Electronically Mediated Health-Communication

Uses of Text-Based Media

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Foreword

The candidate is employed by the Norwegian Centre for Telemedicine, University Hospital of North Norway, Tromsø, Norway.

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This dissertation is thematically overlapping the chapter "Connecting with ourselves and others online: Psychological aspects of online health communication" written by the author (Jan Are K. Johnsen) and Deede Gammon, to appear in E. V. Wilson (Ed.), *Patient Centered E-Health*. Hershey, PA: IGI Global Publishing.

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Jan Are Kolset Johnsen

Summary

Objective

This project has focused on why and how people are using the Internet for health-issues. The studies involve collection of descriptive survey data aimed at determining the characteristics of the participants, what characterizes the use of online discussion forums for mental health, and the communication patterns of these forums. Based on these data the objective has been to establish an understanding of the needs this use fulfills for the participants, and the factors responsible for motivating and shaping behavior. Additionally, the impact of health-professionals' involvement in these settings has been investigated, specifically how such involvement could affect the interaction patterns. Using theories from social psychology and social cognition, and evidence from laboratory research on text-based communication, a theoretical perspective is presented concerning people's use of text-based, "poor" media in communicating about their health.

Methods

Several methodological approaches are represented by the studies. The data presented in Paper I was collected by means of a web-based questionnaire that had participants enter the study by self-selection. The study was made possible by the cooperation of Doktor Online (DO; www.doktoronline.no) and Scandinavia Online (www.sol.no). Studies presented in Papers II and III were based on content analyses of log materials from the forums of DO. In Paper II content was condensed into categories to enable comparison of thematically different forums with regards to interaction patterns. Paper III investigated what effects health professionals would have on levels of social presence and interaction structure in an online health-forum. The two studies presented in Paper IV were laboratory experiments that challenge the view that text-based communication, as it is manifested on the Internet, are mainly different from face-to-face communication (speech) in terms of anonymity. This dissertation attempts to describe the relevance of these laboratory experiments in context of the health communication investigated in Papers I – III, and also outside of the online, self-help setting (i.e., traditional health-services).

Results

The results indicated that users of text-based communication for health-purposes were experiencing this as meaningful and rewarding. Participants exhibit high levels of self-disclosure and share information with fellow participants that they would not share with others face-to-face. Furthermore, the communication patterns are believed to be potentially "health-promoting" by exemplifying social support, even in the absence of monitoring by health-professionals. It is argued that professional involvement might help facilitate discussions of special topics, for instance eating disorders. Participants view these forums as a supplement to traditional health-services, and they probably serve different functions. Also, it is argued that the characteristics of the communication medium (text-based) are likely to influence these behaviors and experiences markedly. These characteristics appear to influence people's abilities to conduct strategic and controlled self-presentation, as measured by the accessibility of the "actual self" concept. This could help explain the health-related uses of text-based media and inform the design of future health services.

Conclusions

Text-based health communication appears to fulfill important needs to those participating. These venues allow people to seek out information and find communion with their peers. In the process they disclosure highly personal information and provide and receive social support from others. Although these settings appear to be health promoting and serve a positive function in the lives of those participating, health professionals might have roles as moderators or role models in these settings. Clinical adaptations of these findings will extend these roles further. The experimental studies and the theoretical discussion provided by this thesis are advocating an approach to understanding individuals' use of text-based communication technology for health-purposes along both interpersonal and intrapersonal dimensions based on theories of self-presentation and self-perception.

List of Papers

I. Kummervold, P. E., Gammon, D., Bergvik, S., Johnsen, J. -A. K., Hasvold, T., & Rosenvinge, J. H. (2002). Social support in a wired world: Use of mental health forums in Norway. *Nordic Journal of Psychiatry, 56*, 59-65.

II. Johnsen, J. -A. K., Rosenvinge, J. H., & Gammon, D. (2002). Online group interaction and mental health: An analysis of three online discussion forums. *Scandinavian Journal of Psychology, 43*, 445-449.

III. Johnsen, J. -A. K., Steinsvik, O. O., & Gammon, D. (2003). Health-care professionals' participation in an online discussion forum: The impact on structure, content and interaction. *Journal of Technology in Human Services, 22,* 31-44.

IV. Johnsen, J. -A. K. (2007). Constraints on message size in quasi-synchronous computer mediated communication: Effect on self-concept accessibility. *Computers in Human Behavior, 23,* 2269-2284.

Background

The Internet has become a host to numerous applications and services targeting health-concerns, including information sites, diagnostic tools, counseling and therapeutic services (Barak, 1999). Although the main use of the Internet in terms of health is still information seeking (Andreassen et al., 2007; Hesse et al., 2005), the percentage of users choosing also to communicate about their health appears to be growing (Andreassen et al., 2007). The arguably most common manifestation of online health communication is participation in online support groups, where people gather to discuss common problems and exchange experiences. Today there are thousands of online support groups addressing different health concerns, including mental health issues (Eysenbach, Powell, Englesakis, Rizo, & Stern, 2004; Ferguson, 1996). Online support groups have varying degrees of professional facilitation, structure and ideology. Despite these differences their emergence and character appear to represent the needs and purposes common to the self-help movement, for instance empowerment, peer support, and experiential knowledge (Madara, 1997; Salem, Bogat, & Reid, 1997). They also serve as examples of the combined potentials of self-help and the unique characteristics of online communication, specifically that the Internet affords independence of time and space and the perception of being anonymous (King & Moreggi, 1998; King & Poulos, 1998).

However widespread the use of Internet for health purposes might be, few empirical studies exist that characterize participants in online health communication or analyze their behaviors. The studies presented in this thesis have sought to address these issues. Paper I focused on the attitudes and behaviors expressed by participants of several Norwegian health-related, online discussion forums. The assumption that these groups are based on the philosophies of the self-help movement (Finn, & Lavitt, 1994; King & Moreggi, 1998; Lebow, 1998; Madara, 1997; Salem et al., 1997) was explored, for example how participants viewed the issue of professional involvement. Furthermore, an attempt was made to identify the participants in more detail, and what needs that might be addressed by participation. Also, the role played by visual anonymity[1], a central concept in research on general online behavior, was examined.

Both positive ("health promoting") and destructive outcomes have been identified relative to participation in online health-settings. For instance, health-promotion has been

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[1] The terms "anonymity" and "visual anonymity" might be used somewhat interchangeably in this thesis. Unless further specified this should be interpreted as "visual anonymity" (i.e., lack of visual cues, et cetera).

identified (indirectly) through outcomes such as increased problem-solving skills, overcoming alienation and isolation, reduced stress levels, and the development of social networks (e.g., Dunham et al., 1998; Elstad, 1999; Finn, 1993). More recently, a moderated, e-mail based discussion forum (i.e., with a health professional involved) have shown a reduction in back pain after use, compared to a control group (Lorig et al., 2002). Destructive outcomes have also been found, including social isolation (Kraut et al., 1998), and Internet addiction (Stein, 1997; Young, 1996). Also, the media has reported extensively on cases involving completion of suicidal pacts formed online (e.g., Bugge & Vikøyr, 2000). It is not clear what mechanisms are responsible for determining the outcome of mediated communication. Paper II examined one possible mechanism, that characteristics of the themes discussed might impact the interaction systematically. This idea was based on the finding that forums targeting eating disorders appeared less supportive than forums targeting cancer (Finfgeld, 2000), and that bulimics appeared to communicate differently than individuals suffering from anorexia nervosa (Gleason, 1995). Also, as the level of professional involvement has been noted to play an important role in offline, mutual help groups (Toro et al., 1988) this could be of interest in an online setting. Paper III examined a specific discussion forum during times of high and low professional involvement, where the aim was to describe potential differences in social presence as a consequence of professional interaction. For instance less self-disclosure, an element included in common conceptualizations of social presence (e.g., Rourke, Anderson, Garrison, & Archer, 1999), has been reported in professionally moderated real-life groups compared to groups moderated by "indigenous" leaders (Toro et al., 1988).

Much of the research on online health behavior, including Papers I – III, have highlighted the role of visual anonymity in shaping online behavior. Indeed, most forms of the "unexpected" behavior observed in online settings, such as relationship formation and maintenance (McKenna, Green, & Gleason, 2002; Parks & Floyd, 1996; Parks & Roberts, 1998) and identity exploration and manipulation (Reid, 1998; Talamo & Ligorio, 2001; Turkle, 1995) are probably, in part, motivated by the anonymity offered by the text-based medium (e.g., Joinson, 2001b, 2003). However, an important part of understanding online health communication might be to understand how the inherent difference between the text-medium and speech influences cognition of interlocutors. Also, given that simple differences in the design of text-based user-interfaces might have quite substantial effects on communication patterns (Čech & Condon, 1998, 2004) it was relevant to examine how psychological variables might be affected by differences in a text-interface when anonymity is kept constant. Paper IV examined how different designs of a text-based, user-interface for

CMC impacts participants psychologically following a self-presentation task.

Definitions

The term electronically mediated communication, as used in the title of this thesis, can possibly be used to describe a wide variety of communication technologies, ranging from the telegraph to mobile phones. However, this thesis focuses on Internet-based communication. Joinson (2003) distinguished between eight different domains of Internet activity. In the context of this project three of the domains outlined by Joinson are specifically relevant. This overview helps introduce some key concepts of this thesis:

- E-mail: Asynchronous (not real-time) text-based communication, usually between two participants.

- Chat: Synchronous (real-time) or, increasingly common, quasi-synchronous (real-time, without "transparent" composition of messages) text-based communication, usually involving two people. Examples include Internet Relay Chat (IRC) or specific applications on the WWW. A quasi-synchronous chat application was used in the studies described in Paper IV.

- Asynchronous discussion groups (asynchronous group-ware): Allows for exchanges of messages (text) between many people. Examples include bulletin boards and USENET groups. This domain is specifically addressed by Papers I, II, and III.

Specifically, this project has uniquely looked at text-based, computer-mediated communication (CMC), although some comparisons have been made with regards to face-to-face (FTF) communication (see Paper IV)[2]. In general, the term CMC refers to both task-related communication and interpersonal communication conducted by computer. This includes communication both to and through a personal or a mainframe computer, and is generally understood to include asynchronous communication (via e-mail or through use of an electronic bulletin board), synchronous communication (for instance, chat), and information manipulation, retrieval and storage through computers and electronic databases (Ferris, 1997). Also, this definition might be extended to include similar functionalities offered by mobile phones such as the Short Messaging System (SMS).

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[2] The other domains outlined by Joinson are: File sharing, multi-user dungeons/dimensions (MUDs), virtual worlds (in essence 3D MUDs), video/voice communication, and The World Wide Web (WWW).

Research Questions

When considering the research questions addressed by this thesis it is useful to keep in mind that research on electronically mediated health communication (more widely known as e-health) might still be considered a new discipline, and thus lacking a unique theoretical perspective. Correspondingly, much of the research referred to is conducted outside the realm of healthcare in field such as CMC and "Internet Psychology" (Joinson, McKenna, Postmes, & Reips, 2007). Some key theoretical perspectives will now be outlined, including a description of how the present work attempts to expand on these.

A basic assumption in research on CMC is that communication media influence the communication process and the outcomes of the process. This "effect" is based on the way information can be transmitted in a particular medium. One of the terms most often referred to in this respect is a medium's "richness", defined as the medium's ability to change understanding within a time interval, for instance measured by performance on persuasion tasks (how well are we able to get our view across to another person). This term was introduced through the *Media Richness Theory* (MRT, Daft & Lengel, 1986), which claimed that the richness of a medium could be judged by looking at four criteria: Feedback, multiple cues, language variety, and personal focus. These criteria enable us to rank media in terms of richness. Accordingly, FTF communication can be viewed as the richest medium, followed by telephone, e-mail and letters[3]. A prediction of MRT is that rich media would be best suited to equivocal tasks, while written media (i.e., lower degrees of richness) would be suited for unequivocal tasks. Developed for research on use of communication technology in organizations, MRT was hardly meant to explain the informal social phenomena that have unfolded on the Internet during the past 10 years, but it has nevertheless dominated research on online social interactions.

Indeed, MRT is consistent both with our common sense notions about communication, in particular social communication, and not surprisingly, the preferences of people when asked about communication. The visual cues that may be provided by video communication (e.g., smiles) is important in eliciting affective responses (Winston, Strange, O'Doherty, & Dolan, 2002), and users almost invariably say they would prefer "richer" modes of communication (e.g., video over text; Short, Williams, & Christie, 1976). However,

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[3] Later, the emergence of real-time, interactive video would be viewed as somewhere between face-to-face and telephone with regards to richness (e.g., Isaacs, Whittaker, Frohlich, & O'Conaill, 1994).

sometimes this preference leads people to disregard more relevant or correct information presented in other communication channels (Riegelsberger, Sasse, & McCarthy, 2005), and correspondingly this preference appear unrelated to task performance (e.g., Schliemann, Asting, Følstad, & Heim, 2002). The research literature on CMC is filled with such paradoxes not easily reconcilable with common interpretations of MRT. Asynchronous lightweight text messaging like SMS and IM are excessively popular and clearly foster informal interpersonal communication (Nardi, Whittaker, & Bradner, 2000), while classic theories (e.g., MRT) predict that they should not. Studies show that relationships can develop through media that lack non-verbal cues, just as well as FTF, albeit slower (Lea & Spears, 1995; Walther & Burgoon, 1992). Also, relationship formation varies depending upon system features (for instance, synchronous versus asynchronous communication, Parks & Floyd, 1996; Parks & Roberts, 1998). In sum, it appears that "poor" media are more likely to be used for tasks of a social nature than what would be expected from MRT. The widespread use of the Internet for health-purposes is perhaps one of the most extreme departures from these expectations.

