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Online Social Support: Benefits of an Interdisciplinary Approach for Studying and Designing Cooperative Computer-Mediated Solutions

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Abstract. This paper deals with methodological issues about the study and the design of computer-mediated solutions for online social support. First, we expose lacks in existing studies in the field of online social support. We have identified limits on three dimensions: methodological, conceptual and instrumental. Based on this critical analysis, we then describe our proposition of an interdisciplinary methodology (called MISS), involving psychology, sociology, computer science and conversational analysis. The role of each of these disciplines is described and discussed. As an illustration, we present the first results of the analysis of a corpus taken from a forum.

Keywords: online social support, methodological issues, design, interdisciplinary

1 Introduction

Social support describes activities related to giving some advices, some information, or emotional, psychological, or material support to people facing a difficult situation (disease, stress, loss of a job…). Social support is usually provided by relatives, friends, family, or, for a professional version, by experts (psychologists or social workers for instance). But, by looking on the Internet, we can notice a new phenomenon arising for a few years: social support provided by peers, who are not relatives or professionals, mostly by using forums. We can quote medical web sites where sick people exchange information (900000 connections per day in 2007 for the French web site *Doctissimo*), forums dedicated to pregnant women, over-weighted, children education … This phenomenon gives food for thought: how could a support provided by unknown people be useful?

Several studies, especially in North America, are dedicated to this phenomenon. Based on a critical analysis of these studies, our aim is to define and develop new innovative online services to face the actual social demand due to several observable

facts: diminishing of the social link (distance from family, big cities …), increasing of remote coverage (home medical care …), and difficulties experienced by traditional medical systems in following heavy pathologies.

From a scientific perspective, we aim at improving existing work on computer-mediated social support on three dimensions; methodological, conceptual, and instrumental:

1. From a methodological point of view, we intend to implement an action-research process combining social sciences and computer science. Our challenge is to succeed in modeling an activity (social support) which is difficult to describe.
2. From a conceptual point of view, we plan (1) to describe finely and to understand computer-mediated social support activities, (2) to define a model of computer-mediated social support which would be theoretically founded, and empirically tested (3), to define the role of "Web 2.0" technologies in the rise of new interactive practices.
3. From an instrumental point of view, we will develop innovative online services.

In this paper, we first define what is (online) social support. Then, we expose lacks in existing studies in the field of social support on three dimensions (methodological, conceptual and instrumental). Based on this critical analysis, we then describe our proposition of an interdisciplinary methodology (called MISS), involving psychology, sociology, computer science and conversational analysis. The role of each of these disciplines will be discussed. As an illustration, we will present the first results of the analysis of a corpus taken from a forum.

2 Related Work

2.1 Definitions of Social Support

Barnes & Duck [1] propose a general definition: social support is an exchange of verbal and non verbal messages, which transmit emotion or information in order to reduce the uncertainty or the stress of a person. Directly or indirectly, lending social support to a person implies the recognition of its value. Even if the support is informational, affection is the main dimension of social support, which is a comforting communication [2]. Several studies about social support propose a typology of the different types of support:

- Emotional support (bringing comfort, friendship, love, sympathy [3]) which is a basic component of social support.
- Informational support (bringing information, advices, opinions, judgments [4]) which allows a person to evaluate and understand its problem [5].
- Tangible support (bringing instrumental or material help, for example goods or services).

2.2 Existing Technical Solutions for Social Support

We can identify two families of technical solutions for social support:

- Platforms dedicated to patients (or their relatives) needing long and constant care. These solutions always integrate one or several forums for discussions between patients or between relatives. Sometimes, health professionals can participate. The most advanced features we can find are systems to collect medical data to improve decision making (about treatments for instance). We can find that in CHESS [6] or MAPS-LifeLine for handicapped [7]. Finally, some of these platforms propose virtual reality environments. We can quote Zora [8] or HutchWorld [9].
- Plain forums:
  - Forums dedicated to a special group (created by an association or a medical practitioner). The aim is to continue online the face to face discussions taking place during support groups, and to provide support to distant people who cannot join these groups [10]
  - Public forums, opened by individuals who wish to share their experience and to obtain information and/or psychological or emotional support.

2.3 Studies about Online Social Support

Since the beginning of the 90's, a lot of studies focus on computer-mediated social support. They come under social or experimental psychology, medicine, computer-mediated communication, and computer science. Studies in management science, HCI, or CSCW are more unusual. The observed situations are mostly related with medical questions, social support being provided to sick people, their relatives or the care staff.

