation, etc. For design, it is not clear how to provide guidance to users regarding where and how to find what they are looking for, so users often have to sift through a mass of content themselves.

Second, users of social health websites who want to support others mostly do not receive recommendations where and how to do so. Helping others can be much more rewarding if one is put in touch with someone that appreciates one's support and if it is clearer what kind of help is needed. When people are diagnosed with a medical condition, they have many questions and a lot to contribute, but they need assistance in finding the right information and the right people.

Third, sometimes, the kind of support that a patient is looking for may not be available. For example, for patients suffering from new and unknown diseases, valid medical information might simply not exist. Searching websites for this information will be very frustrating for these users. However, potentially the site could compensate the lack of information with emotional help, e.g., by encouraging emotionally supportive answers in a support community and/or linking to them. While this is an interesting idea to enhance social health sites, we simply lack the understanding to do this effectively.

To advance existing social health websites, we need to understand what factors make people seek health information or emotional support. We argue that negative emotions are the key to differentially predict HIS and ESS. Prior research suggests that HIS and ESS are both coping strategies that people use to deal with the negative emotions they experience. Using this perspective, we analyzed the impact of three negative emotions – fear, anxiety, and shame – on

HIS and ESS. Based on data from an online survey, we modeled parallel, direct effects of fear, anxiety, and shame on HIS and ESS.

Empirically, (a) we found positive effects of anxiety on HIS and of both fear and anxiety on ESS, while shame had a negative effect on ESS, contrary to prior work (Herrald & Tomaka, 2002; Mortenson, 2006). (b) We also found that fear had a stronger positive effect on ESS than on HIS and that shame had a stronger negative effect on ESS than on HIS. These findings lend support to the following theoretical contributions: (a) We conceptualize HIS and ESS as strategies to cope with negative emotions. (b) We establish negative emotions as differential predictors of HIS and ESS through integration of emotion coping literature with research on HIS and ESS. Finally, this work offers important design implications. For example, we recommend connecting emotionally supportive support givers and content to users that suffer from a disease that is linked to fear. The same holds for users with a medical condition that evokes anxiety but for which little valid medical information is available.

Related Work and Hypotheses

Challenges of Current Health Websites

Our work applies to social health websites, i.e., sites offering means for both HIS and ESS. Often these sites provide some static editorial content (like articles on common medical conditions and health tips), but users can also join support communities that are mostly organized according to medical conditions. Yet, many social health sites rely completely on support communities and contain only little static information, e.g., on usage rules. Users commonly have to sign up to participate but the sizes of communities and how much active participation they require from users vary. For instance, Yahoo! Answers (http://answers.yahoo.com) offers a health section with a large, broad user community and easy sign-up, while PatientsLikeMe has interfaces specifically

designed for a few life-changing diseases and users need to enter extensive amounts of data for the site's matching systems to be effective. Social health websites are extremely popular. For instance, over the last 3 years, WebMD and MedHelp have consistently received around 700 and 200 thousand unique visitors per day respectively (http://trends.google.com/websites).

HIS has consistently been found to be the most dominant health-related online activity, and there is strong evidence that ESS, through social health websites, has become the second most important one, especially in support communities (Cline & Haynes, 2001; Coursaris & Liu, 2009; Fox, 2011; Frost & Massagli, 2008; Greene et al., 2010; Kim et al., 2008; Pew Internet & American Life Project, 2011; Wang et al., 2012; Wicks et al., 2010). Communities are useful features for social health websites, as they help users manage their medical condition and make them feel 'better informed,' while at the same time fostering social interactions and well-being (Barak, Boniel-Nissim, & Suler, 2008; Rains & Young, 2009; van Uden-Kraan, Drossaert, Taal, Seydel, & van de Laar, 2009). Another advantage of communities is that users sometimes prefer lay contributions, depending on the nature of the support they seek (Bernhardt & Felter, 2004). Moreover, in cases of terminal diseases, patients were observed to consciously reject HIS in favor of ESS (Brashers, Goldsmith, & Hsieh, 2002; Yeh & Chou, 2007). Other findings show that combining expression and reception of empathy can be optimal for patients to cope with severe diseases such as cancer (Han et al., 2011). ESS is almost impossible through static content, further underscoring the relevance of support communities on social health sites.

However, we also have indication that HIS and ESS translate into different requirements for users. For example, some patients reported online communities were useful for emotional support and empowerment, but they missed reliable information from experts (Kummervold et al., 2002). Members of a cancer support community sought less information the longer they were part

of the community while ESS became a more dominant strategy (Wang et al., 2012). This community might have 'run out of' useful answers for health information seekers, or such answers might have been difficult to find between comments of other patients that mainly had the purpose to support others emotionally. The mere existence of lay contributions, independent of their information quality, might decrease the perceived credibility of a health site for some users (Hu & Sundar, 2010).

If social health site designers do not provide means to filter through static information and support communities, this is bound to happen: emotionally supportive content clutters the site for health information seekers and vice versa. This is problematic, as users are not prepared to dig deep into the information provided and often stay on a site only for a short time (Eysenbach & Köhler, 2002). Moreover, users motivated to help others might not have an incentive to search for care seekers that would benefit most from their help. Overwhelming content (too much text, too detailed content lists) is likely to put users off (Williams, Nicholas, Huntington, & McClean, 2002).

On an ideal social health website, care seekers need only a few clicks to find the right type of support, while support givers get recommendations on how to help and whom to help. To limit the background information about users that is necessary for social health site designers to guide the user, it is our goal to analyze one factor that can account for both HIS and ESS differentially: negative emotions.

HIS and ESS as Strategies to Cope with Negative Emotions

Prior research suggests that HIS and ESS are both strategies to cope with negative emotion (e.g., Afifi & Morse, 2009; Broadstock & Borland, 1998; Carver, Scheier, & Weintraub et al., 1989; Coyne & Downey, 1991; Greenglass, Schwarzer, Jakubiec, Fiksenbaum, & Taubert, 1999;

Haley, Browne, Levine, & Bartolucci, 1987; Lambert & Loiselle, 2007; Rees & Bath, 2000, 2001; van der Molen, 1999). Other coping strategies include, e.g., planning, acceptance, or mental disengagement (Carver et al., 1989; Folkman & Lazarus, 1980; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986), but we focus on HIS and ESS as they are the most relevant ones online. Coping is multi-dimensional; that is, different coping strategies do not exclude each other even if they fulfill diverging purposes (e.g., Greenglass et al., 1999; Lazarus, 2006; Sideridis, 2006).

Appraisal and coping theory (Lazarus & Folkman, 1984) explains that people's coping strategies can be predicted through negative emotions. Negative emotions are short-lived, elaborated affective states, representing an individual's appraisal of their person-environment relationship in an adaptational response to some harm (Clore & Ortony, 2008; Lazarus, 2006; Nabi, 1999; Ortony, Clore, & Collins, 1988; Smith & Lazarus, 1990). While negative emotions are intertwined (e.g., Gray & Watson, 2007; Watson & Clark, 1997), appraisal theory establishes action tendencies that are specific to a distinct emotion and depend on the emotion's adaptive function (e.g., Afifi & Morse, 2009; Lerner & Keltner, 2000, 2001; Nabi, 1999; Smith & Lazarus, 1993). For example, when a person is angry, he or she tends to feel an impulse to take revenge (Lazarus, 2006). Differentiated appraisals and coping behaviors for discrete negative emotions could be confirmed in several studies (e.g., Herrald & Tomaka, 2002; Lerner & Keltner, 2000, 2001; Mortenson, 2006; Nabi, 2003; Saarni, 1997; Westen, 1994).

With this framework, we will be able to predict a coping strategy (i.e., HIS or ESS) through an emotion if we can relate this emotion's action tendency to the strategy. HIS consists of acquisition of knowledge about a specific problem or of obtaining confirmation and clarification (Baker & Connor, 1994; Barsevick & Johnson, 1990; Conley, 1998; Johnson, 1997). Thus an

emotion needs to have an action tendency that is geared towards fighting the medical condition through finding treatment information (instrumental information seeking), or towards clarifying and finding out about the threat as a goal in and of itself (exploration).

ESS is seeking expression and transaction of empathy, care, concern, affection, or interest from others (Burleson, 2003; Mickelson, 1997). Although ESS is a proactive and interactive strategy, it does not directly tackle the threat but rather the negative emotion itself (Barbee, Rowatt, Cunningham, Andersen, & Guerrero, 1998; Greenglass et al., 1999). This is based on the assertion that "the strategy of seeking [emotional] support seems to tap a primal need for human contact for reasons beyond whatever material aid, advice, or distraction that contact might provide" (Amirkhan, 1990, p. 1073). Hence, in order for an emotion to predict ESS, its action tendency has to drive the individual to approach others for the purpose of emotional relief from the negative emotion by means of social interaction (solace, Barbee et al., 1998). Implicitly, they might also seek for protection or distraction from the threat.