Self-disclosure. A large body of research has focused upon the ability of CMC to facilitate self-disclosure. Self-disclosure might be defined as "what individuals verbally reveal about themselves to others (including thoughts, feelings and experiences) (…)" (Derlega, Metts, Petronio, & Margulis, 1993, p. 1). This process appears crucial to the development of personal relationships (e.g., Derlega et al., 1993; Laurenceau, Barrett, & Pietromonaco, 1998). Evidence from both experimental and anecdotal sources suggests that CMC is characterized by high levels of self-disclosure (Joinson, 1999, 2004). People often reveal more about themselves via a computer than FTF (Joinson, 2001a, 2001b), and many researchers claim that relationship formation can be facilitated, not hindered, by the limitations of online communication (e.g., lack of nonverbal cues; McKenna & Bargh, 1998; McKenna, Green, & Gleason, 2002; Tidwell & Walther, 2002). The concept of hyperpersonal interaction (Walther, 1996) is often used to describe the phenomenon where CMC groups appear more social and emotionally engaging than parallel or comparable FTF groups (e.g., Walther, 1995).

Health-related self-disclosure and social support. The general findings of heightened self-disclosure in CMC compared to FTF settings appear to be relevant also to communication about health-issues. For example, medical patients tend to report more symptoms and undesirable behaviors when interviewed by computer rather that FTF (Greist, Klein, & VanCura, 1973). Clients at a sexual disease clinic report more sexual partners, more previous visits, and more symptoms, to a computer than to a doctor (Robinson & West, 1992).

Ferriter (1993) found that pre-clinical psychiatric interviews conducted using CMC compared to FTF yielded more honest and candid answers. In the UK, the Samaritans (a confidential emotional support service for residents of the UK and Ireland) report that 20 percent of telephone callers report suicidal feelings, while approximately 50 percent of e-mail contacts report this (The Scotsman, 24, Feb., 1999 in Joinson, 1999). Little information exists however about self-disclosure as a variable in an online, self-help setting. Several important questions were raised relevant to the studies of the online discussion forums for mental health (Papers I – III). These include whether self-disclosure was a prominent strategy utilized in this setting (i.e., if the forums where characterized by high levels of self-disclosure), and whether the information shared was unique to the online arena (compared to offline, health-settings).

A number of factors might play a role in facilitating health-related self-disclosure. First of all, a patient communicating through text-based CMC might feel more able to control and set the agenda for the interaction. The model of self-disclosure in healthcare proposed by Kam and Chismar (2003) includes a concept of perceived control as important in order to elicit personal health information from respondents. Concretely, the ability to backtrack in a web-based questionnaire reduced tendencies to respond in socially desirable ways. As a result the information gathered might be more correct or trustworthy than information gathered in less controllable settings (from a patient's perspective). Secondly, self-disclosure might be one a of few communication strategies available in mediated context where personal information is exchanged. The adaptation of uncertainty reduction theory to a CMC setting (Tidwell & Walther, 2002) might provide us with a framework to support this argument. When non-verbal cues are unavailable as a source of social information, participants have to obtain such information by posing direct questions along with disclosing information about themselves (a "direct strategy" for uncertainty reduction). This tendency appears to hold true for many situations in CMC, especially when self-presentation concerns are central.

Also, self-disclosure appears to go hand in hand with people's use of the Internet for providing and receiving *social support*. This phenomenon is well documented, and virtual communities and environments have grown with the singular goal of providing empathy, advice and support to people in need (Joinson, 2003). Preece's study of medical support groups show that the majority of messages could be categorized as either empathic or containing personal narratives. These outnumbered messages framed as practical or factual questions and answers (Preece, 1999). High levels of self-disclosure and provision of empathy also appear characteristic of discussion of mental health issues (Winzelberg, 1997).

Participation in these settings appeared to be catering both to the need for emotional support, but also to a need for answers to factual enquiries. Examining the balance between content in terms of emotional material and factual enquiries was one aspect addressed by studies presented in Papers I and II. How this balance can be affected, by for instance increased professional involvement, was investigated jointly by Papers II and III.

Visual anonymity & CMC. Commonly anonymity, or visual anonymity, is seen as the most important variable in explaining why self-disclosure appears to reliably be high in CMC. Participants that communicate through text-based CMC are oblivious to the aspects of FTF communication involving social norms, social desirability, and interpersonal evaluation (due to visual anonymity). As a result, they feel confident enough to express their "true" qualities or express and explore alternative identities (e.g., Talamo & Ligorio, 2001; Turkle, 1995). This interpretation is supported by studies showing higher accessibility of true self-traits and characteristics in memory after CMC compared to FTF communication (Bargh, McKenna, & Fitzsimons, 2002). Also, Joinson (2001b) used content analyses of transcripts of FTF and synchronous CMC discussions and found that self-disclosure was rated higher for the CMC condition. When adding video to the CMC condition however, self-disclosure ratings dropped to that of FTF. This means that it could be possible to "design" conditions that encourage or discourage self-disclosure by manipulating whether participants are visually anonymous or not. However, basic research on human-computer interaction has shown that the design of user-interfaces is capable of changing patterns of communication. For instance, varying the size of message windows influence how much people write, although the contents would easily fit within either window (Čech & Condon, 1998, 2004). Thus, different requirements with regards to information processing between text and speech could be as important as anonymity in many respects perhaps warranting a reinterpretation of the results presented by Bargh et al. (2002). Differences in self-concept accessibility between FTF and CMC might be due to how the media or user-interface allowed self-relevant information to be processed. This reinterpretation is supported by studies that induced self-awareness in participants by means of writing (Eichstadt & Silva, 2003; Silva, 2002), research on writing therapy (Smyth, 1998; Pennebaker, 1997) and studies of academic writing (Hilgers, Hussey, & Stitt-Bergh, 1999). Each of these research areas point to the effects that the writing/composition process has on cognition. The relation between anonymity and the information processing capacities of the text-based user-interface in relation to a self-presentation task was investigated in Paper IV. It was hypothesized that the information processing differences between a constrained (few characters available for composing a message) and an unconstrained text-interface for chat

would lead to differences in how people performed the task, and consequently the way they thought about themselves. Comparing the two text-interfaces with a FTF condition made this possible. The question addressed by Paper IV further actualizes the process of self-presentation in CMC, as do the focus on self-disclosure in Papers I and II.

Main Objectives

Papers I through III all examined participation in an online, self-help setting. The goals of these studies were to describe the interaction of such groups, and attempted to investigate who used these groups and for what purposes/reasons. The interaction was analyzed based on the finding that CMC might facilitate self-disclosure, and the role of social support was investigated. Also, Paper II examined how different themes (diagnoses) might affect the communication process using content analysis. Paper III extended this work by examining how the communication process was influenced by the participation of health-professionals. The studies might be interpreted as investigating a "social" or interpersonal dimension of online health communication by focusing specifically on the behaviors and attitudes of the participants of these forums. Further, Paper IV attempted to address one of the cognitive/psychological or intrapersonal variables that appeared important in text-based health-communication, the self-concept. It is argued that text-based health-communication and social support, as manifested on the Internet and investigated by Papers I - III, was closely connected to processes of self-presentation (and self-perception) as investigated by Paper IV and by the theoretical discussion provided by this thesis.

To summarize, the overarching objective of this project has been to provide a fuller theoretical understanding of the use of text-based media in health-communication. In order to accomplish this several objectives had to be fulfilled:

- To explore the use of mental health support groups online; this includes providing answers to the questions "who are the participants of these groups", "why are they participating", and "what implications might this use have"? (Paper I)
- To study the interaction patterns of online mental health forums: Are there differences with regards to what themes are discussed, are interactions socially supportive, and what impact and/or role will health-care professionals have in this setting (Papers II and III).

- To identify psychological effects related to communicating under different sets of constraints in text-based communication (Paper IV) in order to understand the role played by modality (text) versus visual anonymity in health communication.

Methodological Considerations

This project has been performed using a multifaceted methodological approach. In a sense the project is placed somewhere halfway on the dimension between the "pure" end-point of naturalistic observation on one hand, and the true experiment on the other (and perhaps also to the dimensions of field research and laboratory research). Papers I - III are in many ways approaching naturalistic observation as the papers were written on a subject matter that were rarely examined in any scholarly fashion. Thus, they lack the clear and well-formulated hypotheses that might accompany theoretical development and refinement within a field of research. In contrast, the studies presented in Paper IV are rooted in the field of experimental (social) psychology. It might be argued that this approach does not represent a strict or "pure" research approach. However, as addressed by for instance Ray (1997, p. 395) "something is gained and something is lost whenever we adopt either of these methods." The choice of methods for this project has reflected both the demand characteristics of the subject matter in question, as well as the need for methodological "triangulation".

The data presented in Papers I – III was collected from Doktor Online (www.doktoronline.no; DO) and Scandinavia Online (www.sol.no; only in Paper I). Data-collection involved both use of a web-based questionnaire (Paper I), and by accessing the web-servers of the sites (with permission) to collect posted messages from log-files. These messages would then be used for purposes of content analysis (Papers II and III). Because both Doktor Online AS and Scandinavia Online AS would benefit from having positive results published, no employees or representatives from these organizations were involved with the design, preparation, data-collection, analyses, or publication of the results presented in Papers I - III. Data presented in Paper IV was collected through an experimental procedure by having participants fill out paper-based questionnaires and perform a communication task and a reaction time task using a computer. A female research assistant recruited the participants at the campus of the University of Tromsø.

Web-Based Questionnaire

Paper I is based around data-collection involving the use of a web-based questionnaire. This questionnaire was made available to all forum participants of two Norwegian health-related websites during a three-week period. Access was provided by a link on the forums' start page. An introductory statement informed users that this was a study of online mental health services in Norway, that relatively little was known about how users experienced such services and that the results could be of importance for designing such services in the future. Also, they were told that the questionnaire would take 15 –20 min to complete, that their anonymity would be ensured and that the results of the study would be made available online. The questionnaire was partly interactive, posing follow-up questions based on responses. Thus, the number of questions posed varied depending upon the answers given. The typical respondent answered between 50 and 60 of a total of 80 items. A number of the items in the questionnaire included open-ended fields inviting free-text responses. Some open-ended items were submitted to a qualitative analysis by the authors in order to identify recurring themes.

Due to the fact that participants used nicknames, and effectively were anonymous, proper sampling became a challenge in relation to this population. Two approaches were considered. First, forum participants could be made to identify themselves, enabling us to make a representative sample of the population. Alternatively, the survey could be posted openly to enable participants to self-select. Due to the fact that the issues discussed; mental health problems/disorders; might raise rather strong pressures with regards to not identifying themselves the latter alternative was chosen. Also, the fact that the study was exploratory with regards to describing the uses of these forums, receiving a maximum amount of responses was regarded as more important than representativity. However, this approach posed serious question about the response rate and interpretability of the results. As described in the Methods section of Paper I, it was possible to make some assumptions about how representative the sample turned out, but it is important to note that the study does not claim to present results that are valid for all health-issues and/or online settings. Rather this approach to the study has provided us with an insight into the behavior of a subpopulation that until this point had been rarely examined.

The self-selection and convenience sampling demonstrated by this procedure also actualize questions of the volunteer status. Specifically, participants had to make a conscious choice when entering the study. Based on the assumption that online health settings might be exhibiting many traits similar to traditional self-help groups, the choice to participate in

research might not be automatic or purely positive. Some participants might have conflicting feelings about contributing, as their involvement in the online community might signal some discontent with the healthcare system of which the researchers were representatives. In general, volunteers differ from nonvolunteers on many variables. For instance, volunteers are more highly educated, have higher occupational status, and higher intelligence than nonvolunteers (Kazdin, 1998). In light of these studies it is interesting to note that volunteers generally exhibit higher degrees of self-disclosure than nonvolunteers (also higher in sociability). Because this was one of the important variables in the present studies, and given the results claiming higher self-disclosure in CMC than FTF, this should be taken into consideration when interpreting the results addressing self-disclosure.

Methods for Assessing Contents of Discussion Forums

Quantitative analyses, for example counting the number of posts, length of topic threads, et cetera, are quite common in investigations of online discourse. Another approach to describing online behavior is to analyze the contents of discussions. Content analysis refers to the systematic and replicable process of condensing or compressing text into content categories based on explicit rules for coding (Krippendorf, 1980; Stemler, 2001; as cited by Marra, 2006). As noted by Mason (1992) however the transcripts (or log-files) of conferencing or forum activity, perhaps the most obvious source of data in these contexts, are rarely used. Papers II and III both utilize different variants of content analyses, where the main objective is to describe interaction respective to a predetermined set of categories.