Several studies deal with the question of benefits and drawbacks. On one hand, many benefits are underlined: the media accessibility [6, 11, 12], the availability of the participants [13], the suppression of geographical distances and frontiers, the asynchrony (which permits to choose one's own tempo), the desinhibition effect of the anonymity [2, 13], etc. On the other hand, some drawbacks are mentioned: the necessity to have a computer linked to the Internet, the decontextualization of the communication which can favor misunderstanding, the question of the doubtful authority of the helpers.

We identify several gaps in these works: a methodological weakness when analyzing social support situations, a low conceptual level when defining social support, and a poor level of innovation when designing computer-based functions for assisting social support practices.

To be more precise, at the methodological level, we can notice that different situations are studied, but few references are made to existing social or psychological theories on social support. Results cannot thus have a general reach. Besides, analysis described in the literature are not fine-grained, nothing is done concerning patterns of interactions for instance. These researches identify general communicative patterns based on different methodologies like content analysis, interviews and questionnaires [10, 14]. However, little research studied these communication patterns in depth. Indeed, the study of online social support as a communicative event or a speech act is

rarely the main objective of researchers. Thus, the coding categories are global and heterogeneous. Finally, most of the works focus on the advantages that online social support provides, without any questions on the role of the internet medium on social support.

These methodological gaps are related to conceptual ones, related in particular to the definition of social support. In fact, as we showed in section 2.1, definitions which are used are very general, which lead to a total heterogeneity of the social support dimensions (linked to theories, observations, or even computer-based functions).

Finally, at an instrumental level, weaknesses can be pointed first at the design process which does not rely on an analysis of the social support activity. As we showed in section 2.2, this leads to very generic tools or to platforms where most of the innovations are focused on the interface. We did not find any functions strictly dedicated to at least one of the social support dimension.

3 MISS (Models of Internet for Social Support): An Interdisciplinary Approach

According to us, the only way to bypass the weaknesses of the existing studies listed in section 2.3 is to follow an interdisciplinary approach to: (1) analyze online social support activities, (2) model these activities, (3) define computer-based functions improving online social support. We intend to confront on one hand the observation of real online social support exchanges for instance on newsgroups (bottom-up approach), and on the other hand, the main theories related to social support (top-down approach).

We then propose a resolutely interdisciplinary process, as recommended by many researchers in social sciences in the field of CSCW [15].

Our process involves a sociologist, a psychologist, two linguists specialized in conversational analysis, and two researchers in computer science specialized in CSCW and HCI. It is divided into six steps:

1. *Functional description and use analysis* of existing forums dedicated to social support (see section 3.1).
2. Sampling several existing forums dedicated to social support and *analysis of these sequences of exchanges*. The results of this analysis permit to identify scripts or patterns of interaction (see section 3.2).
3. *Identification of social support conditions* with the help of social support theories in psychology and sociology. This step allows us to identify the necessary conditions for the successful outcome of a social support exchange (see section 3.3). Combining steps 2 and 3 allows us to define *communication contract(s)* for online social support.
4. Based on the communication contract(s) defined during step 3, *design of functions* favoring the respect of this contract (the conditions of success of a social support exchange).
5. *Implementation* of the functions designed during step 4 in a platform for emotional, informational and tangible support
6. *Evaluation:*

- *Usability test* to evaluate the relevance of the scripts
- *Use evaluation* in real settings; in our case, the platform will be used in a healthcare network dedicated to Alzheimer's disease. The aim is to provide assistance to friends and families of sick people.

3.1 Functional description and use analysis of existing forums dedicated to social support

As we described in 2.2., most of the solutions for online social support are based on forum software. Thus, in order to design dedicated solutions, it seems interesting to understand the functions these forums provide:

- The home page can display the parts of the forum in different ways: in a chronological order (usually based on the last post), in a logical way (just like in a thesaurus) or by popularity (number of posts or visitors).
- Each thread could be about: a topic, an actor, or a case (a link between an actor and a topic).
- Several features can be found to enrich the message: smileys, text formatting (color, bold, list items…), flags (to type posts or to give them states).
- Evaluation of actors, topics or posts can be done through polls, quantity (of posts…), abuse report, anteriority (register date, "low ID") and roles.