Fear, Anxiety, and Shame as Predictors of HIS and ESS

If we can establish differentiated effects of distinct negative emotions on HIS and ESS, social health website designers will be able to cater to different user needs more directly by recurring to the emotions that users typically experience. In this paper, we will focus on three emotions that are relevant in the context of coping with the diagnosis of medical conditions through HIS and ESS: fear, anxiety, and shame. First we discuss their adaptive functions and core relational themes; that is, the relational meanings that individuals attribute to the emotion, providing for an underlying constancy in coping reactions (Clore & Ortony, 2008; Lazarus, 2006; Smith & Lazarus, 1990, 1993). A negative emotion should trigger a need for instrumental information seeking or exploration in order to lead to HIS, and a need for solace to lead to ESS.

Fear

The core relational theme of fear is the confrontation of an immediate, concrete, overwhelming threat (Lazarus, 2006; Öhman, 2008). On the other hand, the threat is typically perceived as escapable (Mayne, 1999). This is in line with typical fear attributes of high effort and high situational control (Smith & Ellsworth, 1985), as well as high threat specificity (Sylvers, Lilienfeld, & LaPrairie, 2011). In general, fear appraisals and coping behaviors could be shown to be predictors of precautionary measures (Ruiter, Abraham, & Kok, 2001; Sime, 1976). For example, Borgers et al. (1993) find that cancer patients' self-guided HIS increased with fear. HIS can be one means to regulate fear by trying to avert the threat through finding information about cure and treatment (instrumental information seeking).

H1: Fear has a positive effect on HIS.

What is more, fear typically leads to protection, caution, the urge to defend oneself, but also to an attitude of action away from the environment and low self-responsibility (Frijda, 1986; Nabi, 2003; Öhman, 2008; Smith & Ellsworth, 1985; Sylvers et al., 2011). Fear leads to care seeking, in particular, if the person thinks he or she cannot overcome the threat by themselves (Mayne, 1999). We assert that these action tendencies lead patients to seek solace from others. Emotional support provides a direct relief from the immediate threat that they perceive. Directionality of action away from the threat and low self-responsibility let ESS seem better suited than HIS, as for ESS the threat does not have to be addressed directly – others can function as an emotional resort that is readily and quickly available. Accordingly, fearful cancer and HIV patients chose ESS as their primary coping strategy (Dunkel-Schetter, Feinstein, Taylor, & Falke, 1992; Leserman, Perkins, & Evans, 1992). This strong reliance on ESS was confirmed in direct

comparison to HIS: Patients suffering from terminal diseases that are associated with fear of death preferred the former over the latter (Brashers et al., 2002).

H2: Fear has a positive effect on ESS.

H3: Fear has a stronger effect on ESS than on HIS.

Anxiety

When individuals vaguely apprehend and anticipate an uncertain, existential danger, they feel anxiety (Lazarus, 2006; Öhman, 2008). Anxiety and fear overlap but, unlike fear, anxiety refers to a diffuse threat, future focus, and an approaching defensive direction (Öhman, 2008; Sylvers et al., 2011). 'Approaching' means that anxiety generally directs attention towards the threatening stimulus, to the extent that a person might not be able to disengage from it (Öhman, 2008). This leads people that feel anxiety to deal with their medical condition: Mayne (1999) summarizes that anxiety could often be related to preventive health behaviors and care seeking.

This ties into findings from the HIS literature. Anxiety was shown to have a positive effect on HIS, often in relation to uncertainty (Afifi, 2009; Afifi & Weiner, 2004, 2006; Diefenbach et al., 2008; Miller, Diefenbach, Krantz, & Baum, 1998; Turner, Rimal, Morrison, & Kim, 2006). To name one recent example, Fowler and Afifi (2011) find a direct effect on HIS for a context-specific anxiety measure. They applied a revised version of the theory of motivated information management (Afifi & Weiner, 2004) that explicitly incorporated appraisal and coping theory (Afifi & Morse, 2009). These findings hint to a strong effect of anxiety on HIS.

H4: Anxiety has a positive effect on HIS.

Few studies examined the direct effect of anxiety on ESS, so that we refer to findings for which it was implied that subjects felt this emotion. For example, looming death in case of terminal diseases evokes both high fear (specific threat) and high anxiety (future focus and uncertainty). As

mentioned for fear, in these scenarios, patients were reported to seek emotional support (Dunkel-Schetter et al., 1992; Leserman et al., 1992). Another stream of literature that has indirectly examined the effects of anxiety on ESS is attachment research (e.g., Simpson, Rholes, & Nelligan, 1992; Simpson, Rholes, Oriña, & Grich, 2002).

H5: Anxiety has a positive effect on ESS.

Overall, however, anxiety seems to relate most strongly to an urge to approach and find out about the threat. ESS promises relief but HIS directly addresses perceived uncertainty and the diffuse character of the threat (exploration), making the threat more specific and manageable.

H6: Anxiety has a stronger effect on HIS than on ESS.

Shame

Shame is evoked by an individual's perception of their self as defective and of a personal failure to live up to an 'Ego-ideal' (Lazarus, 2006; Tangney, Stuewig, & Mashek, 2007). Martens (2005) describes shame as "a fearful and chaotic sense of an irresistible and eerie revelation to self, of vulnerability in one's nature that, by indicating one's moral incompetence, isolates and humbles one in the face of what one regards as a sacred community" (p. 400).

The same author (Martens, 2005) specifies shame's action tendencies as efforts to avoid or diminish the negative effects of the individual's self-blame. Several others (e.g., Dearing, Stuewig, & Tangney, 2005; Silfver, 2007; Verbeke & Bagozzi, 2002) point to the difficulty of turning this into active coping; shame is inherently past-oriented and offers little hope for redemption – "It is a daunting challenge to transform a self that is defective at its core" (Tangney et al., 2007, p. 353). As a result, shame leads to attempts to deny, hide, or escape its cause (Tangney et al., 2007).

Given these strong tendencies of denial, HIS might not be the primary choice to deal with shame: Both exploration and instrumental information seeking would force the individual to

actively deal with their defective self. Shame might rather be a negative emotion that leads to 'blunting,' i.e., avoiding and distancing from information about the threat (e.g., Miller, 1979; Rees & Bath, 2001).

H7: Shame has a negative effect on HIS.

Herrald and Tomaka (2002) and Mortenson (2006) find that shame leads to ESS. However, in both studies shame was assessed through self-reported perceptions of participants' embarrassment about their behavior and not in relation to their perception of a defective self, so that participants might have actually felt guilt and not shame (Tangney et al., 2007). The effect for shame was opposite for people suffering from medical conditions (Mickelson, 1997; Thomas et al., 2010) and for caregivers of stigmatized persons (Kittikorn, Street, & Blackford, 2006). Similarly, withdrawal from others, self-blame (or 'attack self'), and denial were established as immediately shame-related coping strategies (Reid, Harper, & Anderson, 2009; Tangney et al., 2007; Westen; 1994; Yelsma, Brown, & Elison, 2002). Withdrawal, intuitively, has a negative relation to ESS, and self-blame was confirmed to negatively correlate to ESS by Greenglass et al. (1999). Shame was also shown to disrupt an individual's ability to have empathetic relations (Tangney et al., 2007).

H8: Shame has a negative effect on ESS.

Prior work explicitly linked shame to withdrawal and self-blame (e.g., Tangney et al., 2007), which are both negatively related to ESS. Therefore, shame is likely to have a strong negative effect on ESS. For HIS, the effect seems smaller. HIS could be more useful due to its fairly low social and emotional involvement. For example, shame can lead to indirect social support seeking (Williams & Mickelson, 2008), which HIS might better represent than ESS.

H9: Shame has a stronger negative effect on ESS than on HIS.

Method

Procedure

We collected our data through an online survey on Amazon's Mechanical Turk (www.mechanicalturk.com). Mechanical Turk is a micro-task marketplace on which users can complete evaluative tasks for pay. Data from Mechanical Turk surveys has been shown to be just as reliable as data obtained through common methods (Buhrmester, Kwang, & Gosling, 2011).