The analysis presented in Paper II was based on all posting activity that took place during four weeks of November 1999 within each of the three mental health discussion forums on Doktor Online. The users were ensured anonymity and were informed that their contributions to the forum would be archived and possibly subjected to analysis later on. The regional ethical committee approved this procedure. The archived posts were kept as hypertext files (html format) on a local hard drive and loaded into a spreadsheet for easy access during the analysis.

The categories used in the analysis of forum activity in Paper II were a priori categories ranging from "Constructive/Positive", via "Neutral" and "Negative", to "Destructive". These categories were created to describe the experiences of the participants, but also to enable some speculation about the outcomes of forum participation. Some issues need to be addressed in relation to these categories.

First and foremost, the categories are relatively broad and general. Effectively the analysis forced us to attribute one single category to a specific message, irrespective of the length and complexity of the message. From a methodological point of view the categories therefore best fit a description of a syntactical unit, rather than thematic unit (for discussions of units of analysis see for instance, Howell-Richardson & Mellar, 1996; Rourke, Anderson, Garrison, & Archer, 2001). Also, the analysis involved assigning these categories to a single main-post but to everything from one to several posts that made up the topic thread (see Paper II for definition of main-post and topic thread). This implied, as evidenced by the interrater reliability scores reported in Paper II, that there were far more variability in the analysis of the topic threads than for main-posts. An analysis that took into account the variability of the topic threads would have better described the dynamics of the forum, for instance a combination of a sequential, visual mapping analysis and a content analysis approach could have yielded more detailed results (as discussed below in relation to social support).

One of the objectives of the analysis in Paper II was to examine the role played by social support in these forums. However, there are coding procedures that would have targeted this dimension more directly. For instance, the Interactive Coping Behavior Coding System (ICBCS; Barbee, 1990) suggests four categories of behaviors specifically related to social support, called solve behaviors, solace behaviors, dismiss behaviors, and escape behaviors. These categories have received considerable support through empirical studies (see Barbee & Cunningham (1995) for a review). Some dimensions of the ICBCS might however be present in the categories of Paper II. For instance, the "Constructive/Positive" category both addresses the "problem-focused/approach" and "emotion-focused/approach" dimensions that are characteristic of solve and solace behaviors in the ICBCS. Similarly, the "Destructive" category is probably addressing many of the aspects of the "emotion-focused/avoidance" dimension of the escape behaviors. The "problem-focused/avoidance" dimension found in the dismiss behaviors are probably not well represented by our categories, but might be present in both the "Negative" and "Destructive" categories. The choice of the categories currently used reflected more the wish to address potential outcomes than to detailed analyze content in relation to social support. In a sense this approach is similar to Henri's model for evaluating CMC in learning processes (Henri, 1992), where the object was not only identifying specific skills or types of interaction from message content, but also to define how these could lead to cognitive development and meaningful learning (i.e., include some idea about potential outcomes). Ideas about outcomes are not straightforward however. For instance, the term "destructive", although being used rather frequently by other CMC

researchers (e.g., Finn & Lavitt, 1994; Waldron, Lavitt & Kelley, 2000), might be somewhat misleading when thinking about possible outcomes of health-related CMC. For instance, expressions of a destructive nature could very well lead to other participants responding in very constructive ways, although our analysis does not support this notion. Nevertheless, caution should be exercised when discussing destructiveness in CMC, as little is known about the therapeutic processes that might be involved in experiencing genuine expressions of emotional content in online group setting; albeit not necessarily positive emotions.

"Social presence" was deemed to be the best candidate in order to measure an effect on the pattern of interaction as a result of professional involvement in Paper III. The social presence concept (Short, Williams, & Christie, 1976) is very often referred to in terms of how communication technology is able to support social communication of varying degrees of complexity, for instance through MRT, and has also been applied to educational uses of communication technologies (e.g., Rourke et al., 1999). The study presented in Paper III might be the only explicit attempt to measure effects related to social presence in an online, health-related setting. The analysis included collection of messages from two separate time-periods with different levels of professional involvement (high and low). Messages were stored on a local computer and submitted to analysis using the 11-item protocol of Rourke et al. (1999). Adequate scores for interrater reliability were obtained for both time-periods.

In addition, Paper III describes the use of a visual mapping technique, also utilized in educational settings (Hara, Bonk, & Angeli, 2000; Howell-Richardson & Mellar, 1996), to investigate and illustrate health-related interaction. This use was motivated by the same considerations noted by Jeong (2003) in relation to a sequential analysis approach (the Discussion Analysis Tool (DAT)). This approach posits that a central part of information about online discourse is found in relationships and transitions between messages/posts. Specifically the DAT combines sequential mapping with coding of discrete events, constituting a combination of content analysis and "visual techniques" such as visual mapping. Combinations of the coding categories of Paper II and the visual mapping technique of Paper III could provide interesting results in relation to for instance social support. Such an approach would allow investigations of concrete patterns within a forum, for instance which categories of main posts receive which categories of answers. This could give more reliable and detailed answers to the question of the role of social support.

There are other potential uses of the data in Paper III where more quantitative analyses could have been used in order to describe forum activity. For instance, Marra (2006) suggested calculating the concept of "level of participation" (Mason, 1992) using a combined

score consisting of number of postings, depth of postings (number of messages in a topic thread) and reading patterns. This score would probably have illustrated much of the same that the visual mapping technique attempted to accomplish (e.g., how interactive and immersive the forums were), but would have given a better foundation for statistically comparing the two conditions.

Using the data from log-files also raise ethical questions. Although participants were involved in activities that are in some sense "public", due to the fact that their messages were freely available online, the messages might not have been submitted had the participants known that they would be subject to analyses. Also, the prospect of scientific analysis is very different from the knowledge that ordinary people might read one's messages. Consequently, there is a definitive possibility that participants were less honest and self-disclosing in the period when data was collected from the forums because they knew their responses could be analyzed.

Experimental Design

The two laboratory experiments involved recruitment of a total of 122 participants (Experiment 1: 56 participants; Experiment 2: 66 participants) at the campus of the University of Tromsø in what they were told were studies of communication. Both experiments offered participants incentives for participation (lottery with gift-certificates as prices). The general procedure was as follows for both experiments. Participants were entered into the experiment in pairs, but were kept separate until the communication task. First participants' indicated their actual and true self-concepts using a questionnaire. The actual self might be briefly defined as the personal traits or characteristics of a person, while the true self might be defined as the personal traits or characteristics that a person wished others knew about, but is most often incapable of expressing.[4] Then participants were then brought together to communicate using either a computer or FTF. Based on the research question two CMC conditions were constructed. One condition was unconstrained, that is placed no limit on message length, whereas the other condition was constrained, placing rather severe limits on message length (i.e., the number of characters available to compose a message). The communication task was completely non-instructed in order to facilitate self-presentation. After completion of the communication task (time limited), participants would individually complete a reaction time task where the objective was to respond as quickly as possible to

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[4] See the Methods sections of Paper IV for more detailed definitions of the self-concepts as well as other procedural and conceptual differences between Experiment 1 and 2.

words displayed on a computer screen. The task was to determine whether the words described them or not using keys marked "Yes" and "No". Among these words were the words used by participants to indicate their actual or true self-concepts, along with a set of filler words (personality adjectives). Mean reaction times to each of these set of stimuli (actual self and true self) could then be calculated to indicate which self-concepts was most easily accessible in working memory.

The design employed by the studies described in Paper IV was quite demanding in terms of how the experiments had to be performed. A key premise of the design was that the participants should not meet before the self-presentation task. This required that participants were recruited separately, and that they would have to be kept separate up until the communication task (either FTF or by computer). The stringency of the procedure were quite limiting with regards to how many participants could be recruited within a reasonable time frame. The estimation of sample size done in preparation to the studies were based on the work attempted replicated (Bargh et al., 2002), but introduction of the third between subjects variable might have been more demanding than foreseen with regards to the number of participants required.

The attempts to ensure a sufficient level of control to the experiment might have introduced confounding variables into the design, for instance stress or discomfort by having to change rooms during the procedure, et cetera. Also, the self-concepts and their operationalization might have added noise to the procedure. Because the self-concepts are highly individual in content the analysis was not based on a unified set of stimuli. Rather, the various words chosen by each person was pooled together and used as a basis for calculating reaction times. There are many sources to "experimental noise" in this case, for instance the words chosen in either category might be of different lengths or complexity, making them harder to identify (effectively increasing reaction time). This should then produce results similar to what have been identified here, for example if more complex words were chosen to describe the "true self" than the "actual self". This would certainly make sense from a common-sense perspective where our true qualities per definition would be more complex and "deep" than our day-to-day qualities or characteristics. Also, such an effect could be created if words were chosen from different domains, for instance personality (true self) versus practical abilities (actual self). An attempt to control for this was introduced in Experiment 2 (Paper IV) by limiting the choice of words available to describe one's self-concept to personality traits (forced choice), although effects with regards to complexity could still be relevant.

Last, the lack of logging or recording of the interaction in the FTF condition, in either experiment, has limited the ability to investigate the interaction in more depth. For instance, the log-files collected from both chat-conditions contained rather concrete examples of self-presentation. There is a possibility however that the presence of non-verbal cues in the FTF condition made this process superfluous or less relevant. As a consequence the measurement of reaction time for this condition might not have been directly comparable to those of the other conditions.

Summary of Papers

PAPER I: Social support in a wired world: Use of online mental health forums in Norway

This study explored the use of the four major Norwegian mental-health-related online forums. Questions addressed by the study were who participate, why, and what implications use may have. A further objective was to provide a basis for proposing relevant research questions and issues for public policy attention. A total of 492 responses to a web-based questionnaire were received. The respondents were predominantly women (78 percent) in the age range 18–35 years. Participants were asked to provide examples of usefulness by means of an open-ended question. An analysis of the responses reveals that participation appears useful for acquiring information. Information in this context included both practical/factual information and experiential knowledge from peers, for instance how to cope with a disorder or stressful situations. Evidence of heightened self-disclosure was found in that a majority (75 percent) found it easier to discuss personal problems online than FTF, and almost half said they discussed issues online that they did not discuss FTF. A majority would not have participated had they not had the option of using a pseudonym. Participants thus preferred being anonymous or at least being able to conceal their identity somewhat. Further, the respondents perceived discussion groups as a supplement rather than a replacement of traditional mental health services, reporting no change in the amount or type of service used. A clear majority wanted professionals to take active roles in these types of forums. Comments from respondents indicated that forums might have an empowering effect. The results suggest that online interaction can have unique for people suffering from mental disorders. Professionals will need new knowledge of their roles, and public authorities will have to decide their role in influencing the quality of services offered, and the social values conveyed, to those who seek help the Internet.

PAPER II: Online group interaction and mental health: An analysis of three online discussion forums

The study examined interactions on three Norwegian online discussion forums, and attempted to identify differences in interactions and plausible outcomes of thematically dissimilar forums. The research question was in part informed by the experience of moderators that periodically had to close the forum for eating disorders due to activity best described as "destructive". Four categories were applied to the forums in order to distinguish potentially constructive and destructive uses. The categories were "constructive/positive", "neutral", "negative" and "destructive". The coding categories received satisfactory interrater-reliability. The results show that interaction along the constructive–destructive dimension appeared contingent upon the themes discussed, as well as the level and nature of professional involvement. In general, the interaction patterns appear to be highly supportive, with "constructive/positive" responses to a participant's initial message. Interaction adhering to a destructive dimension was identified only in relation to the forum for eating disorders, where this dimension was more than twice as common compared to the other forums. Reasons for this destructiveness is perhaps found in the specific aspects of eating disorders, both in terms of age (large proportion of participants below eighteen) and symptomatology (self-inflicted behaviors as a means to gain personal control). Discovering to what extent theme and professional involvement influence interactions in discussion forums might guide further professional involvement in online group settings and the design of appropriate online environments.

PAPER III: Health-care professionals' participation in an online discussion forum: The impact on structure, content and interaction

The study investigated the impact by health-care professionals on a Norwegian Internet discussion forum for eating disorders. To identify the impact a comparison of the same forum in time-periods with either high or low level of professional involvement was performed. The hypothesis was that professional involvement would have marked effects on the interaction in discussion forums; among other things encourage short and factual/practical interaction patterns at the expense of social climate, as measured by social presence. A number of different methods were utilized, including quantitative analysis, (qualitative) content analysis, and visual mapping. The results showed differences between high and low

professional involvement in the forum in terms of activity level, distribution over weekdays, social presence density, and structure. Forum activity was higher in periods of low professional involvement compared to periods of high professional involvement, as measured by the total number of messages posted. Also, the number of participants appeared higher in periods of low professional involvement. Social presence density scores were higher for the period of high professional involvement, a finding apparently contingent upon more frequent use of phatics and salutations (i.e., use of greetings and nicknames, such as "Dear NN"). It is possible that health professionals served as role models for this kind of interaction. High levels of self-disclosure and emotional content characterized both periods. Structurally, as investigated by the visual mapping technique, the period with low professional involvement appeared to be associated with higher degrees of clustering of responses, a finding that might indicate higher interactivity. In comparison, the period of high professional involvement appeared more starter-centered, perhaps due to more direct questions being asked aimed at the professionals.