To illustrate these four items, an analysis of Doctissimo's forums emphasizes the fact that cases are the key concern of threads, and that users give more importance to visual effects (smileys, pictures, colours) in posts editing than in indenting and structuring formally their message. Evaluation is focused on members who can give their vote for each other and acquire reputation status through the quantity of message they have posted. No post or topic assessment by members' mechanism is provided.

To complement this "computer science oriented" analysis, we will interview some users of social support forums to know what they are seeking, to allow them to expose what they do and what they hope to do in the future. In other words, to borrow a well known expression in the field of work, we would try to highlight the "realness of activity" [16] in addition to the following description of activity due to the conversational approach (see section 3.2). It could be an original input to the design process. Those interviews could also help us to get an insight on the social dispositions (which are necessary to start the use of social support web sites) but even the career [17] of individuals[1] on these web sites.

[1] Explaining the strange phenomenon of anorexia, M. Darmon [18] shows us that it is a combination of social disposals in a bourdieusian viewpoint (it is mainly a high class female disease) and of an interactionist/ temporal process that H. Becker calls "career" [17].

3.2 Communicational and Interactional Patterns of Online Social Support

To overcome the methodological weaknesses we identified earlier for exchanges analysis (see section 2.3), our methodological proposition is a two-time analysis:

1. The first step consists in a conversational analysis of discursive exchanges of online social support. It concerns the sequential organisation of the exchanges and the pragmatics analysis of the messages. For example, the analysis of a sample of nine discussion threads of the Doctissimo forums shows the following results [19]:
   - The exchanges are made of three episodes: the initiative message (A makes a request), the reactive message (B provides support), and the evaluative message (or follow-up: A evaluates the message of B).
   - Each episode is composed of several specific speech acts. For example, a request for an emotional support is composed of greetings, description of the problem, formulation of the request, etc.
2. The second step consists in the definition of the scripts [20] which constitute the underlying patterns of the different types of social support exchanges.

3.3 Defining Efficient Social Support Exchanges by the Use of Psychological and Sociological Models

The studies of social support in psychology can be used to identify the favourable conditions for social support success, then to specify the features of socio-technical devices and to provide advices for their use (by defining the characteristics of the support group, or elaborating charters).

Four kinds of studies can be relevant, for instance:

- Studies focused on the achievement conditions of a request for support: a person who seems particularly not responsible of her distress situation is more likely to receive support [21].
- Studies about the achievement conditions of a support response: Burleson [22] showed the importance of the non evaluative dimension of a message to succeed in comforting someone.
- Studies on the psychological process explaining the benefits of social support: benefits of the explanation and re-evaluation of a distress experience [23].
- Studies on the nature of interpersonal relationships between people who are engaged in support exchanges.

There are no models or theories in sociology which can directly explain the online social support phenomenon. Moreover, as far as our state of the art leads us, we have not read analysis based on systematic inquiry of existing practices. Nevertheless, we can make use of peripheral and traditional concepts in sociology to better understand the phenomenon under study by making comparison. We consider it as a precondition of the instrumentation process. We think more precisely about the theory of gift [24],

the concept of solidarity [25][2] or more recently, the mutual help [27] which has monetary dimension within a family.

4 Analysis of an Example and Implications for Design: an Exchange of Experience Sharing in a Forum

These contributions can be clarified through the analysis of an example of experience sharing (taken from the French online forum Doctissimo), which permits to illustrate steps 2, 3 and 4 of the MISS method.

4.1. Conversational Analysis: Definition of a Script

The conversational analysis of sequences of experience sharing (which is a specific type of informational/emotional support) allows us to define a general script. More precisely, we identify the sequential structure and the speech acts which permit the achievement of a successful exchange (an exchange which is mutually ratified by the discussants). For an exchange, we observe the script described in table1.

Table 1. Analysis of an extract from the Doctissimo forum

n-joy2	Bonjour Tout le monde *Hello everybody*	Opening		Intitiative turn
	Je suis un homme de taille 190cm, je pèse actuellement 114Kg *I am a man, 1 meter 90 tall. My current weigh is 114 kg*	Description	Prerequest	
	J'ai totalement changé mon alimentation sans faire appel à un nutritioniste... et j'ai commencé à faire du sport.. principalement du jogging et de la bicyclette *I completely changed my diet without calling out a nutritionist… and I started doing sports… mainly jogging and bicycle*	Narrative		
	Je vous propose dans cette discussion de partager vos experiences avec moi, c'est plus facile quand on se sent en groupe et c'est moins dépriment *In this discussion, I propose sharing your experiences with me, it is easier when we feel we are in a group and it is less depressing*	Request Formulation		
	Bon courage ! *Good luck*	Closing		

[2] To refer to technical solidarity [26] which is about the body-with-body of humans and machines at work and the kind of links it products: Is the online social support a mediated solidarity?