A major goal was to yield results that are broadly sustainable, independent of context and a specific medical condition. Therefore, we administered a pre-survey (N_p = 151) on Mechanical Turk, asking subjects about their negative emotions for 15 common medical conditions. We identified 6 medical conditions (Alzheimer's disease, arthritis, bone fracture, common warts, dandruff, and genital herpes) that would yield sufficient variance in the emotion scales. By asking a broad sample of subjects about several specific medical conditions, we hope to reconcile the need of context-specificity and person-centered approaches (Lazarus, 2006) and calls for generalizability and transcendence of context limitations (Kahlor, 2010).

In order to measure state emotions and associated coping strategies, we needed to simulate the mental process after diagnosis. We felt that asking subjects about past experiences would not work, as they would have already dealt with the respective medical condition or might have never had it. Therefore, we assigned participants randomly to one of the 6 medical conditions. We then asked subjects to imagine the hypothetical situation of being diagnosed with this condition. To increase salience, participants also had to write a short essay on how it would be for them to be diagnosed and live with the condition. For all items, we then asked participants to envision the moment in which they have just found out that they have the medical condition.

Participants

659 participants started the main survey, out of which 609 completed it. The average completion time was about 19 minutes. Loosely based on Huang, Curran, Keeney, Poposki, and DeShon (2011, in press), 91 cases were erased from the sample as the answers either clearly showed that subjects had not read the instructions (reversed test items were answered very inconsistently) or that they had rushed through the survey (completion time below 9 minutes). This leaves a sample size of $N = 518$. As is typical for Mechanical Turk users, the sample was fairly diverse (see Table 1 for selected demographics).

<< Insert Table 1 about here >>

Measurement

All items were measured on 7-point Likert-type scales from "strongly disagree" to "strongly agree." Fear was measured through 4 items from Pauls and Stemmler (2003) and Watson (1994), Cronbach's alpha (α) = .927. Anxiety was assessed through the state form of the State-Trait Anxiety Index (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), α = .964. Shame was adapted from the Compass of Shame Scale (Elison, Lennon, & Pulos, 2006; Elison, Pulos, & Lennon, 2006), α = .938. HIS was assessed through a 3-item scale adapted from Kahlor (2010), α = .889. ESS was based on a 5-item scale from Amirkhan (1990), α = .914. The survey instrument including all variables can be found in the appendix. Descriptive statistics for the emotion variables in total and grouped by the 6 medical conditions can be found in Table 2.

<< Insert Table 2 about here >>

Results

We applied structural equation modeling to analyze effects on two dependent variables. We used the statistical software AMOS to run latent-variable structure modeling. Maximum

likelihood estimation was used to estimate parameters. Our model (see Figure 1) includes all paths from fear, anxiety, and shame to HIS and ESS. Thus, for each effect that an emotion has on HIS or ESS, the other two emotions are controlled for. A covariance path for each emotion pair was included to account for their interrelatedness. This setup represents situations where fear, anxiety, and shame occur concurrently. We report satisfactory fit of the model for our data (RMSEA = .073, CI 90 % [.069, .0.77], *p*-close = .000; CFI = .923; NFI = .898). Fear, anxiety, and shame explained 21.8 % of the variance in HIS and 20.7 % of the variance in ESS.

<< Insert Figure 1 about here >>

Direct Effects of Emotions

We note that the effect of anxiety on HIS and the effects of fear, anxiety, and shame on ESS are significant and in the predicted direction (H2, H4, H5, and H8 supported). Fear had a positive non-significant effect on HIS ($.05 < p < .1$, H1 rejected) and shame had a negative non-significant effect on HIS ($.05 < p < .1$, H7 rejected).

Comparisons Holding Emotions Constant

To test the remaining hypotheses, we carried out pairwise comparisons of χ^2 model fit by constraining the regression weights for the two paths from a given emotion to HIS or ESS to the same weight. This constraint decreases model fit while the degrees of freedom (df) increase by 1. Although χ^2 goodness of fit is not an appropriate measure of absolute model fit for our sample size (e.g., Kenny, 2011), it is the most useful measure to assess significance of the difference in fit of two models. The difference between the constrained and the unconstrained models' χ^2 values can be tested for significance at df = 1. Table 3 displays the χ^2 fit values for the baseline and constrained models, and also the χ^2 differences. These values do not indicate the valence of χ^2 differences, but for this we can refer to the regression weights in Figure 1.

<< Insert Table 3 about here >>

Fear has a stronger effect on ESS than on HIS ($p < .05$, H3 supported). The difference between the effects of anxiety on HIS and ESS points in the opposite than hypothesized direction and is not significant ($p > .1$, H6 rejected). The negative effect of shame on ESS is significantly larger than for HIS ($p < .001$, H9 supported).

Discussion

Our results confirmed the importance of negative emotions for HIS and ESS as coping strategies. What is more, we were able to illustrate the differential influences that emotions can have: An emotion can have different effects on HIS and ESS.

Fear

In detail, we find that when people feel fear, ESS is the main way for them to deal with the emotion. This is in line with findings on the needs of people with terminal diseases (e.g., Brashers et al., 2002; Han et al., 2011; Yeh & Chou, 2007). When fear is high, information and knowledge about future solutions (i.e., instrumental information seeking and exploration) are probably not helpful as the threat is perceived as overwhelming and immediate. Seeking solace, directly addressing the emotion instead of the threat, offers the more swift response to fear.

Anxiety

For anxiety, we suspect that uncertainty plays a role. Next to the instrumental information seeking purpose of HIS (e.g., finding treatment), its exploration aspect comes into play. In turn, ESS provides complementary, immediate relief of anxiety through solace. There is no reason for the individual not to pursue several strategies in parallel, and for an uncertain and diffuse but also intense threat, both HIS and ESS work. This confirms that anxiety overall leads to adaptive and preventive behavior (Mayne, 1999). We also see the multi-dimensionality of coping confirmed

(e.g., Greenglass et al., 1999; Lazarus, 2006; Sideridis, 2006); different coping strategies do not exclude each other even if they have different purposes at the outset.

Given that anxiety should trigger both functions of HIS (instrumental information seeking and exploration), it is surprising that it had a slightly stronger effect on ESS. We conclude that ESS is a powerful strategy to deal with intense emotion, as it addresses the emotion directly. Evolutionary artifacts seem to let the individual see emotional support as just as desirable as information, although the former does less to solve the actual problem.

Contrary to prior work (e.g., Westen, 1994), we were able to carve out some differences between fear and anxiety However, we also note that, all in all, fear and anxiety were similar in evoking HIS and ESS in our results. This could be due to the imprecision of a self-report survey: The items for fear and anxiety that we used may be indistinguishable to the participant. Prior research identifies both overlaps and differences of fear and anxiety (Öhman, 2008; Sylvers et al., 2011). Our findings highlight that future work should identify medical conditions and treatment stages for which there is a pronounced difference between fear and anxiety, as these emotions can lead to different coping strategies.

Shame

Shame is a particular case in many ways. In the case of shame, self-blame and withdrawal from others are so strong that ESS strongly decreases. The absolute negative effect of shame on ESS is the strongest effect we find for all emotions, and also its difference towards shame's non-significant negative effect on HIS is the largest in our results.

Fundamentally, our analysis of shame reveals that generalizing negative affect in the context of health conditions can lead to flawed conclusions. A discrete negative emotion does not

always lead to active and adaptive coping behavior, and prior research that is based on broader notions of affective responses to a threat (e.g., Kahlor, 2010) cannot account for this.

Moreover, prior work that has conceptualized shame in different contexts (e.g., Herrald & Tomaka, 2002; Mortenson, 2006) and found a positive effect of shame on ESS should not be applied to medical conditions. We conclude from our results that shame because of a medical condition is not what an individual feels regarding their behavior that they feel guilty about; shame relates to the patient's perception of their defective self (Tangney et al., 2007). Therefore, the individual might see their situation as hopeless and seeking behavior as futile.

The particular social aspect of shame and its specific function of withdrawal lead to ESS not being an option for patients. This also means that ESS, in the case of shame, does not seem to have the potential to serve the purpose of solace. In fact, the action tendency of shame is not towards averting the threat, i.e., the medical condition, but towards averting social rejection and embarrassment. ESS is just the opposite of helpful to achieve this, as the individual explicitly does not want others to be aware and empathetic about their problem. Talking about the shameful disease might only confirm the defective self in the eyes "of what one regards as a sacred community" (Martens, 2005, p. 400). The goal becomes denial and emotional distancing from the defective self, and ESS would reach the contrary.