PAPER IV: Constraints on message size in quasi-synchronous computer mediated communication: Effect on self-concept accessibility

The study investigated the interplay between an experience of anonymity and the design of the user-interface in text-based CMC. Anonymity is often regarded as a variable of great importance in research on computer-mediated communication, for instance in eliciting self-disclosure. However, this view might neglect or diminish the role played by the design of the user-interface. A study was designed that attempted to show which effects a manipulation of the user-interface would have, both on communication patterns and psychological variables. Quantitative aspects of communication was measured, for instance message length and frequency. Also, self-concept accessibility was measured in a replication of parts of the research presented by Bargh et al. (2002). The manipulation of the user-interface consisted of varying the number of characters available to interlocutors. Thus, two conditions were designed: One constrained condition with few characters available for message composition and one unconstrained condition without restrictions on the composition process. It was predicted that different designs will not only influence communication quantitatively, but also to what degree participants are able to introspect and strategically plan communication in a

self-presentation task. The unconstrained design that allowed elaborate composition of a message during communication was expected to lead to more strategic or normative self-presentation, thus increasing availability of the ''actual self''. Two experiments were conducted, where the severity of the constraint and duration of communication were different. The results indicated that constraints on communication lead to predictable quantitative effects, among them higher turn taking. Also, accessibility of the actual self appeared to be associated with the unconstrained condition and user-interface. It was hypothesized that this effect appears because the unconstrained interface gives the participants more time to compose and plan communication. The results were discussed with regards to the Social Identity Model of Deindividuation Effects, as well as the differences between writing and speech.

Discussion

The project set out to answer a set of main objectives. First, the characteristics of participants were examined. As Paper I showed the respondents were from a highly specific group, being predominantly female and between 18 and 34 years of age. As such the results reflect both the fact than women are likely to seek help for mild psychiatric problems than men (e.g., Biddle, Gunnell, Sharp, & Donovan, 2004; Möller-Leimküller, 2002) and the tendency of younger individuals pioneer use of new technology (see Livingstone (2003) for a review). Interestingly, the high percentage of women compared to men does not support the notion that men might seek help more readily in context that limits the risk to male self-esteem or constructions of masculinity, for instance Internet-based contexts (Addis & Mahalik, 2003). Investigations of more general health-related use of the Internet however show less skewed gender distributions (e.g., Andreassen et al., 2007) indicating that the specific themes of the current studies might bias the distribution markedly. The perhaps most interesting finding reported in Paper I is the interesting "conflict" between the fact that over half of the participants who had been in contact with health services saw the Internet as a supplement to this contact, whereas almost half of active participants reported sharing previously untold information online. Despite not knowing exactly how these percentages overlap it might be considered a paradox that this information is apparently important and sensitive, but might still be neglected in traditional health settings that the online interaction is perceived as a supplement to. These results might be addressing the problems identified in accommodating the "patient's agenda" in health consultations (Levenstein, McCracken, McWhinney, Stewart, & Brown, 1986), for instance that the emotional and social issues relating to a patient's problems might be neglected (e.g., Campion, Butler, & Cox, 1992). The potential that text-based communication could have for alleviating this problem will be explored further by this discussion, and should receive attention in future research on new health-services.

Further, the combined results presented in Papers I and II demonstrated that social support appear to be the backbone of the interaction of these forums. As indicated by the question surrounding usefulness (Paper I) this might be a main reason for participation. Self-disclosure is very much part and parcel of this process, both as demanded by the themes discussed (mental health) and arguably related to media characteristics. Participants were engaged in interactions closely conforming to the notion of social support, as they respond to

the resignation and sadness expressed by some participants, with constructive and positive messages. These findings are closely related to results of similar studies (e.g., Preece (1999) and Winzelberg (1997) discussed elsewhere). The present studies have extended these findings by showing that thematic differences did not radically change these patterns, but that meaningful differences could be found both based on themes and on the involvement of health professionals.

Paper III addressed the impact of health-professionals' involvement in such settings, showing that the social climate, and perhaps "genuine nature", of these forums are not changed markedly in response to professionals being involved. As close ties were expected, at least conceptually, between online health communities and self-help philosophies (e.g., Madara, 1997; Salem, Bogat, & Reid, 1997) this finding was somewhat unexpected, along with the positive attitudes to professionals expressed in a former study (Paper I). Also, this finding is somewhat contrary to that of Toro et al. (1988) who have shown lower self-disclosure related to professional leadership of real-life forum. Still similar results to Toro et al. is also found with regards to pattern of communication, where it appears that professionals might be behaving consistent with expectations to a professionals, for instance answering questions. This might lead forums with high levels of professional involvement or moderation to be experienced as more formal than forums with no or low professional involvement. Furthermore this illustrates the potential that lies in professionals as role models or modelers of behavior. Professionals could for instance lead discussions in more health-promoting or constructive directions. On the other hand, professionals could have detrimental (or unknown) effects if they consistently and incorrectly discourage behaviors that are not seen as "relevant". This knowledge might be important in efforts to utilize the potential of online health communication in official settings. Future research into the impact that health professionals might have however remains important, specifically for cases that might demand specific awareness (e.g., eating disorders or issues with similar types of symptoms).

Last, Paper IV has shown that aspects of the user-interface of computer-based communication application did appear to influence the process of self-presentation in line with the research hypothesis. An interface that enables the user to manipulate information more readily leads to a more accessible normative (actual) self-concept after communication. This might call for a reinterpretation of the earlier findings of Bargh et al. (2002), and perhaps other research of medium effects solely drawing on theories of anonymity and "lack of cues". This finding has been interpreted as evidence of strategic self-presentation and it is argued that this mechanism might be relevant in order to understand the widespread use of text-based

CMC for health purposes, and important with regards to informing the design of health services.

The Role of Social Support

Given the fact that social support processes appeared to be reliably identified by two of the studies presented here this can serve as a foundation for thinking about online health communication in general, and self-help/mutual support groups specifically. Online social support appears to include both dimensions of social support outlined by Cohen, Gottlieb, and Underwood (2000). First, participants might contribute in these online settings from a perception that others are in need of support. Social support in this sense implies the experience of the participants that there are social resources available to them in order to assist coping with a problem. Secondly, social support might denote the potential health benefits derived from participation in these settings. This perspective is clearly defined by Cohen et al. (2000, p. 4), that state: "The hypothesis here is that others can influence cognitions, emotions, behaviors, and biological responses in manners beneficial to health and well-being through interactions that are not explicitly intended to exchange help and support. Examples of pathways through which these benefits might occur are the effects of human relationships on the diversity of our self-concepts, feelings of self-worth and personal control, and conformity to behavioral norms that have implications for our health".

The present work has addressed both these perspectives. Papers I – III underlined the importance of social support as a motivational principle guiding initial use and shaping interaction. However, the importance of the second perspective in terms of understanding online health behavior might be underlined. An important aspect of the specifications of Cohen et al. (2000) is that much of the user-initiated (self-help) health-communication that takes place online today might "work" (i.e., have implications for people's health) even though this is not the expressed intention of the communication partners. This might be the case for many real-life online groups, and perhaps extend to include how themes are discussed. For instance, in Paper II what is termed "destructive" messages (posts) might have positive effects by the triggered processes, despite the destructive face value of these messages. Also, the cognitive effects that might follow the information processing of text-based communication might be influential in creating positive health benefits. The findings of Paper IV thus reflect some of the cognitive processes that might be instrumental in online health settings. Indeed, the two dimensions suggested by Cohen et al. (2000) might be said to

highlight two different domains of the social support process, the *interpersonal* versus the *intrapersonal*. Participation in the settings described by this thesis clearly involves both domains, and possible effects should be evaluated from a dual perspective. The focus will now turn to the processes of self-presentation and self-perception as representations of these domains, and how these processes might further extended the findings of this project.

The Interpersonal Dimension of Online Health Communication

   Self-presentation. The process by which we manipulate, monitor and control the information conveyed to others about us are referred to as *self-presentation*[5]. An important premise of self-presentation theory is that people are motivated to present themselves in a desirable way to others, and to maintain a desirable impression (Baumeister, Hutton, & Tice, 1989; Fiske & Taylor, 1991; Schlenker, 2003).

   However, this motivation regrettably often interacts negatively with health, as behaviors that are deemed self-promoting, or at least are viewed as such by the individual, are often detrimental to health (Leary, Tchividjian, & Kraxberger, 1994; Martin Ginis & Leary, 2004). Behaviors that fall into this category include failure to use condoms, excessive sunbathing, excessive or yo-yo dieting, consumption of harmful substances (including alcohol and tobacco), use of steroids, failure to exercise, acne cosmetica, and cosmetic surgery (Leary, Tchividjian, & Kraxberger, 1994). All these behaviors are self-enhancing, either through the image they project (for instance, excessive alcohol consumption is deemed "cool" by many adolescents) or by their effects (for instance, increased muscle mass from use of steroids, or weight-loss through dieting). However, the positive, self-enhancement effects are in most cases overshadowed by the potential threats these behaviors pose to the person's health.

   In the context of this project it might also be interesting to understand how self-enhancement motives might influence people's actual interaction with health-services. It appears that failure to seek help for various health-problems can be explained, at least in part, by self-presentation concerns (Martin, Leary, & Rejeski, 2000). Here, the embarrassment associated with examinations or procedures involving intimate body parts (i.e., genitals, breasts, et cetera) might lead people to avoid or delay these procedures. Also, threats to our self-image might influence help seeking for a number of other illnesses or conditions, when

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[5] Often *impression management* is used interchangeably with self-presentation, although this normally refers to activities where the impressions that are controlled are those of other people or entities (Schlenker, 2003).

these are seen as stigmatizing or socially unacceptable. Many mental disorders fall under this category, as do sexually transmitted diseases, and to some extent illnesses attributed to lifestyle (obesity, diabetes, etc.). Identifying the nature of the themes discussed in the online forums might be helpful in understanding how self-presentation concerns might affect health communication. Paper I addressed this issue by asking participants to characterize the content they discuss, and how easy or difficult they felt discussing it was. Based on the findings connecting self-presentation and health, it was expected to find high levels of the content being characterized as belonging to categories such as "stigmatized" and "embarrassing", or invoke similar concepts. This was confirmed by the answers to the open-ended questions concerning the themes and issues discussed by the participants in the mental health forums (Paper I, see also "The Intrapersonal Dimension of Online Health Communication: Writing and Health"). Also, these subjects were experienced as easier to discuss online than offline (FTF), in line with the previously discussed literature on self-disclosure and CMC. Interestingly, the literature on self-presentation and CMC introduces a concept that might be highly useful for understanding this behavior, strategic (or selective) self-presentation.

Strategic self-presentation. Early writings about the social aspects of CMC noted the possibilities that mediated contexts offer for identity and self-exploration (Rheingold, 1993; Turkle, 1995). Central to these notions were manipulation of self-presentation, for instance by presenting oneself as the opposite gender. Also, mere physical appearance (e.g., gender, ethnicity, (un)attractiveness) communicates a lot about ourselves to others, whether we like it or not. Appearances, also called "gating features" (McKenna, Green, & Gleason, 2002) trigger expectations, sometimes in form of stereotypes. These features, which might be inoperative online (due to visual anonymity), can undermine relationship formation based on more substantive features of the encounter. Increased control over how we present of ourselves to others in CMC, has been addressed by several authors (e.g., McKenna & Bargh, 1999; O'Sullivan, 2000) and might be central to an understanding of health related CMC.

O'Sullivan's studies (2000) suggest that mediated channels are unique in their ability to allow management of self-relevant information, and that people's awareness of this fact influence preferences and choices of communication channels in social situations. Mediated channels appear to be preferred in "confess" situations. These are described as situations where the information shared is self-oriented and the valence is negative. Returning to the notion of help seeking for health-problems, these properties (self-orientation and negative perceived outcomes) might be typical for many types of health scenarios. Moral objections or social stigmatization are still attached to many illnesses. Examples include the teenager

seeking information about sexually transmitted diseases. This person might feel threatened not only by the health-problem and possible outcomes, but also, and perhaps more so, by issues of morality. Similarly, the patient seeking information on how to cope with obsessive thoughts might feel stigmatized and prone to be misunderstood. For them, relating to the findings of O'Sullivan, choosing a text-based communication medium would address these threats effectively. Evidence suggests that the sharing of health-issues corresponding to the notion of the confess scenario is quite common in an online self-help context. Davison, Pennebaker, and Dickerson (2000), for instance, characterize online support as "(…) oriented around conditions poorly understood and somewhat overlooked by the medical community" (p. 214).

Also, the present results and the theoretical notions presented here in many ways conform to the hyperpersonal framework (Walther, 1996). This framework has received support for other examples of mediated communication, for instance online dating (Gibbs, Ellison, & Heino, 2006) and online education (Chester & Gwynne, 1998). The term "hyperpersonal" is meant to signify the more rapid development, and sometimes exaggerations, of relationships online (compared to FTF situations). This framework states that several factors contribute to hyperpersonal interaction taking place online. First, participants in online communities often share social category, and is therefore perceived as more similar to each other, contributing to an increased liking among communication partners. These categorizations are very obvious in the online settings investigated in Papers I – III, where the titles of the forums more or less defines who the participants are, or who they might be expected to be. Also, the homogenous age and gender distribution of the participants included in these studies should attribute further to this process. Secondly, message construction can be optimized without having to worry about non-verbal behavior and visual cues, ensuring more positive self-presentation. Participants have more time to write their messages and can devote more attention to message content than in communication situations requiring immediate answers. Paper IV directly addressed the capabilities of the medium with regards to information processing and how this might affect self-presentation. These results support the notion that selective or strategic self-presentation is more likely to take place when the medium supports careful message construction, compared to more restrictive media.