Lilybaby 50	Bienvenu n-joy2 *Welcome n-joy2*	Opening		Reactive turn
	Je suis une femme qui aime trop le chocolat *I am a woman who likes chocolate too much*	Self-presentation	Experience sharing	
	Moi aussi j'ai 20kgs à perdre, je fais le yoyo aussi en règime et poids. *I have also 20kgs to lose; I do the yo-yo too in diet and weight.*	Description		
	Je commence sérieusement le règime le 4 Janvier après les fêtes *I will begin a serious diet from January 4th, after holidays*	Narrative		
	je te laisse bon courage et on se trvouve sur les posts... *I must leave you. Good luck and see you again in the posts*	Closing		
n-joy2	Bonjour Lilybaby50 *Hello Lilybaby50*	Opening		Evaluative turn
	Merci à toi pour ta réponse... *Thank you for your answer*	Thanks		
	je te suggère de ne pas attendre le 04 Janvier *I suggest not to wait until January 4th*	Advice		
	Bon courage à toi et mes meilleurs voeux pour l'année 2007 *Good luck and best wishes for 2007*	Closing		

By following this script, discussants respect *de facto* a communicative contract [28]: the communicative rules which have to be followed in order to achieve a social support exchange in a successful way. These rules are not strictly communicative. Indeed, a script guarantees the success of social support when it implements social and psychological felicity conditions.

4.2. The Use of Psychology and Sociology to Identify Felicity Conditions of the Script

According to studies of social support in psychology, the discourse of *A*, who makes the request, seems favourable for obtaining support for several reasons:

- One condition of receiving support is the act of doing a request [29]. *A* formulates the request in an explicit way and its intelligibility is probably enhanced by the prerequest.
- In the prerequest, the function of the narrative is important because it is an explanation about the strategy used to solve the problem and to ameliorate the situation. In fact, people who cope with a distress situation are more likely to obtain support [21]. There are two possible functions of this narrative. Firstly, information about coping strategy provides cues about needs and desires of the recipient (*A*). So, the provider (*B*) can easily understand the importance of bringing support to the person and what can be the "good" help. Secondly, it is a mean to signal to the provider the efforts made to resolve the problem. Consequently, the recipient shows himself as no (or less) responsible for the problem.

- Several utterances of *A* underline the importance of reciprocity in interpersonal relationships of people implied in support interactions. *A* displays the reciprocity by giving some kind of support in the closing of the request (greetings/wishes). He clearly gives support in the evaluative turn: advice and closing (greetings/wishes). It is consistent with studies showing that receiving support increases the likehood of support provision [30]. Reciprocity seems particularly important in the experience sharing but perhaps less in other kind of request as emotional support or tangible support.

The discourse of *B* illustrates the characteristics of an effective support response. The support provision of *B* is essentially a re-evaluation of the problem of *A* by the description of her own experience. The comparison with her experience (*I do the yo-yo too*) is an indicator of the normality of the problem of *A*. The other kind of support is emotional, displayed in closing (greetings/wishes).

In addition to the psychological reasons, four other arguments, freely extracted from the corpus of sociology, can explain the success of the experience sharing in the previous example:

- Firstly and very basically, there is neither social nor exchange opportunity if persons are not aware to be in relation to other people. This "reciprocity", used here in the sense of Simmel [31], is clearly signified in this experience sharing exchange.
- Secondly, the experience sharing is a success because it corresponds to the beginning of a gift-counter gift cycle [24], which is one of the conditions of social link building. As mentioned in the theory, this cycle not only refers to an instrumental dimension. Indeed, *A* shares her/his experience with people who received her/his messages by transmitting her/his own story, without trying to obtain specifically something (problem solving) and for her/his own need.
- Thirdly, this exchange is possible because of the structuring role of rituality in social life [32]. It concerns a linguistic dimension (opening/closing) but is also negotiated and is a source of discussion (B: "*I will begin a serious diet from January 4th, after holidays"*; A: "*I suggest not to wait until January 4th").*
- Finally, this exchange can take place because A and B are involved in a register of action called "familiarity regime" [33]. Each of them transforms the forum space in a personal space where they are at ease to discuss and to create complicity.