One way to counter these problematic results for shame could lie in ESS efficacy. For instance, in the context of obesity, for which people might perceive that they can proactively change their situation, shame led to engagement with the problem and decreasing shame to avoiding it (Conradt et al., 2008). When we regressed ESS on the three emotions and controlled for ESS efficacy (i.e., addition of ESS response and ESS self efficacy, measures based on Kahlor, 2010, $F(4,513) = 129.927$, $p < .001$, $R^2 = .503$), the negative effect of shame was still significant

($p < .001$), but the standardized beta coefficient of ESS efficacy, in absolute terms, was more than twice as high ($\beta = .590$) as the one of shame ($\beta = -.219$). This calls for research examining for which medical conditions people experience shame but at the same time think that they can do something about the threat (efficacy), and for ways to infuse ESS efficacy.

Moreover, future studies should analyze the social burden of different types of support seeking for shameful diseases, and to what extent it is lower in the online world, e.g., through anonymity. Our result of no significant negative effect of shame on HIS suggests that a patient experiencing this emotion might not engage in coping strategies with lower socio-emotional involvement proactively, but that it might at least be easier to promote them. This can also be related to findings showing that shame decreases direct social support seeking but that it can increase indirect social support seeking (Williams & Mickelson, 2008).

Practical Implications

Facilitating Emotional Support for Users Experiencing Fear

The link between specific negative emotions and HIS and ESS is useful for social health websites, as it allows designers to cater to specific user needs while requiring limited information to do so. In more detail, individuals that experience fear should not be overwhelmed with information about their condition. In a first step, they need to find comfort and solace to attenuate the negative emotion caused by the immediate threat. Therefore, patients that typically experience fear should be guided to emotionally supportive comments in a community. This could be combined with a simple rating system; community members could not only indicate the informational value of an answer, but be asked to indicate emotional value, too. This would be in line with Kim et al. (2008), who found that users of the health section of Yahoo! Answers estimated the utility and socio-emotional values of answers the highest.

This finding can also improve the experience of users of social health websites who want to help others. These users are likely to be intrinsically motivated and have the urge to help others, maybe because they are suffering from a disease themselves. This opens up a great opportunity for site designers: If they can guide users that want to support others to the people and questions that require their help, support seekers are likely to appreciate the help they receive more, which, in turn, will make the support giver's experience more rewarding as well. Empirical evidence confirms that the combination of receiving and giving empathetic behavior is most beneficial to cope with a severe disease (Han et al., 2011), so that emotional support givers would directly benefit as well. For instance, those who have proven to be empathetic and to show understanding and interest for other community members (e.g., based on the ratings of emotional value of their comments through the user community) can be linked to patients that have indicated that they have just been diagnosed with a disease that evokes fear. An exemplary medical condition for these findings might be Alzheimer's disease, as our sample indicates that its diagnosis triggers fear in particular while shame is moderate (see Table 2).

Guiding Users Experiencing Anxiety Based on Support Availability

If people feel anxiety as a result of their medical condition, they are willing to seek both information and emotional support. As a result, guidance for these users is more flexible and can focus, for instance, on relevancy rather than on the type of support provided. For design, this means that patients experiencing anxiety should receive means to specify their needs and then be given the choice between different kinds of content. These users have a tendency to explore so that recommendations and guidance should not be overly intrusive.

This might be different, however, if one type of support is unavailable: Our findings for anxiety also implicate that social health websites can make use of their flexibility to intervene in

the seeking process. For example, if quick treatment is beneficial (e.g., for a virus infection), the site can link a person feeling anxiety to precise treatment information (or suchlike posts in communities) as the user is willing to accept this. On the other hand, if good information is not available (e.g., in case of a new or complex disease), patients can be presented with emotionally supportive messages in response to their questions, as they will also seek this kind of support and it is likely to at least provide solace for them.

Enhancing Seeking Efficacy for Users Experiencing Shame

From the negative effects of shame on HIS and ESS, we conclude that other decision factors need to be fostered that outmatch shame's effect. One way is to increase these users' seeking efficacy; that is, make them apprehend that help can be found and that they, themselves, are able to access it. Potentially, this effort needs to begin before users actually enter a health site: Doctors could tell patients with diseases that are typically shameful that health information and emotional support is easily available online, and possibly recommend social health sites.

Conflicting Effects of Negative Emotions

We also find that, in all cases, several emotions need to be assessed in parallel. For example, anxiety requires less careful design, as several coping strategies might work, but should a person experience high fear and low anxiety, they are likely to refrain from sites that do not provide emotional support promptly. This could become a problem in the scenario where quick information and treatment would be helpful to the user but their fear keeps them from finding it because they overly rely on ESS. In these cases, the individual could be guided towards emotional support first, e.g., to other empathetic users or encouraging comments, and in a second step specific information on treatment could be promoted visually next to these exchanges.

When we link this to the medical conditions we examined as examples, e.g., the case of arthritis is relatively straightforward as anxiety is high, fear is moderate, and shame is low (see Table 2) – arthritis patients are likely to engage in both HIS and ESS. More problematic, for instance, could be genital herpes, for which all three emotions are high. Patients might feel inner conflict; their adaptive reaction to the disease might make them want to seek support, but 'fear of rejection' from others evoked by shame can dominate and lead to isolation and lacking HIS and ESS. User guidance on social health sites needs to account for these conflicts.

Limitations

There are several limitations to our study. One of the challenges that we did not address but that is important to fully leverage our findings is how to assess emotions on a social health website. One way is to simply have users fill in a brief survey, but this intrusion can also annoy them and make them leave the site. We suggest that social health website design make use of the appraisal and coping framework again: Negative emotions are interwoven with perceptions of the threat, i.e., of the medical condition. For instance, an assessment of the negative emotions typically related to a medical condition through an online survey, as done in this paper, could help to at least clarify broad differences in usage patterns across patients and disease communities. Precisely mapping a disease and treatment stage onto typically experienced emotions should thus be a goal of future research. To be clear, we are not suggesting that HIS or ESS should be coerced upon any user, as we are aware that many other factors come into play. Yet, emotions tied to threat perceptions, in our view, might be powerful and efficient predictors of HIS and ESS that help to implement guiding suggestions and recommendations to users.

Second, effect sizes need to be taken into consideration. Although we mostly find strong and robust effects, of course, the emotions we examined do not always lead precisely and only to

the coping strategy we predict. The variance that fear, anxiety, and shame could explain was around 20 % for both HIS and ESS. We are aware that a multitude of other factors matter that might overturn (or enhance) an emotion's effect on HIS and ESS. There are good reasons to examine more holistic models that account for more factors. However, we feel that our results are powerful enough to derive implications for recommendation and guidance features that a site can provide to users. Moreover, future research might find it worthwhile to integrate our conceptualization of negative emotions based on coping theory into larger models.

Third, we were not in the position to survey people that were actually diagnosed with a medical condition. Therefore, we had to ask participants to imagine that they were diagnosed with an arbitrary common medical condition. This limits the generalizability of our findings: Things might be different in situations in which decisions about actual coping strategies have to be made, e.g., including consideration of the cost of every strategy.

Our results are also limited with regard to the idiosyncrasies of medical conditions. For example, familiarity might play a role and reactions to negative emotions be different if a person is faced with a disease that they do not know. Another example is an individual's categorization of a threat as a medical condition: For instance, in our pretests, several participants said that they did not consider obesity a medical condition; a perception which might completely change users' approach so that we excluded it. These cases show that there might be other confounds stemming from our selection of medical conditions, although we are unaware of any at this point.

Finally, we should note the persisting limitations of online surveys in general and Mechanical Turk samples in particular (e.g., no certainty about causation, professional survey takers, uncertainty about the truthfulness of answers, low attention and effort, etc.).

Conclusion

Negative emotions have differentiated effects on coping strategies such as HIS and ESS. Therefore, they imply a huge potential for the design of social health websites as efficient indicators of user needs. Our paper analyzed fear, anxiety, and shame and found meaningful differences between a given emotion's effects on HIS and ESS. More research is required, e.g., on the interrelation of these emotions with other negative emotions and with other predictors of HIS and ESS such as efficacy, as well as on the intertwinement of medical conditions with negative emotions. We are confident that our study was successful in making the case for the use of negative emotions as insightful concepts, and that they will be further apprehended by health technology and health communication researchers and designers in the near future.

References

Afifi, W. A., & Morse, C. R. (2009). Expanding the role of emotion in the Theory of Motivated Information Management. In T. D. Afifi & W. A. Afifi (Eds.), *Uncertainty, information management, and disclosure decisions: Theories and applications* (pp. 87-105). New York: Routledge.

Afifi, W. A. (2009). Uncertainty and information management in interpersonal contexts. In S. W. Smith & S. R. Wilson (Eds.), *New directions in interpersonal communication* (pp. 94-114). Thousand Oaks, CA: Sage Publications.