Thus, it would appear that certain modalities of ICT make it possible for people to manage presentations of themselves more controlled, selectively, or strategically than would be the case FTF (see also, Walther (2007)). Media that allow controlled information processing enable users to think about themselves and how they want to be perceived, while

the interaction unfolds. The constraints imposed on the user-interface in the studies presented in Paper IV were a direct test of this idea. A user-interface that enabled controlled processing of information should be related to or exhibit signs of strategic self-presentation when compared to a user-interface that restricted or limited controlled processing, even though anonymity was held constant. This should be measurable by the accessibility of self-concepts related to this process, for instance the "actual" and "true" self-concepts as utilized by Bargh et al. (2002) and in the studies presented in Paper IV. Based on the definitions of these concepts it was deemed that evidence of strategic self-presentation would be accompanied by higher accessibility of the actual self-concept compared to the true self-concept. The results presented in Paper IV supported this hypothesis, that the actual self-concept was more accessible than the true self-concept after communication in an unconstrained text-based user-interface. It is argued that the popularity of text-based media for health communication could be related to the possibilities afforded by the text-medium to manipulate self-relevant information.

The Intrapersonal Dimension of Online Health Communication

Writing and health. Central to the idea of hyperpersonal communication/interaction (Walther, 1996) is the notion that certain technical capabilities of the media facilitate this. Explicitly, the asynchronous nature of CMC might play a specific role in shaping behavior in this direction. The process of composition, and the cognitive effects of this process, appears important in mediating this behavior.

In the case of health a similar focus on the composition process is found in a line of research addressing what is known as the "writing cure" (Pennebaker, 1997; Pennebaker & Beall, 1986; Pennebaker & Francis, 1996). Pennebaker and colleagues found that the act of writing about emotional experiences has positive effects for those with and without health complaints. "Emotional writing" typically consists of structured writing tasks, where participants are asked to write about emotional upheavals or traumatic experiences. Studies that use an emotional writing, or emotional expression, task report somewhat different approaches with regards to length, number, and duration of the writing sessions. Sessions are shown to vary from a single 20-minute session to one 20-minute session per week for 4 weeks (Smyth, 1998). Outcomes of these sessions are compared to that of a control group (non-writing). Emotional writing has shown to positively influence frequency of physician visits, immune function, stress hormones, blood pressure, and a host of social, academic, and cognitive variables (Campbell & Pennebaker, 2003). These findings appear to be reliable

(e.g., Smyth, 1998), although alternate interpretations have been voiced (Littrell, 1998). Participation in an online health setting such as those investigated here would clearly be related to these findings, and ideas about possible health-effects could perhaps be informed through the research performed on emotional writing. The activity investigated in Papers I - III in many ways adheres to the emotional writing paradigm. For instance, participants in the mental health discussion forums use words such as "embarrassing", "shame", and "guilt" to describe the themes and issues discussed, signaling that these are emotionally involving. Also, the value of discussing previously unshared themes is stressed when asked about the usefulness of the forums. Expression of emotion is also a prominent indicator of the coding scheme of the content analysis described by Paper II. For instance, instances of negative or destructive main-post or topic threads are chiefly defined by description of emotional challenges and problems (for instance, resignation or idealization of problems). With over half the respondents of Paper I actually participating by writing messages, online forums might be considered a real-life "laboratory" for investigating the effects of emotional writing. Interestingly, Wright (2002) has attempted to link the literature related to writing therapy specifically to online counseling. Also, the Internet-based "Interapy" application developed by the Amsterdam Writing Group include structured writing tasks that show promising results in controlled trials (Lange, van de Ven, Schrieken, & Emmelkamp, 2001).

Writing about emotions might affect people on multiple levels, and it can be argued that no single theory or perspective will convincingly explain the related health effects (Pennebaker, 2004; Smyth, 1998). Consequently, a number of different explanations have been presented, including Freudian notions of catharsis, behavioral concepts of habituation and extinction, cognitive oriented ideas related to perception, memory, self-regulation, and constructivist notions of meaning. Whereas elements of all these ideas may be relevant, evidence suggests that the introduction of structured tasks to assist self-regulation is important for these effects to be reliable (Cameron & Nicholls, 1998). These include focused emotional disclosure (about a specific problem), as well as formulating intentions or plans for addressing or solving the problem. Interestingly, a study by Guastella and Dadds further shows that writing tasks might be structured to lead to differential emotional processing (Guastella & Dadds, 2006). That is, by providing research participants with specific instructions about how they should write about their traumatic experiences, meaningful changes in emotional responses are detected. From the results of Paper III, where the role of health professionals was examined, it would be reasonable to assume that health professionals or "expert users" could provide such instructions or model behavior. Also, Pennebaker and

Francis (1996) investigated the language of emotional writing, and found that health-effects appeared related to the degree of structure and cohesiveness of the language used. This suggest a more complete understanding of the problems described, including that of causality (Pennebaker, Mayne, & Francis, 1997). Health-effects observed in relation to writing about purely imaginary trauma suggest that the task itself might make people more resilient to coping with real-life trauma perhaps through establishment of mental coping mechanisms (Greenberg, Wortman, & Stone, 1996). Thus, rather than being simply cathartic, emotional writing appear to affect the ways people react to their emotions and think about themselves.

Self-perception. Understanding the positive health-effects of writing would seem uniquely relevant for predicting implications of online health communication. A possible theoretical framework related to the self-regulation or restructuring perspectives described here is the process of self-perception. In this context this relates to how people perceive and think about themselves, including perceptions of being "sick", "healthy", "a patient", et cetera.

Theories of self-perception are most often defined relative to the work of Daryl Bem (1972). His theory states that the way inferences are made about our own attitudes and emotions is not very different from the process by which inferences are formed concerning others' attitudes and emotions. This means that identification and labeling of attitudes and emotions – also related to health - in part takes place through observation of our behaviors and the setting in which these behaviors occur. Making inferences about ourselves by observing our own behavior is particularly employed when the attitudes and feelings are uncertain or ambiguous.

The self-perceptions that are formed by observations of our own behavior in this fashion serve important motivational functions. Understanding what motivates people plays an important part in many areas of health research, perhaps no more so than research focusing on adherence to treatment. Research shows that having negative or erroneous self-perceptions related to health decreases adherence to health-care regimens (Wichowski & Kubsch, 1997). Such "incorrect" or ambivalent self-perceptions might reflect what Parsons (1951) called a sick-role conflict. He poses that in order to adhere to treatment, patients need to internalize, or identify, with certain behaviors and attitudes consistent with "being sick", including allowing others to care for them and seeking medical advice. Also, as indicated by the discussion of self-presentation certain health issues might be complex or the central concerns might be quite in conflict with one another. For instance, the need to receive help for a problem might be in conflict with the need to present oneself as a positive and competent individual. This

might be illustrated by some of the answers of respondents in Paper I. For example, that participants felt the themes discussed were sources of shame or embarrassment, and that some issues were undisclosed outside the online context. This is obviously somewhat at odds with the fact the participants were willingly communication with others online about these issues. Resolving this "conflict" of wanting help but not knowing how to get it might thus be a central concern for some patients.

Given the evidence suggesting that the writing cure health-outcomes can be attributed to cognitive processing of emotional issues, the question might be asked: Can text-based CMC function as a tool for revising potentially ambiguous health-related self-perceptions? Indeed, cognitive behavioral therapies, which are based on somewhat similar principles, have shown promising results and are being incorporated into self-help programs (Christensen, Griffiths, & Jorm, 2004; Griffiths, Christensen, Jorm, Evans, & Groves, 2004). Here, the crucial aspects include counteracting dysfunctional thought-patterns and attitudes, including perceptions of stigma related to depression and/or the treatment process.

Indeed, the choice people make by visiting a health-site might be relevant to the process described here. For example, the choice to join a particular discussion forum and actively participating might be important in labeling our attitudes and goals with regards to health. This information might, in turn, influence our health behavior. Because the user initiates these activities voluntarily, this behavior might very well play a central role in consolidating a health-related self-image that includes involvement with regards to health and treatment. This kind of health-related self-perception can increase the likelihood that people engage in health-promoting activities. An example of this might be found in the results from a European e-health trend survey, where 33 percent of the sampled populations say they have increased willingness to change their diet and/or lifestyle after visiting health-related websites (Andreassen et al., 2007).

An information processing perspective on health communication. As mentioned in the discussions of self-disclosure and self-presentation, the anonymity that many forms of computer-mediated communication offer to participants is frequently cited as an explanation for increased self-disclosure. The findings presented in Paper IV challenges this uniform assumption. It is argued that theories drawing solely on the concept of anonymity might overlook important inherent differences between text-based CMC and FTF communication.

The most apparent difference between CMC and FTF communication is the fact that CMC most commonly uses text and writing/typing as the means for communication, whereas FTF communication is speech-based. Crystal (2001) provides an overview of the

distinguishing characteristics of writing and speech (p. 25): "Speech is typically time-bound, spontaneous, face-to-face, socially interactive, loosely structured, immediately revisable, and prosodically rich. Writing is typically space-bound, contrived, visually decontextualized, factually communicative, elaborately structured, repeatedly revisable, and graphically rich." These differences are clearly reflected in asynchronous, text-based conceptualizations of CMC. First, text-based CMC is characterized by the lack of simultaneous feedback. Messages are composed character by character, but in most instances appear complete on the recipients display when they are sent (e.g., by pressing <Enter>, clicking "Send"). Consequently, a period is created in which a participant is left anticipating feedback on their last message. Second, as messages in text-based CMC need to be transmitted through a computer network, the time it takes for a message to arrive is invariably longer than that of a FTF exchange. Indeed, the very process of composition and typing typically takes more time than speaking (Čech & Condon, 1998). It is interesting to note that working with a text appears to facilitate mental processes beyond the writing itself. For instance, students enrolled in writing-intensive classes at university levels experience the writing process as goal-driven, linked to the organization of ideas, and highlighting analytical capabilities, facilitation of deep thinking, and identity building (Hilgers, Hussey, & Stitt-Bergh, 1999). There is limited evidence of similar processes affecting written communication (or rather typed communication) in CMC, but McCreary (1990) noted that the value of written communication in online discussion forums might come from the demands towards exactness, organization of thoughts, and clear expression. Further, higher levels of "critical thinking" has been identified in text-based CMC relative to FTF interaction (Newman, Webb, & Cochrane, 1997), as well as the potential of the medium to support critical inquiry (Garrison, Anderson, & Archer, 2000). The effects of text-based CMC thus actualize a notion of "cognitive presence", both in contrast and supplement to social presence. Cognitive presence, which is presented as a prerequisite of successful educational transactions (Garrison, Anderson, & Archer, 2000), might be equally important for health transactions. In terms of effects of modality on recall of health-related information, a study of patient compliance to postoperative instructions showed that written information was more readily remembered and associated with better adherence to treatment (Blinder, Rotenberg, Peleg, & Taicher, 2001). However, whether such effects are valid for computer-based instruction or communication applications remains unanswered (Kessels, 2003).

The possibilities afforded by the text-medium with regards to increased possibilities for reflection and analysis is similar to the term "zone for reflection" (Suler, 2000). This

concept is defined as the time that exists between exchanges (of, for instance, text messages) to think and compose a reply. The *Media Synchronicity Theory* (MST; Dennis & Valacich, 1999; Dennis, Valacich, Speier, & Morris, 1998) might give increased support to this notion. This theory is an extension of the MRT (Daft & Lengel, 1986) and proposes that communication through ICT might be best understood from an information processing perspective.

Whereas the concept of "richness" is closely tied to social presence, MST focuses on how information can be processed and handled by the individual during communication relative to the goals of the communication task. MST proposes a number of traits that describe the information processing in different media, and rates communication technologies from low to high on these traits. These five traits are immediacy of feedback, symbol variety, parallelism, rehearseability, and reprocessability. Ratings based on these traits yield quite different results when compared to ratings of richness from the perspective of MRT. For instance, FTF communication, which is commonly identified as the richest form of communication (according to MRT), is rated "low" on three of five dimensions in MST (see Table 1). From this perspective FTF communication is only unique with regards to its ability to support rapid feedback during communication (high rating for "immediacy of feedback"). In contrast, text-based CMC (specifically, asynchronous groupware), categorized as one of the "least rich" media according to MRT, receives "high" ratings for three of five dimensions (see Table 1). Such media would enable multiple conversations to exist simultaneously (high rating for "parallelism"), and give the user the opportunity to fine tune the message before sending it (high rating for "rehearseability"), as well as the ability to reexamine the message at a later stage during communication (high rating for "reprocessability"). Thus, MST challenges a conceptualization of richness mainly based on social factors.

Table 1. Relative trait salience of selected media; from Dennis & Valacich, 1999. Typical online, self-help media correspond to asynchronous groupware and electronic mail.