From these psycho-sociological reasons of the efficiency of the communicative contract that we have identified, we can now infer some features of an online social support system.

4.3 Implications for Design

Based on the data analysis, the defined scripts identify communication contracts which are efficient according to social and psychological felicity conditions. The platform we propose to design should foster the respect of these communication contracts and the satisfaction of social support exchanges success conditions. Several technical features can be envisioned to assist the different moments of social support exchanges.

Self-disclosure episodes, such as those presented in the prerequest sequences, are an important element, particularly in experience sharing. Emphasizing the narrative dimension, our platform could provide a private diary to each user where they can tell their problems in a more personalised way than with standardised form fields.

As described above, reciprocity contributes to successful social support exchanges. We can encourage reciprocity between users by offering alert features which help users to be easily up to date of new contributions. Contributors could keep a personal log about their problems, e.g. *n-joy2's diet log*, with which other users can follow the case evolution in subscribing to it, like RSS news feeds. Besides, by linking problems or pathologies tags on discussions and personal profiles, users would be able to find among all contributions the cases of interest and the newest ones. Tags and alerts provide the core structure for a powerful automatic matchmaking system which would increases opportunities of interaction, and so the reciprocity, between users who share interests and problems.

Keeping track of informational support exchanges would be helpful to allow users to easily retrieve useful information, practical advices and recommendations regarding their problems, e.g. about treatments and therapies. Users would be able to support this functionality by marking posts as *useful* according to the topic of interest defined by our tag system. Thus, people looking for such practical and helpful information concerning their problems could easily find it. They would not have to pass several hours browsing among all posts to find the famous 89th post at page 5 of the discussion "*Is it possible to lose 4 pounds in 24 hours?"* which contains useful advices about how to choose your nutritionist, as every regular contributor knows.

In classical forum systems, smileys are mostly standardized or brought from users' personal collection. It would be interesting to offer a dedicated set of smileys relative to social support, e.g. [:hug:], [:comfort:], [:metoo:]. Enriching and contextualizing smileys' emotional vocabulary would encourage and ease the emotional support.

Invitations such as *see you again on the posts*, incite to conceive threaded discussions as places where people are meeting around topics and manifest their presence by their contributions. In order to help users to meet again and be aware of each other, it would be interesting to present each topic with a gallery of avatars of users which have contributed to the discussion.

5 Discussion and Conclusion

To achieve this overview, we would pick out three points which underline the novelty of our approach:

The main originality of this approach lies in steps 3 and 4 of the process, where the mediation of the activity is taken into account. In fact, we distinguish the model of the social support activity and the model of the *mediated* social support activity. This distinction is quite unusual when designing computer-based system where designers often makes as if it was possible to define design principles of an artefact supporting an activity, directly from the descriptive model of the face-to face-activity. However, no one would deny that computer-mediation has an impact on the activity.

Moreover, the collaboration between social sciences disciplines (psychology, sociology, conversational analysis) and computer science takes place all along the analysis and design process, whereas this kind of collaboration is often limited to the upstream or the downstream of the process of design, for example with just a brief *a posteriori* experimentation of the tool, without really being involved in choosing or modifying the features.

However, this interdisciplinary process entails some risks. From the point of view of social and human sciences, which are descriptive, it could be very unfamiliar to be involved in a modelling and designing process which is more prescriptive. The second risk is related to the instrumentation process. In fact, as we illustrate in section 5, we make use of theoretical concepts (usually used to describe or to understand phenomena) in order to design a social support system. This transition from concepts to technical features has to be well-controlled so that the concepts keep being used in an appropriate way. Finally, there is a risk related to making use of concepts coming from different disciplines of social and human sciences in the same model. In other words, we have to attend to the compatibility of these concepts, which are furthermore not dedicated to the same level of analysis.

Nevertheless, if we manage these risks and overcome these difficulties, the MISS approach will permit both to make social sciences contributions guide the instrumentation of social practices, and explore theoretical questions in each discipline involved in the process. In the same time, social sciences can theoretically and empirically enrich the understanding of the role of a technical artefact in social practices by being involved in a design process.

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