Afifi, W. A, & Weiner, J. L. (2004). Toward a Theory of Motivated Information Management. *Communication Theory, 14*(2), 167-190. Retrieved from http://dx.doi.org/10.1111/j.1468-2885.2004.tb00310.x

Afifi, W. A, & Weiner, J. L. (2006). Seeking Information About Sexual Health: Applying the Theory of Motivated Information Management. *Human Communication Research, 32*(1), 35-57. Retrieved from http://dx.doi.org/10.1111/j.1468-2958.2006.00002.x

Amirkhan, J. H. (1990). A Factor Analytically Derived Measure of Coping: The Coping Strategy Indicator. *Journal of Personality and Social Psychology, 59*(5), 1066-1074. doi:10.1037/0022-3514.59.5.1066

Baker, L. M., & Connor, J. J. (1994). Physician-Patient Communication from the Perspective of Library and Information Science. *Bulletin Medical Library Association, 82*(1), 36-42.

Barak, A., Boniel-Nissim, M., & Suler, J. (2008). Fostering Empowerment in Online Support Groups. *Computers in Human Behavior, 24*(5), 1867-1883. doi:10.1016/j.chb.2008.02.004

Barbee, A. P., Rowatt, T. L., & Cunningham, M. R. (1998). When a friend is in need: Feelings about seeking, giving, and receiving social support. In P. A. Andersen & L. K. Guerrero (Eds.), *Handbook of communication and emotion: Research, theory, applications, and contexts.* (pp. 281-301). San Diego, CA: Academic Press. Retrieved from http://psycnet.apa.org/psycinfo/1997-36344-009

Barsevick, A. M., & Johnson, J. E. (1990). Preference for information and involvement, information seeking and emotional responses of women undergoing colposcopy. *Research in Nursing & Health, 13*(1), 1-7. doi:10.1002/nur.4770130103

Bernhardt, J. M., & Felter, E. M. (2004). Online Pediatric Information Seeking Among Mothers of Young Children: Results From a Qualitative Study Using Focus Groups. *Journal of Medical Internet Research, 6*(10), e7. Retrieved from http://www.jmir.org/2004/1/e7/

Borgers, R., Mullen, P. D., Meertens, R., Rijken, M., Eussen, G., Plagge, I., Visser, A. P., et al. (1993). The Information-Seeking Behavior of Cancer Outpatients: A Description of the

Situation. *Patient Education and Counseling*, *22*(1), 35-46. doi:10.1016/0738-3991(93)90087-D

Brashers, D. E., Goldsmith, D. J., & Hsieh, E. (2002). Information Seeking and Avoiding in Health Contexts. *Human Communication Research*, *28*(2), 258-271. Retrieved from http://dx.doi.org/10.1111/j.1468-2958.2002.tb00807.x

Broadstock, M., & Borland, R. (1998). Using information for emotion-focused coping: Cancer patients' use of a cancer helpline. *British Journal of Health Psychology*, *3*(Part 4), 319-332. United Kingdom: British Psychological Society. Retrieved from http://search.proquest.com/docview/619368953?accountid=12598

Brownstein, C. A., Brownstein, J. S., Williams, D. S., Wicks, P., & Heywood, J. A. (2009). The Power of Social Networking in Medicine. *Nature Biotechnology*, *27*(10), 888-890. doi:10.1038/nbt1009-888

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data? *Perspectives on Psychological Science*, *6*(1), 3-5. doi:10.1177/1745691610393980

Burleson, B. R. (2003). Emotional support skills. In B. R. Burleson & J. O. Greene (Eds.), *Handbook of communication and social interaction skills.* (pp. 551-594). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing Coping Strategies: A Theoretically Based Approach. *Journal of Personality and Social Psychology*, *56*(2), 267-283. doi:10.1037/0022-3514.56.2.267

Cline, R. J. W., & Haynes, K. M. (2001). Consumer Health Information Seeking on the Internet: The State of the Art. *Health Education Research*, *16*(6), 671-692. doi:10.1093/her/16.6.671

Clore, G. L., & Ortony, A. (2008). Appraisal theories: How cognition shapes affect into emotion. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 628-642). New York, NY: Guilford Press.

Conley, V. M. (1998). Beyond Knowledge Deficit to a Proposal for {Information-Seeking} Behaviors. *International Journal of Nursing Terminologies and Classifications*, *9*(4), 129-135. doi:10.1111/j.1744-618X.1998.tb00182.x

Conradt, M., Dierk, J.-M., Schlumberger, P., Rauh, E., Hebebrand, J., & Rief, W. (2008). Who Copes Well? Obesity-Related Coping and Its Associations with Shame, Guilt, and Weight Loss. *Journal of Clinical Psychology*, *64*(10), 1129-1144. doi:10.1002/jclp.20501

Coursaris, C. K., & Liu, M. (2009). An Analysis of Social Support Exchanges in Online HIV/AIDS Self-Help Groups. *Computers in Human Behavior*, *25*(4), 911-918. doi:10.1016/j.chb.2009.03.006

Coyne, J. C., & Downey, G. (1991). Social Factors and Psychopathology: Stress, Social Support, and Coping Processes. *Annual Review of Psychology*, *42*(1), 401. doi:Article

Dearing, R., Stuewig, J, & Tangney, J. (2005). On the Importance of Distinguishing Shame from Guilt: Relations to Problematic Alcohol and Drug Use. *Addictive Behaviors*, *30*(7), 1392-1404. doi:10.1016/j.addbeh.2005.02.002

Diefenbach, M. A., Miller, S. M., Porter, M., Peters, E., Stefanek, M., & Leventhal, H. (2008). Emotions and health behavior: A self-regulation perspective. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 645-660). New York, NY: Guilford Press.

Dunkel-Schetter, C., Feinstein, L. G., Taylor, S. E., & Falke, R. L. (1992). Patterns of Coping with Cancer. *Health Psychology*, *11*(2), 79-87. doi:10.1037/0278-6133.11.2.79

Elison, J., Lennon, R., & Pulos, S. (2006). Investigating The Compass Of Shame: The Development Of The Compass Of Shame Scale. *Social Behavior and Personality: an international journal*, *34*(3), 221-238. doi:10.2224/sbp.2006.34.3.221

Elison, J., Pulos, S., & Lennon, R. (2006). Shame-Focused Coping: An Empirical Study Of The Compass Of Shame. *Social Behavior and Personality: an international journal*, *34*(2), 161-168. doi:10.2224/sbp.2006.34.2.161

Eysenbach, G., & Köhler, C. (2002). How Do Consumers Search for and Appraise Health Information on the World Wide Web? Qualitative Study Using Focus Groups, Usability Tests, and In-Depth Interviews. *BMJ*, *324*(7337), 573-577. doi:10.1136/bmj.324.7337.573

Folkman, S., & Lazarus, R. S. (1980). An Analysis of Coping in a Middle-Aged Community Sample. *Journal of Health and Social Behavior*, *21*(3), 219-239. Retrieved from http://www.jstor.org/stable/2136617

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a Stressful Encounter: Cognitive Appraisal, Coping, and Encounter Outcomes. *Journal of Personality and Social Psychology*, *50*, 992-1003. doi:10.1037/0022-3514.50.5.992

Fowler, C., & Afifi, W A. (2011). Applying the Theory of Motivated Information Management to Adult Children's Discussions of Caregiving with Aging Parents. *Journal of Social and Personal Relationships*, *28*(4), 507-535. doi:10.1177/0265407510384896

Fox, S. (2011). *Peer-to-peer healthcare*. *Pew Research Center*. Retrieved from http://pewinternet.org/Reports/2011/P2PHealthcare.aspx

Frijda, N. H. (1986). *The emotions*. New York, NY: Cambridge University Press; Editions de la Maison des Sciences de l'Homme.

Frost, J. H., & Massagli, M. P. (2008). Social Uses of Personal Health Information Within PatientsLikeMe, an Online Patient Community: What Can Happen When Patients Have Access to One Another's Data. *Journal of Medical Internet Research*, *10*(3), e15. doi:10.2196/jmir.1053

Gray, E. K., & Watson, D. (2007). Assessing positive and negative affect via self-report. In J. A. Coan & J. J. B. Allen (Eds.), *Handbook of emotion elicitation and assessment* (pp. 171-183). New York, NY: Oxford University Press.