	Feedback	Symbol Variety	Parallelism	Rehearsability	Reprocessability
Face-to-face	high	low-high	low	low	low
Video conference	medium-high	low-high	low	low	low
Telephone	medium	low	low	low	low
Written mail	low	low-medium	high	high	high
Voice mail	low	low	low	low-medium	high
Electronic mail	low-medium	low-high	medium	high	high
Electronic phone ("chat")	medium	low-medium	medium	low-medium	low-medium
Asynchronous groupware	low	low-high	high	high	high
Synchronous groupware	low-medium	low-high	high	medium-high	high

The perspective exemplified by MST can be useful for analyzing health-related CMC. Instead of focusing on how traditional ways of accomplishing social goals can be achieved or approximated through text, it might be asked how text helps individuals manage information differently from the FTF setting (or other settings), and how this helps them achieve their goals. Interestingly, the prototypical "online health" communication arenas (discussion forums, e-mail) rate high on the reprocessability and rehearseability traits proposed by MST (see Table 1). Reprocessability refers to the extent to which a message can be re-examined or processed again, and rehearseability refers to whether the medium allows the sender to rehearse or fine tune a message (Dennis & Valacich, 1999). Given these ratings it might be argued that these traits are central to health-related use of the Internet, perhaps directly accommodating the dual and conflicting goals that certain health issues might activate.

The results presented in Paper IV support an argument that computers and the text-based user-interface allow individuals to process information in more thorough and controlled ways than in "richer" modalities. This notion is supported by MST, and is reflected by Walther's hyperpersonal framework (Walther, 1996). This thesis has argued that the enhanced processing has special significance on an individual level for health-issues, for example through the interplay between health-related self-perceptions and health-behaviors.

Designing Health Services

Group processes: Self-help & therapeutic considerations. The studies presented in Papers I – III involved virtual groups or communities with health as a shared focus. A potential theoretical perspective that extends beyond the individual level is The Social Identity Model of Deindividuation Effects (SIDE, Reicher, Spears, & Postmes, 1995). This

model provides researchers with a theoretical tool for studying online group processes. SIDE, as many competing theories, sees anonymity as a strong force in shaping CMC. Specifically, SIDE regards anonymity as an enhancer of normative behavior by means of reducing the cues available for signaling individual differences. Anonymity in this context is not a precursor of necessarily deviating or regressive behaviors. Formerly, Internet phenomena such as "flaming" were often taken as evidence of the detrimental effects of anonymity on online interaction (Lea, O'Shea, Fung, & Spears, 1992). In such cases individuals were believed to behave in anti-normative ways because their online behavior did not lead to real-life, adverse consequences. In contrast to this view, SIDE proposes that available (in most cases normative) group norms will be made extra salient when the individuals are no longer identifiable (as would be the case for CMC groups). As a result, the communication process and related behaviors would be more likely to stay within the confinements of these norms (e.g., Postmes, Spears, & Lea, 2000; Postmes, Spears, Sakhel, & de Groot, 2001). When these norms involve behavioral consequences, for instance health promoting behaviors, conformity to such norms might have real-life health advantages (e.g., Cohen et al., 2000). In cases such as the online self-help movement, and as reflected in Papers I - III, it might be interesting to view the strong supportive foundations of the activities, as salient normative forces (or as norms in their own right). It is perhaps well founded to talk about such groups, not as providing self-help (individual), but as providing mutual aid (interindividual). The foundations or norms common to these groups and organizations include expectations of member participation and the expectations of receiving emotional support, sharing personal experiences, and finding new ways to cope with their shared problems. Also, the guidelines or rules governing many real-life self-help groups (for instance, the twelve step program of Alcoholics Anonymous (AA)) are very much norms that are to be followed irrespective of setting.

Many similarities might be argued to exist between sharing stories online and, for instance, narrative therapeutic approaches. Participating in online settings similar to those addressed by this thesis will oftentimes involve writing and sharing one's life-story, having others comment and reflect upon these experiences, and revising them over time. Indeed, the possibilities of revision and storage of information might serve as important facets with regards to the psychotherapeutic process (e.g., Löhr, Rosenvinge, Gammon, & Johnsen, 2002; Suler, 2000). Using text or diaries in therapeutic work is not uncommon (e.g., Stensland & Malterud, 1997), but relinquishing control over this process might be viewed as threatening from the therapist's perspective (Wangberg, Gammon, & Spitznogle, 2007).

Low threshold health-services. Knowledge of the positive "side-effects" related to mediated communication technology, specifically increased self-disclosure, could be used advantageously for designing health-services that help patients respond candidly to diagnostic and therapeutic processes that otherwise may be difficult for various reasons (confusion, embarrassment). The results reported previously by Joinson (2001b, 2003) directly support the idea of designing to increase self-disclosure. Likewise, the results of Paper IV suggest that simple changes to a user-interface have marked effects on communication and psychological processes. The experience of participating in these settings, where self-disclosure might be high "per default", might be motivating for people struggling with health-issues. In contrast, it is well known that many neglect seeking appropriate healthcare (Oliver, Pearson, Coe, & Gunnell, 2005). The results presented in Papers I are illustrative of this. Although, 65 percent report having had contact with the healthcare system, 46 percent of participants explicitly state that they had discussed issues with others that they felt unable to discuss FTF. If these issues are central to participants receiving proper care and treatment, this could give cause for concern about the role played by more traditional venues for healthcare.

Providing patients with a "less costly" venue for seeking help might make help minimize such behaviors. Describing our subjective "cost-benefits assessments" for help seeking might be attempted along the lines of an expected utility analysis (von Neuman & Morgenstern, 1944). When seeking help for a health problem the goal is to have this problem resolved through the intervention of the healthcare system. At the same time, help seeking through FTF channels might be associated with considerable subjective costs. In the end, these (subjective) costs will be weighed against the patient's beliefs regarding the seriousness of the problem, and how probable it is that the healthcare system will be able to assist the individual. If this analysis leads to conclusions such as, "this is not a very serious problem" or "the healthcare system will not be able to help me", the threshold for approaching healthcare professionals would have to be very low of help seeking to commence. If the subjective costs of FTF communication are high, for instance in the case of stigmatizing illnesses or "confession" scenarios, avoidance may be expected even for serious problems.

The apparent popularity of online self-help arenas may be explained by viewing them as extreme low threshold situations. These settings offer both the information processing advantages of text, and the anonymity and unaccountability afforded by communication with peers rather than healthcare professionals. Importantly, though, the fact that 68 percent of respondents in Paper I preferred health-professionals to play an active part suggests that introduction of similar arenas within the traditional healthcare system should be feasible. As

shown in Paper III, involvement of health-professionals should be expected to have marked effects on the communication process (for instance, with more direct questions being asked), but not at the cost of the positive experiences of social support. Also, the role that health professionals might play in these settings, both as moderators and role models should not be underestimated. For instance, the destructiveness experienced in the forums for eating disorders (Paper II) could lead to different "results" with the involvement of a health professional. It could be that the therapeutic potential of writing about ones problems could have been explored (similar to emotional writing), both for the individual in question and the group in general. In sum, the experience of having successfully disclosed ones problems to others might facilitate the inclination to seek help from official channels, despite the fact that these settings can never offer participants complete anonymity.

An interesting notion, logically related to the findings of Paper IV, is the idea that control over information flow might make anonymity a less important concept, as anonymity is probably most relevant when individuals fear being misinterpreted or misunderstood. People that doubt their ability to present problems accurately FTF, and therefore shy away from seeking help in a traditional sense, might be swayed by the possibility of writing about their problems in a controllable environment. This writing-process could be conducted spontaneously (and acutely) as problems occur, or over a period of time. In both scenarios the possibilities of reprocessing and rehearsing content is equally relevant, but on different time scales. This would constitute a type of quality control over information that is difficult to achieve, at least within the traditional doctor-patient consultation. Interestingly, findings also suggest that FTF communication that has been preceded by CMC communication is judged as reflecting a greater diversity of perspectives than FTF that have not been preceded by CMC (Dietz-Uhler & Bishop-Clark, 2001). This might suggest that CMC could be ideally utilized prior to a formal consultation between physician and patient, for instance in connection to making an appointment. If such "perspective diversity" could solve problems related to the formerly discussed patient's agenda is not clear however.

Limitations

Generalization. A specific quality related to these findings is that health-communication on the Internet was an emergent phenomena as these studies were conducted. Also the developments relating to use of information technologies are quite rapid, both in terms of demographics and use patterns. Some aspects of the results presented in this thesis might be sensitive to these developments. For instance, as greater percentages of the

population now have access to the Internet, more people might be utilizing services such as those investigated. Consequently a sample of participants today, compared to when these studies were performed, might better represent the general population rather than subgroups or special interests.

Conceptual considerations. The findings of Bargh et al. (2002), that people seemed to express more of their "true" qualities over the Internet compared to FTF interaction, have been used as indirect evidence for the possible positive effects of online health-communication (McKenna, 2003, September). From a therapeutic perspective the positive effects would then be akin to catharsis; both inspired by the Jungian origins of the "true self-concept" and the derived notion of the "real me" (Bargh et al., 2002). Telling others about our problems should have positive effects in itself, and the medium (in this case text-based communication) appear to facilitate or support this process. However, the evidence suggesting a link between health and a concept such as the true self is first and foremost anecdotal. Indeed, as health behavior is not doubt motivated by quite specific goals, the hypothesis that revealing information (general self-disclosure) in itself should be positive for health communication is not well supported.

Alternative variables. In the attempts to understand why people choose online venues for communicating about health issues, the aspect of *accessibility* has not been given much attention. The fact is that the online settings are far more accessible than the traditional healthcare system. When seeking out information users simply need to go online on their personal computer, rather than having to set up an appointment with their physician. For a person seeking general health information this fact should weigh heavily in favor of using the Internet, as their inquiries are most often less than acute and thus does not require direct access to a physician. Despite the questions that might be raised in terms of the quality of information found online (e.g., Berland et al., 2001; Purcell, Wilson, & Delamothe, 2002), and as a consequence whether people trust this information (Hesse et al., 2005), a substantial number of people are using the Internet in this manner. A recent investigation of European citizens' use of the Internet for health purposes showed that 41 percent of the total sampled population, and 71 percent of Internet users, had used the Internet for health purposes. Among the various categories of use described as "health purposes", the dominant activity was reading about health or illness (33 percent of the total population). Interacting with health professionals was less frequently indicated (19 percent; Andreassen et al., 2007).

Known problems of text-based communication. This thesis has addressed the potential that text-based, electronically mediated communication might have for health issues and

users/patients. Through this discussion the possibilities for controlled information processing have been highlighted, specifically how such processing might be beneficial for combating miscommunication of important and sensitive health issues. Research has shown that even text-based communication that share the characteristics of those described herein might be associated with problems. A series of studies of e-mail communication (Epley & Kruger, 2005; Kruger, Epley, Parker, & Ng, 2005) indicated that people are overconfident in their abilities to communicate over e-mail. Effects relating to egocentrism might help explain these effects because e-mail communicators might have "inside" information concerning their message that the audience has not, for example whether a message is intended to be funny or sarcastic (Kruger et al., 2005). Importantly, the ambiguity of CMC, through the lack of non-verbal cues, might be associated with increased influence of negative stereotypes and expectancies (Epley & Kruger, 2005). It remains unclear how these issues might influence health communication specifically, but awareness of problems that might be associated with communication of complex or emotional contents is valuable. Also, and as noted by Kruger et al. (2005), changes towards increasing synchronicity and the rapidity of message exchange (through for instance instant messaging), perhaps in an attempt to mimic FTF communication, might probably just increase these and related problems.

Conclusion

This thesis has investigated online health communication from several angles. First and foremost, it has answered several questions concerning the activities of online self-help groups, including questions concerning self-disclosure and the health-promoting aspects of these groups. Furthermore, the influence of information processing capabilities of CMC, rather than social aspects, on self-presentation and self-perception has been investigated by conducting two experimental studies. Together these studies serve as a foundation for formulating the theoretical perspectives put forward in this dissertation, i.e., the psychological foundations of communicating about ones health through technology.

From this perspective it is argued that developments within an area such as patient-centered e-health will depend upon a better understanding of why people use CMC for communicating about their health. Importantly it is suggested that efforts to design "rich" e-health systems in order to impersonate in-person encounters is not necessarily such a good idea. Assumptions about the invariable superiority of FTF communication in building supportive relationships may inadvertently bypass valuable relational features of "faceless"

and "old-fashioned" modes of communication (e.g., voice and text). Another formulation of this notion was made as early as 1992 by Hollan and Stornetta who stated that communication tools should be developed that did not simply imitate physical proximity (FTF) but that went "beyond being there" (p. 125): "The goal (…) becomes identifying needs which are not ideally met in the medium of physical proximity and evolving mechanisms which leverage the strengths of the new medium to meet those needs." In some ways this notion has come true through the users that are currently utilizing "poor" media to communicate about themselves and their health. The inherent potential in designing health services that combine the involvement and quality control of health professionals, while addressing people's need for control over self-presentation and facilitate health-promoting self-reflection, should be investigated further.

References

Addis, M. E., & Mahalik, J. R. (2003). Men, masculinity, and the contexts of help seeking. *American Psychologist, 58*(1), 5-14.