Greene, J., Choudhry, N., Kilabuk, E., & Shrank, W. (2010). Online Social Networking by Patients with Diabetes: A Qualitative Evaluation of Communication with Facebook. *Journal of General Internal Medicine*, *26*(3), 287-292. Springer New York. doi:10.1007/s11606-010-1526-3

Greenglass, E., Schwarzer, R., Jakubiec, D., Fiksenbaum, L., & Taubert, S. (1999). The Proactive Coping Inventory. *International Conference of the Stress and Anxiety Research Society (STAR)*. Cracow, Poland. Retrieved from http://www.psych.yorku.ca/greenglass/pci.doc

Haley, W. E., Levine, E. G., Brown, S. L., & Bartolucci, A. A. (1987). Stress, Appraisal, Coping, and Social Support as Predictors of Adaptational Outcome Among Dementia Caregivers. *Psychology and Aging*, *2*(4), 323-330. doi:10.1037/0882-7974.2.4.323

Han, J. Y., Shah, D. V., Kim, E., Namkoong, K., Lee, S.-Y., Moon, T. J., Cleland, R., et al. (2011). Empathic Exchanges in Online Cancer Support Groups: Distinguishing Message Expression and Reception Effects. *Health Communication*, *26*(2), 185-197. doi:10.1080/10410236.2010.544283

Herrald, M. M., & Tomaka, J. (2002). Patterns of Emotion-Specific Appraisal, Coping, and Cardiovascular Reactivity During an Ongoing Emotional Episode. *Journal of Personality and Social Psychology*, *83*(2), 434-450. doi:10.1037/0022-3514.83.2.434

Hu, Y., & Sundar, S. S. (2010). Effects of Online Health Sources on Credibility and Behavioral Intentions. *Communication Research*, *37*(1), 105-132. Retrieved from http://crx.sagepub.com/content/37/1/105.abstract

Huang, J. L., Curran, P. G., Keeney, J., Poposki, E. M., & DeShon, R. P. (2011). Detecting and Deterring Insufficient Effort Responding to Surveys. *Journal of Business and Psychology*. doi:10.1007/s10869-011-9231-8

Huang, J. L., Curran, P. G., Keeney, J., Poposki, E. M., & DeShon, R. P. (n.d.). Detecting and Deterring Insufficient Effort Responding to Surveys. *Journal of Business and Psychology*. doi:10.1007/s10869-011-9231-8

Johnson, J. (1997). *Cancer-related information seeking*. Cresskill, NJ: Hampton Press.

Kahlor, L. (2010). PRISM: A Planned Risk Information Seeking Model. *Health Communication*, *25*(4), 345-356. Retrieved from http://www.informaworld.com/10.1080/10410231003775172

Kenny, D. A. (2011). Measuring model fit. Retrieved October 25, 2011, from http://www.davidakenny.net/cm/fit.htm

Kim, S., Oh, S., & Oh, J. S. (2008). Evaluating Health Answers in a Social Q&A Site. *Proceedings of the American Society for Information Science and Technology*, *45*(1), 1-6. Wiley Subscription Services. doi:10.1002/meet.2008.14504503134

Kittikorn, N., Street, A. F., & Blackford, J. (2006). Managing Shame and Stigma: Case Studies of Female Carers of People With AIDS in Southern Thailand. *Qualitative Health Research*, *16*(9), 1286-1301. doi:10.1177/1049732306293992

Kummervold, P. E., Gammon, D., Bergvik, S., Johnsen, J. K., Hasvold, T., & Rosenvinge, J. H. (2002). Social Support in a Wired World: Use of Online Mental Health Forums in Norway. *Nordic Journal of Psychiatry*, *56*(1), 59-65. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11869468

Lambert, S. D., & Loiselle, C. G. (2007). Health Information-Seeking Behavior. *Qualitative Health Research*, *17*(8), 1006-1019. Retrieved from http://qhr.sagepub.com/content/17/8/1006.abstract

Lazarus, R. S. (2006). Emotions and Interpersonal Relationships: Toward a Person-Centered Conceptualization of Emotions and Coping. *Journal of Personality*, *74*(1), 9-46. doi:10.1111/j.1467-6494.2005.00368.x

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.

Lerner, J. S., & Keltner, D. (2000). Beyond Valence: Toward a Model of Emotion-Specific Influences on Judgement and Choice. *Cognition & Emotion*, *14*(4), 473-493. Retrieved from http://www.informaworld.com/10.1080/026999300402763

Lerner, J. S., & Keltner, D. (2001). Fear, Anger, and Risk. *Journal of Personality and Social Psychology*, *81*(1), 146-159. doi:10.1037/0022-3514.81.1.146

Leserman, J., Perkins, D. O., & Evans, D. L. (1992). Coping with the Threat of AIDS: The Role of Social Support. *The American Journal of Psychiatry*, *149*(11), 1514-1520.

Martens, W. (2005). A Multicomponential Model of Shame. *Journal for the Theory of Social Behaviour*, *35*(4), 399-411. doi:10.1111/j.1468-5914.2005.00283.x

Mayne, T. (1999). Negative Affect and Health: The Importance of Being Earnest. *Cognition & Emotion*, *13*(5), 601-635. doi:10.1080/026999399379203

Mickelson, K. D. (1997). Seeking Social Support: Parents in Electronic Support Groups. In S. Kiesler (Ed.), *Culture of the Internet* (pp. 157-178). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Miller, S. M. (1979). Coping with Impending Stress: Psychophysiological and Cognitive Correlates of Choice. *Psychophysiology*, *16*(6), 572-581. doi:10.1111/j.1469-8986.1979.tb01523.x

Miller, S. M., Diefenbach, M. A., Krantz, D. S., & Baum, A. (1998). The Cognitive-Social Health Information-Processing (C-SHIP) model: A theoretical framework for research in behavioral oncology. In D. S. Krantz & A. Baum (Eds.), *Technology and methods in behavioral medicine.* (pp. 219-244). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

van der Molen, B. (1999). Relating Information Needs to the Cancer Experience: 1. Information as a Key Coping Strategy. *European Journal of Cancer Care*, *8*(4), 238-244. Retrieved from http://view.ncbi.nlm.nih.gov/pubmed/10889622

Mortenson, S. T. (2006). Cultural Differences and Similarities in Seeking Social Support as a Response to Academic Failure: A Comparison of American and Chinese College Students The research reported in this study was funded in part by a General University Research Grant from the. *Communication Education*, *55*(2), 127-146. doi:10.1080/03634520600565811

Nabi, R. L. (1999). A Cognitive-Functional Model for the Effects of Discrete Negative Emotions on Information Processing, Attitude Change, and Recall. *Communication Theory*, *9*(3), 292-320. Retrieved from http://dx.doi.org/10.1111/j.1468-2885.1999.tb00172.x

Nabi, R. L. (2003). Exploring the Framing Effects of Emotion: Do Discrete Emotions Differentially Influence Information Accessibility, Information Seeking, and Policy Preference? *Communication Research*, *30*(2), 224-247. doi:10.1177/0093650202250881

Öhman, A. (2008). Fear and anxiety: Overlaps and dissociations. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of Emotions* (3rd ed., pp. 709-729). New York, NY: Guilford Press.

Ortony, A., Clore, G. L., & Collins, A. (1988). *The cognitive structure of emotions.* New York, NY: Cambridge University Press.

Pauls, C. A., & Stemmler, G. (2003). Repressive and Defensive Coping During Fear and Anger. *Emotion*, *3*(3), 284-302. doi:10.1037/1528-3542.3.3.284

Pew Internet & American Life Project. (2011). Trend data. Retrieved October 26, 2011, from http://pewinternet.org/Static-Pages/Trend-Data/Usage-Over-Time.aspx

Rains, S. A., & Young, V. (2009). A Meta-Analysis of Research on Formal Computer-Mediated Support Groups: Examining Group Characteristics and Health Outcomes. *Human Communication Research*, *35*(3), 309-336. doi:10.1111/j.1468-2958.2009.01353.x

Rees, C. E., & Bath, P. A. (2001). Information-Seeking Behaviors of Women with Breast Cancer. *Oncology Nursing Forum*, *28*(5), 899-907. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11421149

Rees, C. E, & Bath, P. A. (2000). The Psychometric Properties of the Miller Behavioural Style Scale with Adult Daughters of Women with Early Breast Cancer: A Literature Review and Empirical Study. *Journal of Advanced Nursing*, *32*(2), 366-374. doi:10.1046/j.1365-2648.2000.01485.x

Reid, R. C., Harper, J. M., & Anderson, E. H. (2009). Coping Strategies Used by Hypersexual Patients to Defend Against the Painful Effects of Shame. *Clinical Psychology & Psychotherapy*, *16*(2), 125-138. doi:10.1002/cpp.609