Andreassen, H. K., Bujnowska-Fedak, M. M., Chronaki, C. E., Dumitru, R. C., Pudule, I., Santana, S., Voss, H., & Wynn, R. (2007). European citizens' use of e-health services: A study of seven countries [Electronic Version]. *BMC Public Health*. Retrieved February 6, 2008, from http://www.biomedcentral.com/1471-2458/7/53.

Barak, A. (1999). Psychological applications on the Internet: A discipline of on threshold of a new millennium. *Applied and Preventive Psychology, 8*, 231-246.

Barbee, A. P. (1990). Interactive coping: The cheering-up process in close relationships. In S. W. Duck (Ed.), *Personal Relationships and Social Support* (pp. 46-65). London: Sage.

Barbee, A. P., & Cunningham, M. R. (1995). An experimental approach to social support communications: Interactive coping in close relationships. In B. R. Burleson (Ed.), *Communication Yearbook 18* (pp. 381-413). Thousand Oaks, CA: Sage.

Bargh, J. A., McKenna, K. Y. A., & Fitzsimons, G. J. (2002). Can you see the real me? The activation and expression of the 'true self' on the Internet. *Journal of Social Issues, 5*, 33-48.

Baumeister, R. F., Hutton, D. G., & Tice, D. M. (1989). Cognitive processes during deliberate self-presentation: How self-presenters alter and misinterpret the behavior of their interaction partners. *Journal of Experimental Social Psychology, 25*, 59-78.

Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (pp. 1-62). New York: Academic Press.

Berland, G. K., Elliott, M. N., Morales, L. S., Algazy, J. I., Kravitz, R. L., Broder, M. S., Kanouse, D. E., Muñoz, J. A., Puyol, J. –A., Lara, M., Watkins, K. E., Yang, H., & McGlynn, E. A. (2001). Health information on the Internet: Accessibility, quality, and readability in English and Spanish. *Journal of the American Medical Association, 285*(20), 2612-2621.

Biddle, L., Gunnell, D., Sharp, D., & Donovan, J. L. (2004). Factors influencing help seeking in mentally distressed young adults: A cross-sectional survey. *British Journal of General Practice, 54*(501), 248-253.

Blinder, D., Rotenberg, L., Peleg, M., & Taicher, S. (2001). Patient compliance to instructions after oral surgical procedures. *International Journal of Oral & Maxillofacial Surgery, 30*, 216-219.

Bugge, S., & Vikøyr, H. (2000). Tok farvel på nettet. *VG.* Retrieved March 26, 2008, from http://www.vg.no/nyheter/innenriks/artikkel.php?artid=2242190.

Cameron, L. D., & Nicholls, G. (1998). Expression of stressful experiences through writing: Effects of a self-regulation manipulation for pessimists and optimists. *Health Psychology, 17*(1), 84-92.

Campbell, R. S., & Pennebaker, J. W. (2003). The secret life of pronouns: Flexibility in writing style and physical health. *Psychological Science, 14*(1), 60-65.

Campion, P. D., Butler, N. M., & Cox, A. D. (1992). Principle agendas of doctors and patients in general practice consultations. *Family Practice, 9*(2), 181-190.

Čech, C. G., & Condon, S. L. (1998). Message size constraints on discourse planning in synchronous computer-mediated communication. *Behavior Research Methods, Instruments, & Computers, 30*(2), 255-263.

Čech, C. G., & Condon, S. L. (2004). Temporal properties of turn-taking and turn-packaging in synchronous computer-mediated communication. *Proceedings of 37th HICSS'04* (pp. 107-116). Big Island, HI: IEEE Press.

Chester, A., & Gwynne, G. (1998). Online teaching: Encouraging collaboration through anonymity. *Journal of Computer-Mediated Communication, 4*(2). Retrieved April 28, 2008, from http://jcmc.indiana.edu/vol4/issue2/chester.html

Christensen, H., Griffiths, K. M., & Jorm, A. F. (2004). Delivering interventions for depression using the internet: randomised controlled trial. *British Medical Journal, 328*, 265.

Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social Support Measurement and Intervention: A Guide for Health and Social Scientists* (pp. 3-25). New York: Oxford University Press.

Crystal, D. (2001). *Language and the Internet.* Cambridge, UK: Cambridge University Press.

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science, 32*(5), 554-571.

Davison, K. P., Pennebaker, J. W., & Dickerson, S. S. (2000). Who talks? The social psychology of illness support groups. *American Psychologist, 55*(2), 205-217.

Dennis, A. R., & Valacich, J. S. (1999). *Rethinking Media Richness: Towards a Theory of Media Synchronicity.* Paper presented at the 32nd Hawaii International Conference on System Sciences (HICSS), Maui, Hawaii, USA, January 5-8. IEEE Computer Society.

Dennis, A. R., Valacich, J. S., Speier, C., & Morris, M. G. (1998). *Beyond Media Richness: An Empirical Test of Media Synchronicity Theory.* Paper presented at the 31st Hawaii International Conference on System Sciences (HICSS), Kohala Coast, Hawaii, USA, January 6-9. IEEE Computer Society.

Derlega, V. J., Metts, S., Petronio, S., & Margulis, S. T. (1993). *Self-Disclosure.* Newbury Park, CA: Sage Publications.

Dietz-Uhler, B., & Bishop-Clark, C. (2001). The use of computer-mediated communication to enhance subsequent face-to-face discussions. *Computers in Human Behavior, 17*, 269-283.

Dunham, P. J., Hurshman, A., Litwin, E., Gusella, J., Ellsworth, C., & Dodd, P. W. D. (1998). Computer-mediated social support: Single young mothers as a model system. *American Journal of Community Psychology, 26*(2), 281-306.

Eichstadt, J., & Silva, P. J. (2003). Noticing the self: Implicit assessment of self-focused attention using word recognition latencies. *Social Cognition, 21*(5), 349-361.

Elstad, T. (1999). *Sosial integrasjon blant mennesker med alvorlige psykiske lidelser [The Social Integration of People with Severe Mental Disorders].* (SINTEF Rapport STF78 A995062). Trondheim, Norway: SINTEF Unimed - Norsk institutt for sykehusforskning.

Epley, N., & Kruger, J. (2005). When what you type isn't what they read: The perseverance of stereotypes and expectancies over e-mail. *Journal of Experimental Social Psychology, 41*, 414-422.

Eysenbach, G., Powell, J., Englesakis, M., Rizo, C., & Stern, A. (2004). Health related virtual communities and electronic support groups: Systematic review of the effects of online peer to peer interactions. *British Medical Journal, 328*, 1166-1170.

Ferguson, T. (1996). *Health Online: How to Find Health Information, Support Groups, and Self-Help Communities in Cyberspace.* Reading, Mass: Perseus Books.

Ferris, P. (1997). What is CMC? An overview of scholarly definitions. CMC Magazine, January 1997. Retrieved January 22, 2008, from http://www.december.com/cmc/mag/1997/jan/ferris.html

Ferriter, M. (1993). Computer aided interviewing and the psychiatric social history. *Social Work and Social Sciences Review, 4*, 255-263.

Finfgeld, D. L. (2000). Therapeutic groups online: The good, the bad, and the unknown. *Issues in Mental Health Nursing, 21*, 241-255.

Finn, J. (1993). An exploration of computer-based self-help/mutual aid groups. In B. Glastonbury (Ed.), *Human Welfare and Technology: Papers from the HUSITA 3 Conference in IT and the Quality of Life and Services* (pp. 70-79). Assen, Netherlands: Van Gorcum.

Finn, J., & Lavitt, M. (1994). Compter-based self-help groups for sexual abuse survivors. *Social Work with Groups, 17*, 21-46.

Fiske, S. T., & Taylor, S. E. (1991). *Social Cognition* (2nd Edition). New York: McGraw-Hill, Inc.

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2-3), 87-105.

Gibbs, J. L., Ellison, N. B., & Heino, R. D. (2006). Self-presentation in online personals: The role of anticipated future interaction, self-disclosure, and perceived success in Internet dating. *Communication Research, 33*(2), 152-177.

Gleason, N. A. (1995). A new approach to disordered eating – using an electronic bulletin board to confront social pressure on body image. *Journal of American College Health, 44*, 78-80.

Greenberg, M. A., Wortman, C. B., & Stone, A. A. (1996). Emotional expression and physical health: Revising traumatic memories or fostering self-regulation? *Journal of Personality and Social Psychology, 71*(3), 588-602.

Greist, J. H., Klein, M. H., & VanCura, L. (1973). A computer interview by psychiatric patient target symptoms. *Archives of General Psychiatry, 29*, 247-253.

Griffiths, K. M., Christensen, H., Jorm, A. F., Evans, K., & Groves, C. (2004). Effect of web-based depression literacy and cognitive-behavioral therapy interventions on stigmatising attitudes to depression. *British Journal of Psychiatry, 185*, 342-349.

Guastella, A. J., & Dadds, M. R. (2006). Cognitive-behavioral models of emotional writing: a validation study. *Cognitive Therapy and Research, 30*, 397-414.

Hara, N., Bonk, C. J., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology. *Instructional Science, 28*(2), 115-152.

Henri, F. (1992). Computer conferencing and content analysis. In A. R. Kaye (Ed.), *Collaborative Learning Through Computer Conferencing: The Najaden Papers* (pp. 117-136). Berlin: Springer Verlag.

Hesse, B. W., Nelson, D. E., Kreps, G. L., Croyle, R. T., Arora, N. K., Rimer, B. K., & Viswanath, K. (2005). Trust and sources of health information. *Archives of Internal Medicine, 165*, 2618-2624.

Hilgers, T. L., Hussey, E. L., & Stitt-Bergh, M. (1999). "As you're writing, you have these epiphanies": What college students say about writing and learning in their majors. *Written Communication, 16*(3), 317-353.

Hollan, J., & Stornetta, S. (1992). Beyond being there. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 119-125). New York: ACM Press.

Howell-Richardson, C., & Mellar, H. (1996). A methodology for the analysis of patterns of participation within computer mediated communication courses. *Instructional Science, 24*, 47-69.

Isaacs, E., Whittaker, S., Frohlich, D., & O'Conaill, B. (1994). Informal communication re-examined: New functions for video in supporting opportunistic encounters. In K. E. Finn, A. J. Sellen, & S. B. Wilbur (Eds.), *Video-Mediated Communication* (pp. 459-485). Mahwah, NJ: Lawrence Erlbaum.

Jeong, A. C. (2003). Sequential analysis of group interaction and critical thinking in online threaded discussions. *The American Journal of Distance Education, 17*(1), 25-43.

Joinson, A. N. (1999). Anonymity, disinhibition and social desirability on the Internet. *Behavior Research Methods, Instruments, & Computers, 31*, 433-438.

Joinson, A. N. (2001a). Knowing me, knowing you: Reciprocal self-disclosure on the Internet. *CyberPsychology & Behavior, 4*, 587-591.

Joinson, A. N. (2001b). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology, 31*, 177-192.

Joinson, A. N. (2003). *Understanding the Psychology of Internet Behaviour.* New York: Palgrave Macmillan.

Joinson, A. N. (2004). Self-esteem, interpersonal risk, and preference for e-mail to face-to-face communication. *CyberPsychology & Behavior, 7*(4), 472-478.

Joinson, A. N., McKenna, K. Y. A., Postmes, T., & Reips, U.-D. (Eds.). (2007). *The Oxford Handbook of Internet Psychology.* Oxford: Oxford University Press.

Kam, L. E., & Chismar, W. G. (2003). *A Self-Disclosure Model for Personal Health Information.* Paper presented at the 36th Hawaii International Conference on System Sciences, Hawaii.

Kazdin, A. E. (1998). *Research Design in Clinical Psychology* (3rd ed.). Needham Heights, MA: Allyn and Bacon.

Kessels, R. P. C. (2003). Patients' memory for medical information. *Journal of the Royal Society of Medicine, 96*, 219-222.

King, S. A., & Moreggi, D. (1998). Internet therapy and self-help groups - the pros and cons. In J. Gackenbach (Ed.), *The Psychology of the Internet: Intrapersonal, Interpersonal and Transpersonal Implications* (pp. 77-109). San Diego, CA: Academic Press.

King, S. A., & Poulos, S. T. (1998). Using the Internet to treat generalized social phobia and avoidant personality disorder. *CyberPsychology & Behavior, 1*, 29-36.

Kraut, R., Lundmark, V., Patterson, M., Kiesler, S., Mukopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist, 53*, 1017-1031.

Kruger, J., Epley, N., Parker, J., & Ng, Z. –W. (2005). Egocentrism over e-mail: Can we communicate as well as we think? *Journal of Personality and Social Psychology, 89*(6), 925-936.

Lange, A., van de Ven, J. –P., Schrieken, B., & Emmelkamp, P. M. G. (2001). Interapy. Treatment of posttraumatic stress through the Internet: A controlled trial. *Journal of Behavior Therapy and Experimental Psychiatry, 32*, 73-90.

Laurenceau, J.-P., Barrett, L. F., & Pietromonaco, P. R. (1998). Intimacy as an interpersonal process: The importance of self-disclosure, partner disclosure, and perceived partner responsiveness in interpersonal exchanges *Journal of Personality and Social Psychology, 74*(5), 1238-1251.