Ruiter, R. A. C., Abraham, C., & Kok, G. (2001). Scary Warnings and Rational Precautions: A Review of the Psychology of Fear Appeals. *Psychology & Health*, *16*(6), 613-630. Retrieved from http://www.informaworld.com/10.1080/08870440108405863

Saarni, C. (1997). Coping with Aversive Feelings. *Motivation and Emotion*, *21*(1), 45-63. Springer Netherlands. doi:10.1023/A:1024474314409

Sideridis, G. D. (2006). Coping Is Not an "Either" "Or": The Interaction of Coping Strategies in Regulating Affect, Arousal and Performance. *Stress and Health*, *22*(5), 315-327. doi:10.1002/smi.1114

Silfver, M. (2007). Coping with Guilt and Shame: A Narrative Approach. *Journal of Moral Education*, *36*(2), 169-183. doi:10.1080/03057240701325274

Sime, A. M. (1976). Relationship of Preoperative Fear, Type of Coping, and Information Received About Surgery to Recovery from Surgery. *Journal of Personality and Social Psychology*, *34*(4), 716-724. doi:10.1037/0022-3514.34.4.716

Simpson, J. A., Rholes, W Steven, Oriña, M. M., & Grich, J. (2002). Working Models of Attachment, Support Giving, and Support Seeking in a Stressful Situation. *Personality and Social Psychology Bulletin*, *28*(5), 598-608. Retrieved from http://psp.sagepub.com/content/28/5/598.abstract

Simpson, J. A., Rholes, William S, & Nelligan, J. S. (1992). Support Seeking and Support Giving within Couples in an Anxiety-Provoking Situation: The Role of Attachment Styles. *Journal of Personality and Social Psychology*, *62*(3), 434-446. doi:10.1037/0022-3514.62.3.434

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of Cognitive Appraisal in Emotion. *Journal of Personality and Social Psychology, 48*(4), 813-838. doi:10.1037/0022-3514.48.4.813

Smith, C. A., & Lazarus, R. S. (1990). Emotion and adaptation. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 609-637). New York, NY: Guilford Press.

Smith, C. A., & Lazarus, R. S. (1993). Appraisal Components, Core Relational Themes, and the Emotions. *Cognition & Emotion, 7*(3), 233-269. doi:10.1080/02699939308409189

Spielberger, C. D., Gorsuch, R. L., Lushene, R. E., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the state-trait anxiety inventory*. Palo Alto, CA: Consulting Psychologists Press.

Sylvers, P., Lilienfeld, S. O., & LaPrairie, J. L. (2011). Differences between Trait Fear and Trait Anxiety: Implications for Psychopathology. *Clinical Psychology Review, 31*(1), 122-137. doi:10.1016/j.cpr.2010.08.004

Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). Moral Emotions and Moral Behavior. *Annual Review of Psychology, 58*(1), 345-372. doi:10.1146/annurev.psych.56.091103.070145

Thomas, S., Karunaratne, A., Lennon, R., Lewis, S., Castle, D., Knoesen, N., Honigman, R., et al. (2010). "Just Bloody Fat!": A Qualitative Study of Body Image, Self-Esteem and Coping in Obese Adults. *The International Journal of Mental Health Promotion, 12*(1), 39-49. Retrieved from http://www.ingentaconnect.com/content/cbf/ijmhp/2010/00000012/00000001/art00005

Turner, M. M., Rimal, R. N., Morrison, D., & Kim, H. (2006). The Role of Anxiety in Seeking and Retaining Risk Information: Testing the Risk Perception Attitude Framework in Two Studies. *Human Communication Research, 32*(2), 130-156. Retrieved from http://dx.doi.org/10.1111/j.1468-2958.2006.00006.x

van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Seydel, E. R., & van de Laar, M. A. F. J. (2009). Participation in Online Patient Support Groups Endorses Patients' Empowerment. *Patient Education and Counseling, 74*(1), 61-69. doi:10.1016/j.pec.2008.07.044

Verbeke, W., & Bagozzi, R. P. (2002). A Situational Analysis on How Salespeople Experience and Cope With Shame and Embarrassment. *Psychology and Marketing, 19*(9), 713-741. doi:10.1002/mar.10032

Wang, Y.-C., Kraut, R., & Levine, J. M. (2012). To Stay or Leave? The Relationship of Emotional and Informational Support to Commitment in Online Health Support Groups. *CSCW 2012, February 11–15, 2012, Seattle, Washington.* (pp. 1-10). Seattle, WA: ACM. Retrieved from http://kraut.hciresearch.org/sites/kraut.hciresearch.org/files/articles/yichiaw-support-revision-final-v2.1.pdf

Watson, D., & Clark, L. A. (1994). The PANAS-X: manual for the positive and negative affect schedule - Expanded form. Iowa Research Online. Retrieved from http://www.psychology.uiowa.edu/faculty/Clark/PANAS-X.pdf

Watson, D., & Clark, L. A. (1997). Measurement and Mismeasurement of Mood: Recurrent and Emergent issues. *Journal of Personality Assessment*, *68*(2), 267-296. Retrieved from http://www.informaworld.com/10.1207/s15327752jpa6802_4

Westen, D. (1994). Toward an Integrative Model of Affect Regulation: Applications to Social-Psychological Research. *Journal of Personality*, *62*(4), 641-667. doi:10.1111/j.1467-6494.1994.tb00312.x

Wicks, P., Massagli, M., Frost, J., Brownstein, C., Okun, S., Vaughan, T., Bradley, R., et al. (2010). Sharing Health Data for Better Outcomes on PatientsLikeMe. *Journal of Medical Internet Research*, *12*(2), e19. doi:10.2196/jmir.1549

Williams, P., Nicholas, D., Huntington, P., & McClean, F. (2002). Surfing for Health: User Evaluation of a Health Information Web Site Part 2: Fieldwork. *Health Information and Libraries Journal*, *19*(4), 214-225. Retrieved from http://onlinelibrary.wiley.com.proxy1.cl.msu.edu/doi/10.1046/j.1471-1842.2002.t01-1-03952.x/pdf

Williams, S. L., & Mickelson, K. D. (2008). A Paradox of Support Seeking and Rejection Among the Stigmatized. *Personal Relationships*, *15*(4), 493-509. doi:10.1111/j.1475-6811.2008.00212.x

Yeh, S.-C. J., & Chou, H.-C. (2007). Coping Strategies and Stressors in Patients With Hemodialysis. *Psychosomatic Medicine*, *69*(2), 182-190. doi:10.1097/PSY.0b013e318031cdcc

Yelsma, P., Brown, N. M., & Elison, J. (2002). Shame-Focused Coping Styles And Their Associations With Self-Esteem. *Psychological Reports*, *90*(4), 1179. doi:10.2466/PR0.90.4.1179-1189

Appendix

Appendix A
Survey instrument

Variable	Item	Mean	SD
Health Information Seeking	I would seek information on the medical condition.	6.28	1.12
	I would intend to seek information on the medical condition soon.	6.23	1.12
	I would not plan to look for information on the medical condition.[a]	6.41	1.08
Emotional Support Seeking	I would confide my fear or worries about the medical condition to others.	4.05	1.91
	I would be would be willing to seek understanding or reassurance from others about the medical condition.	4.56	1.88
	I would talk to others about the medical condition because talking about it would help me feel better.	4.14	1.97
	I would accept sympathy and understanding from others who also have it.	4.68	1.73
	I would not go to others for advice how to get better from the medical condition.[a]	4.68	1.99
Fear	I would be frightened because of the medical condition.	4.38	2.10
	I would be timid because of the medical condition.	3.69	1.85
	I would be afraid because of the medical condition.	4.39	2.09
	I would be scared because of the medical condition.	4.41	2.11
Anxiety	I would be calm about the medical condition.[a]	4.33	1.86
	I would be secure about the medical condition.[a]	5.08	1.65
	I would be tense about the medical condition.	5.04	1.77
	I would be regretful about the medical condition.	4.49	1.91
	I would be at ease about the medical condition.[a]	5.18	1.66
	I would be upset about the medical condition.	5.37	1.60
	I would be worrying over possible misfortunes from the medical condition.	4.96	1.83
	I would be rested about the medical condition.[a]	4.98	1.57
	I would be anxious about the medical condition.	5.07	1.72
	I would be comfortable about the medical condition.[a]	5.33	1.50
	I would be self-confident about the medical condition.[a]	4.99	1.68
	I would be nervous about the medical condition.	4.95	1.78
	I would be jittery about the medical condition.	4.41	1.82
	I would be relaxed about the medical condition.[a]	5.19	1.60
Shame	I would feel insecure.	4.34	2.06
	I would not doubt myself.[a]	4.03	1.91
	I would feel embarrassed.	4.15	2.13
	I would feel left out.	3.39	1.85
	People would think poorly of me.	3.36	1.98
	I would feel rejected by others.	3.15	1.89
	I would feel humiliated.	3.59	2.10

ESS Efficacy (Response Efficacy)[b]	Seeking emotional support about the medical condition would be...		
	valuable (1) / worthless (7).[a]	6.4131	1.99
	bad (1) / good (7).	5.3861	1.39
	harmful (1) / beneficial (7).	5.3842	1.43
	unhelpful (1) / helpful (7)	5.1622	1.70
	unproductive (1) / productive (7)	4.8591	1.78
	foolish (1) / wise (7).	5.0907	1.65
	useful (1) / not useful (7).[a]	5.0251	1.78
ESS Efficacy (Self Efficacy)	I would know where to get emotional support for the medical condition.	4.64	1.76
	I would not know how to find emotional support for the medical condition.[a]	4.75	1.91
	When it comes to emotional support for the medical condition, I would know how to separate people that help me from those who don't.	4.96	1.55
	Someone who could give me all the emotional support for the medical condition that I would need would be readily available to me.	4.61	1.78
	When it comes to getting emotional support for the medical condition, I would know where to go.	4.58	1.76

Note. All items measured on a 7-point Likert-type scale from "Strongly disagree" to "Strongly agree," if not indicated otherwise. Survey adaptations and procedure: The words "the medical condition" in the items were replaced with one of these medical conditions: Alzheimer's, arthritis, bone fracture, common warts, dandruff, and genital herpes. Participants were randomly assigned to one of the medical conditions, once they clicked on the survey link. Every question was introduced with "Imagine you have just found out that you have the medical condition." Emotional support was explained to participants as love, care, reassurance, and understanding.
[a] Reversed item. [b] 7-point Likert-type scale from 'Attribute (1)' to 'Attribute (7)'.

Tables

Table 1
Selected Demographic Variables of Participants

Demographic variable	Percentages	
Gender	61.4 female, 38.6 male	
Race / ethnic group[a]	85 % White, 8 % African American, 8 % Latino / Hispanic, 3 % Asian-Indian, 2 % Chinese	
Demographic Variable	**Mean / Median**	**Minimum / Maximum**
Age (years)	36.79 / 35	18 / 82
Annual income (US$)[b]	-- / $30,000-$39,999	Less than $10,000 / More than $90,000
Education[b]	-- / College Graduate	Some high school / Graduated from graduate school

[a] Indicating multiple races/ethnic groups was possible. Latino/Hispanic was not counted as race.
[b] Assessed through ordinal measures, no means available

Table 2
Descriptive Statistics for Negative Emotions Organized by Medical Conditions

Total (*N*=518)	Minimum	Maximum	Mean	SD
Fear	1.00	7.00	4.22	1.85
Anxiety	1.00	7.00	4.95	1.41
Shame	1.00	7.00	3.72	1.70
Alzheimer's (*n*=88)	Minimum	Maximum	Mean	SD
Fear	2.75	7.00	5.86	.87
Anxiety	3.00	7.00	5.92	.87
Shame	1.43	7.00	4.07	1.35
Arthritis (*n*=88)	Minimum	Maximum	Mean	SD
Fear	1.00	6.50	3.95	1.51
Anxiety	1.36	6.93	4.64	1.08
Shame	1.00	5.86	2.56	1.26
Bone fracture (*n*=85)	Minimum	Maximum	Mean	SD
Fear	1.00	7.00	4.02	1.59
Anxiety	1.86	7.00	4.92	1.20
Shame	1.00	6.57	2.57	1.17
Common warts (*n*=90)	Minimum	Maximum	Mean	SD
Fear	1.00	7.00	3.03	1.63
Anxiety	1.00	6.71	4.03	1.38
Shame	1.00	7.00	3.54	1.61
Dandruff (*n*=73)	Minimum	Maximum	Mean	SD
Fear	1.00	6.00	2.49	1.36
Anxiety	1.21	6.79	3.81	1.28
Shame	1.00	6.86	3.81	1.49
Genital Herpes (*n*=94)	Minimum	Maximum	Mean	SD
Fear	2.00	7.00	5.58	1.27
Anxiety	3.29	7.00	6.15	.80
Shame	2.00	7.00	5.62	1.09

Note. All values standardized to 7-point Likert-type scale.

Table 3
χ^2 Model Fit Comparisons of Baseline and Constrained Models

Hypothesis	Emotion for which regression weights were constrained	χ^2 model fit	χ^2 difference to baseline model	χ^2 difference *p*-value (df = 1)
	None (baseline)	1825.276	0	
H3 (Supported)	Fear	1829.468	4.192	.041*
H6 (Rejected)	Anxiety	1825.516	.24	.624
H9 (Supported)	Shame	1875.627	50.351	<.001***

*$p < .05$. ***$p < 0.001$.

Figures

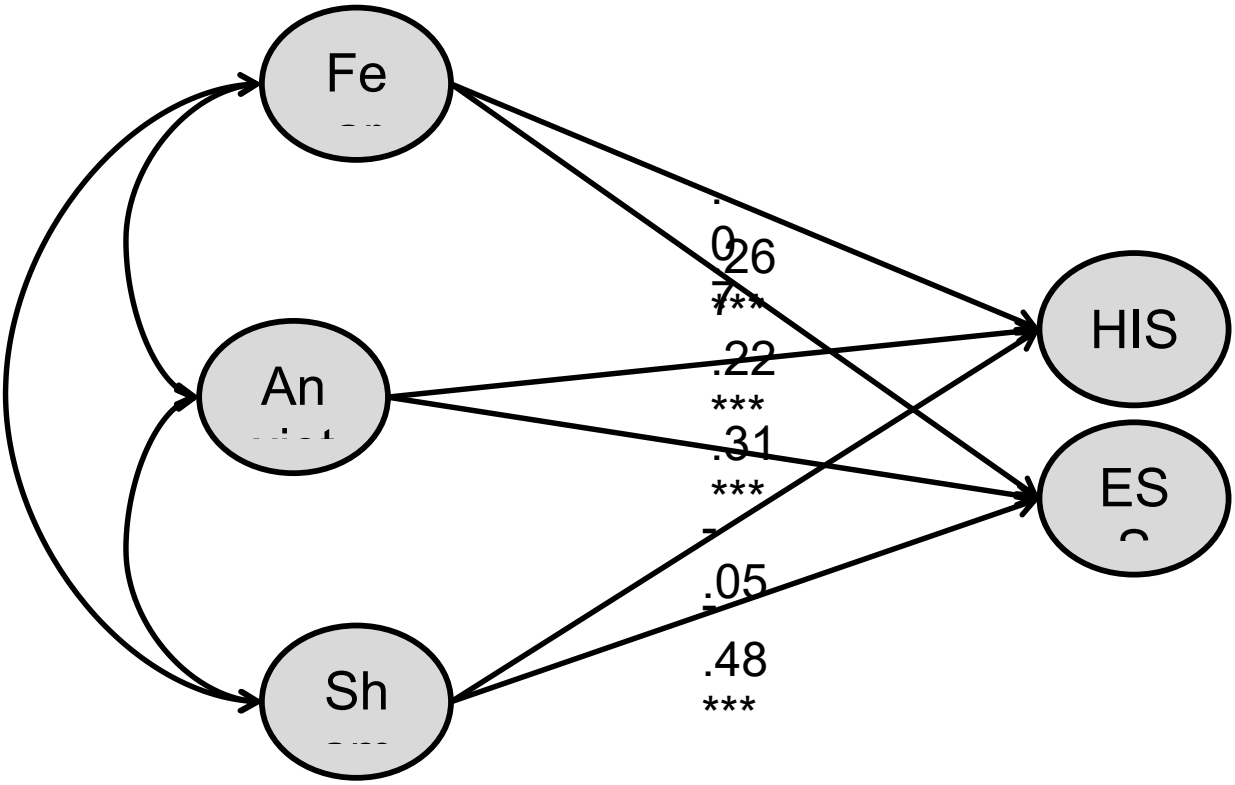

Figure 1. Structural equation model for fear, anxiety, and shame with direct paths to HIS and ESS (regression weights): $N = 518$; RMSEA = .073, CI 90 % [.069, .0.77], p-close = .000; CFI = .923; NFI = .898. ***$p < .001$. ESS=Emotional Support Seeking, HIS=Health Information Seeking.