Lea, M., O'Shea, T., Fung, P., & Spears, R. (1992). "Flaming" in computer-mediated communication: Observations, explanations and implications. In M. Lea (Ed.), *Contexts of Computer-Mediated Communication* (pp. 89-112). London: Harvester-Wheatsheaf.

Lea, M., & Spears, R. (1995). Love at first byte? Building personal relationships over computer networks. In J. T. Wood & S. Duck (Eds.), *Understudied Relationships: Off the Beaten Track* (pp. 197-233). Newbury Park, CA: Sage.

Lebow, J. (1998). Not just talk, maybe some risk: The therapeutic potentials and pitfalls of computer-mediated communication. *Journal of Martial and Family Therapy, 24*, 203-206.

Leary, M. R., Tchividjian, L. R., & Kraxberger, B. E. (1994). Self-presentation can be hazardous to your health: Impression management and health risk. *Health Psychology, 13*, 461-470.

Levenstein, J. H., McCracken, E. C., McWhinney, I. R., Stewart, M. A., & Brown, J. B. (1986). The patient-centred clinical method, 1: A model for the doctor-patient interaction in family medicine. *Family Practice, 3*(1), 24-30.

Littrell, J. (1998). Is the re-experience of painful emotion therapeutic? *Clinical Psychology Review, 18*(1), 71-102.

Livingstone, S. (2003). Children's use of the Internet: Reflections on the emerging research agenda. *New Media & Society, 5*(2), 147-166.

Lorig, K. R., Laurent, D. D., Deyo, R. A., Marnell, M. E., Minor, M. A., & Ritter, P. L. (2002). Can a back pain e-mail discussion group improve health status and lower health care costs? A randomized study. *Archives of Internal Medicine, 162*, 792-796.

Löhr, H., Rosenvinge, J. H., Gammon, D., & Johnsen, J. –A. K. (2002). Kan Internett hjelpe mennesker med alvorlige psykiske lidelser? Brukererfaringer i et klinsk perspektiv [Can Internet be helpful for individuals with serious mental disorders? User experiences from a clinical perspective]. *Tidsskrift for norsk psykologforening, 39*, 514-519.

Madara, E. J. (1997). The mutual-aid self-help online revolution. *Social Policy, 27*(3), 20-26.

Marra, R. (2006). A review of research methods for assessing content of computer-mediated discussion forums. *Journal of Interactive Learning Research, 17*(3), 243-267.

Martin Ginis, K. A., & Leary, M. R. (2004). Self-presentational processes in health-damaging behavior. *Journal of Applied Sport Psychology, 16*, 59-74.

Martin, K. A., Leary, M. R., & Rejeski, W. J. (2000). Self-presentational concerns in older adults: Implications for health and well-being. *Basic and Applied Social Psychology, 22*(3), 169-179.

Mason, R. (1992). Evaluation methodologies for computer conferencing applications. In A. R. Kaye (Ed.), *Collaborative Learning Through Computer Conferencing: The Najaden Papers* (pp. 105-116). Berlin: Springer Verlag.

McCreary, E. K. (1990). Three behavioral models for computer-mediated communication. In L. M. Harasim (Ed.), *Online Education: Perspectives on a New Environment* (pp. 117-130). New York: Praeger.

McKenna, K. Y. A. (2003, September). *The Implications of Belonging in Cyberspace.* Presented at the Tromsø Telemedicine & eHealth Conference 2003, Tromsø, Norway.

McKenna, K. Y. A., & Bargh, J. A. (1998). Coming out in the age of the internet : Identity demarginalization through virtual group participation. *Journal of Personality and Social Psychology, 75*(3), 681-694.

McKenna, K. Y. A., & Bargh, J. A. (1999). Causes and consequences of social interaction on the Internet: A conceptual framework. *Media Psychology, 1*, 249-269.

McKenna, K. Y. A., Green, A. S., & Gleason, M. E. J. (2002). Relationship formation on the Internet: What's the big attraction? *Journal of Social Issues, 58*(1), 9-31.

Möller-Leimkühler, A. M. (2002). Barriers to help-seeking by men: A review of sociocultural and clinical literature with particular reference to depression. *Journal of Affective Disorders, 71*, 1-9.

Nardi, B., Whittaker, S., & Bradner, E. (2000). *Interaction and Outeraction: Instant Messaging in Action.* Paper presented at the CSCW 2000, Philadelphia, Pennsylvania, USA.

Newman, D. R., Webb, B., & Cochrane, C. (1997). Evaluating the quality of learning in computer supported cooperative learning. *Journal of the American Society for Information Science, 48*(6), 484-495.

O'Sullivan, P. B. (2000). What you don't know won't hurt me: Impression management functions of communication channels in relationships. *Human Communication Research, 26*(3), 403-431.

Oliver, M. I., Pearson, N., Coe, N., & Gunnell, D. (2005). Help-seeking behaviour in men and women with common mental health problems: Cross-sectional study. *British Journal of Psychiatry, 186*(4), 297-301.

Parks, M. R., & Floyd, K. (1996). Making friends in cyberspace. *Journal of Communication, 46*(1), 80-97.

Parks, M. R., & Roberts, L. E. (1998). "Making MOOsic": The development of personal relationships on-line and a comparison to their off-line counterparts. *Journal of Social and Personal Relationships, 15*(4), 517-537.

Parsons, T. (1951). *The Social System*. London: Routledge.

Pennebaker, J. W. (1997). *Opening Up: The Healing Power of Expressing Emotions* (2nd ed.). New York: The Guilford Press.

Pennebaker, J. W. (2004). Theories, therapies, and taxpayers: On the complexities of the expressive writing paradigm. *Clinical Psychology: Science and Practice, 11*, 138-142.

Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95*, 274-281.

Pennebaker, J. W., & Francis, M. E. (1996). Cognitive, emotional and language processes in disclosure. *Cognition and Emotion, 10*, 621-626.

Pennebaker, J. W., Mayne, T. J., & Francis, M. E. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology, 72*, 863-871.

Postmes, T., Spears, R., & Lea, M. (2000). The formation of group norms in computer-mediated communication. *Human Communication Research, 26*(3), 341-371.

Postmes, T., Spears, R., Sakhel, K., & de Groot, D. (2001). Social influence in computer-mediated communication: The effects of anonymity on group behavior. *Personality and Social Psychology Bulletin, 27*(10), 1243-1254.

Preece, J. (1999). Empathic communities: Balancing, emotional and factual communication. *Interacting with Computers, 12*, 63-77.

Purcell, G. P., Wilson, P., & Delamothe, T. (2002). The quality of health information on the Internet. *British Medical Journal, 324*, 557-558.

Ray, W. J. (1997). *Methods Toward a Science of Behavior and Experience* (5th ed.). Pacific Grove, CA: Brooks/Cole Publishing Company.

Reicher, S. D., Spears, R., & Postmes, T. (1995). A social identity model of deindividuation phenomena. In W. Stroebe & M. Hewstone (Eds.), *European Review of Social Psychology* (Vol. 6, pp. 161-198). Chichester, UK: Wiley.

Reid, E. (1998). The self and the Internet: Variations on the illusion of one self. In I. J. Gackenbach (Ed.), *Psychology and the Internet: Intrapersonal, Interpersonal, and Transpersonal Implications* (pp. 29-41). San Diego, CA: Academic Press.

Rheingold, H. (1993). *The Virtual Community: Homesteading on the Electronic Frontier.* New York: Perseus Books.

Riegelsberger, J., Sasse, M. A., & McCarthy, J. D. (2005). Rich media, poor judgement? A study of media effects on users' trust in expertise. In T. McEwan, J. Gulliksen & D. Benyon (Eds.), *People and Computers XIX – The Bigger Picture: Proceedings of HCI 2005* (pp. 267-284). London: Springer.

Robinson, R., & West, R. (1992). A comparison of computer and questionnaire methods of history-taking in a genito-urinary clinic. *Psychology and Health, 6*, 77-84.

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (2001). Methodological issues in the content analysis of computer conference transcripts. *International Journal of Artificial Intelligence in Education, 12*, 8-22.

Rourke, L., Anderson, T., Garrison, D. R., & Archer, W. (1999). Assessing social presence in asynchronous text-based computer conferencing. *Journal of Distance Education, 14*(2), 50-71.

Salem, D. A., Bogat, G. A., & Reid, C. (1997). Mutual help goes online. *Journal of Community Psychology, 25*, 189-207.

Schlenker, B. R. (2003). Self-Presentation. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of Self and Identity* (pp. 492-518). New York: The Guilford Press.

Schliemann, T., Asting, T., Følstad, A., & Heim, J. (2002). *Medium Preference and Medium Effects in Person-Person Communication.* Paper presented at the CHI 2002, Minneapolis, Minnesota, USA.

Short, J., Williams, E., & Christie, B. (1976). *The Social Psychology of Telecommunications.* Toronto, ON: Wiley.

Silva, P. J. (2002). Self-awareness and emotional intensity. *Cognition and Emotion, 16*(2), 195-216.

Smyth, J. M. (1998). Written emotional expression: Effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology, 66*(1), 174-184.

Stein, D. J. (1997). Internet addiction, Internet psychotherapy. *American Journal of Psychiatry, 154*, 890.

Stensland, P., & Malterud, K. (1997). New gateways to dialogue in general practice: Development of an illness diary to expand communication. *Scandinavian Journal of Primary Health Care, 15*, 175-179.

Suler, J. R. (2000). Psychotherapy in cyberspace: A 5-dimensional model of online and computer-mediated psychotherapy. *CyberPsychology & Behavior, 3*(2), 151-159.

Talamo, A., & Ligorio, B. (2001). Strategic identities in cyberspace. *CyberPsychology & Behavior, 4*(1), 109-122.

Tidwell, L. C., & Walther, J. B. (2002). Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations: Getting to know one another a bit at a time. *Human Communication Research, 28*(3), 317-348.

Toro, P. A., Zimmermann, M. A., Seidman, E., Reischl, T. M., Rappaport, J., Luke, D. A., & Roberts, L. J. (1988). Professionals in mutual help groups: Impact on social climate and members' behavior. *Journal of Consulting and Clinical Psychology, 56*, 631-632.

Turkle, S. (1995). *Life on the Screen: Identity in the Age of the Internet*. New York: Simon & Schuster, Inc.

von Neuman, J., & Morgenstern, O. (1944). *The Theory of Games and Economic Behavior*. Princeton, NJ: Princeton University Press.

Waldron, V. R., Lavitt, M., Kelley, D. (2000). The nature and prevention of harm in technology-mediated self-help settings: Three exemplars. *Journal of Technology in Human Services, 17*, 269-293.

Walther, J. B. (1995). Relational aspects of computer-mediated communication: Experimental observations over time. *Organization Science, 6*, 186-203.

Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research, 23*, 3-43.

Walther, J. B. (2007). Selective self-presentation in computer-mediated communication: Hyperpersonal dimensions of technology, language, and cognition. *Computers in Human Behavior, 23*, 2538-2557.

Walther, J. B., & Burgoon, J. K. (1992). Relational communication in computer-mediated interaction. *Human Communication Research, 19*, 50-88.

Wangberg, S., Gammon, D., & Spitznogle, K. (2007). In the eyes of the beholder: Exploring psychologists' attitudes towards and use of eTherapy in Norway. *CyberPsychology & Behavior, 10*(3), 418-423.

Wichowski, H. C., & Kubsch, S. M. (1997). The relationship of self-perception of illness and compliance with health care regimens. *Journal of Advanced Nursing, 25*, 548-553.

Winston, J. S., Strange, B., O'Doherty, J., & Dolan, R. J. (2002). Automatic and intentional brain responses during evaluation of trustworthiness of faces. *Nature Neuroscience, 5*(3), 277-283.

Winzelberg, A. (1997). The analysis of an electronic support group for individuals with eating disorders. *Computers in Human Behavior, 13*, 393-407.

Wright, J. (2002). Online counselling: Learning from writing therapy. *British Journal of Guidance & Counselling, 30*(3), 287-298.

Young, K. S. (1996). Psychology of computer use: XL. Addictive use of the Internet: A case that breaks the stereotype. *Psychological Reports, 79*, 899-902.

Papers I - IV

PAPER I

Kummervold, P. E., Gammon, D., Bergvik, S., Johnsen, J. -A. K., Hasvold, T., & Rosenvinge, J. H. (2002). Social support in a wired world: Use of mental health forums in Norway. *Nordic Journal of Psychiatry, 56*, 59-65.

PAPER II

Johnsen, J. -A. K., Rosenvinge, J. H., & Gammon, D. (2002). Online group interaction and mental health: An analysis of three online discussion forums. *Scandinavian Journal of Psychology, 43*, 445-449.

PAPER III

Johnsen, J. -A. K., Steinsvik, O. O., & Gammon, D. (2003). Health-care professionals'
participation in an online discussion forum: The impact on structure, content and interaction.
Journal of Technology in Human Services, 22, 31-44.

PAPER IV

Johnsen, J. –A. K. (2007). Constraints on message size in quasi-synchronous computer mediated communication: Effect on self-concept accessibility. *Computers in Human Behavior, 23*, 2269-2284.