Social Roles in an Online Support Community for Older People

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In this article, an online support community for older people is studied, with the aim of developing a taxonomy of social roles based on content analysis and social network analysis. Four hundred messages (posted between August 9, 2007, and February 5, 2008) in an online support community for older people (http://www.seniornet.org) were investigated. The data were analyzed to identify and shed light on patterns of the online functional behavior as well as the social structure of active members. Drawing on the findings, a set of six social roles were identified, defined, and described in depth. The findings showed that the structural positions of online community members were associated with the kind of content these members tended to post. For example, it was found that central members were very likely to give support, whereas members not very well connected were more inclined to post self-disclosing messages.

1. INTRODUCTION

1.1. Background

Shifting from the early focus on technical aspects of computer-mediated communication (Rheingold, 1993; Williams, 1982), researchers have begun to realize the impact of this technology on personal and social life (Chesebro & Bonsall, 1989; Garton, Haythornthwaite, & Wellman, 1997, Kiesler, Siegel, & McGuire, 1988; Lantz, 2003). One main area of interest in computer-mediated communication research has been the formation of online communities. Online communities are often defined as “webs of personal relationships” resulting from repeated public discussions in cyberspace (Rheingold, 1993). What drives the formation of these

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communities is a particular purpose (Preece & Maloney-Krichmar, 2005), or what Rheingold (1993) referred to as “collective goods.” These collective goods can be referred to as information, a sense of belonging, and the exchange of support (Herring, Job-Sluder, Scheckler, & Barab, 2002, p. 371; Rheingold, 1993).

A specific type of online community that has gained much interest in recent years is the online support community. The relative anonymity that people usually have in this type of community helps them talk about sensitive personal and emotional topics such as problems with their health or relationship issues (Beaudoin & Tao, 2008; Herring et al., 2002; Preece & Maloney-Krichmar 2003). It has also been noted that online support communities tend to have active and friendly members (Fisher, Smith, & Welser, 2006, Zaphiris & Sarwar, 2006).

The academic study of communities has traditionally been associated with the domain of sociology and social psychology, founded on theories such as social roles theory (Biddle, 1986; Markel, 1998; Merton, 1968; Zurcher, 1983). According to this theory, all forms of social behavior are an “expression of some social role” (Markel, 1998). Thereby, a social role is described as “the behaviour of status occupants oriented toward the patterned expectations of others” (Merton 1968, p. 41), or as Zurcher (1983) defined it, “the behaviour expected of individuals who occupy particular social categories” (p. 11). This means that people in any social situation will usually display a behavior believed to be expected of them.

We believe we can apply the principle of social roles when studying online support communities in order to understand predictable patterns of social behavior between different community members (Biddle, 1986; Cohen, Brissette, Skoner, & Doyle, 2000). These patterns, and the social roles derived from them, can then provide some insight into the interpersonal relationships found in online support communities. Several scholars (Brush, Wang, Turner, & Smith, 2005; Fiore, Tiernan, & Smith, 2002; Fisher et al., 2006; Golder, 2003; Herring et al., 2002; Turner & Fisher, 2006; Turner, Smith, Fisher, & Welser, 2005; Welser, Gleave, Fisher, & Smith, 2007) have examined roles in online communities, employing a plethora of different research methods like virtual ethnography, content analysis, and social network analysis.

Regarding the population that participates in such communities, Jones and Fox (2009) reported a large increase in computer usage among people older than the age of 60. As a matter of fact, research has shown a positive attitude toward computers, diminished social isolation, and increased life quality and self-confidence among older people who use computers for entertainment and communication purposes (Xie, 2003). Research into how older people use online communication tools (e.g., online communities) is thus essential (Hochheiser & Lazar, 2007). However, although online communities appear to be a valuable and potentially popular resource for older people, Xie (2003) highlighted the apparent lack of research studies in this particular area. We address this gap and investigate what social roles older people take on when interacting with each other in online support communities. Our findings can provide a more in-depth understanding of what elements help such communities to remain healthy and relevant to their members.

Our findings also complement other studies in the topic of online social roles and online social support by providing methods and ideas that could lead to
further research. Social roles are an essential part of social interaction, and they can help both explain and predict behavior (Biddle, 1986; Markel, 1998; Merton, 1968; Zurcher, 1983).

1.2. Aims and Objectives

The aim of this study was to investigate and scrutinize an online support community for older people in order to identify different social roles within the community. Our aim can be broken down into the following objectives:

1. To identify social roles based on members’ online posting behavior.
2. To identify social roles based on members’ social interaction and network structure.
3. To synthesize the findings to develop a taxonomy of social roles in online support communities.

To address these objectives, we applied two methods: content analysis and social network analysis. The combination of these methods resulted in a comprehensive taxonomy of social roles, encompassing the behavioral and structural aspects of social roles.

In this study, we studied a discussion group within SeniorNet (http://www.seniornet.org), an online community particularly aimed at older people. As our focus was on online support communities, we investigated a discussion group within the health section of SeniorNet. As there were a large number of discussion groups to choose from, we decided to investigate a community that was characterized by a high level of supportive interaction (informational as well as emotional). In addition, we made sure that the chosen online community was of a reasonable size, so that social roles could be observed as part of a larger online community. For privacy reasons, we cannot disclose the topic of the online community that we investigated, but it could be described by the following characteristics:

- It was an online community specifically aimed at people aged 60 and older, and thus we assumed that it was mostly older people participating in it.
- The topic of the discussion was health related and people utilized this online community to exchange experiences and support regarding this health condition. Both the exchange of informational as well as emotional support played a major role in the discussion.
- The online community was characterized by a reasonable level of activity. There was enough activity to observe regular patterns of communication and, at the same time, it was of a manageable size for people to recognize and know each other within the online community.

In the following, we first look at the definitions of social roles and various social roles theories. Also, we provide a synopsis of related research in online social roles. The Methodology section describes how our data were collected and analyzed. In
the Results section, key findings are presented and elaborated in depth, whereas
the implications of the findings in the context of social roles theory and other
research work are elucidated in the Discussion section. Finally, we conclude with
a summary of our findings and suggestions for future research directions in this
area.

2. LITERATURE REVIEW

The concept of social roles has long been a topic of discussion, and different
authors have proposed various definitions and approaches to study them (Biddle,
1986). Looking at the different definitions of the term, we note that researchers
often associate social roles with social statuses, social categories, or social parts
(Biddle, 1986; Markel, 1998; Merton, 1968; Zurcher, 1983). Furthermore, we also
observe that enactors of social roles adapt their behavior to suit both their own
preferences (Markel, 1998) and the expectations of others (Biddle, 1986; Merton,
1968). Thus, people expect certain behaviors, attitudes, and values from people
enacting specific social roles (Biddle, 1986; Markel, 1998; Merton, 1968; Zurcher,
1983).

In recent years, a great deal of interest in researching social roles in online
communities has emerged. Different authors have used different approaches or
techniques to model and explain social roles that are present in such communi-
ties. To create a typology of social roles in an online community, certain social
role theories seem more appropriate than others. To give an overview of different
approaches to research in this area, we briefly summarize two role theories that
are applicable and important for researching social roles in online communities:
functional role theory and structural role theory.

2.1. Functional Role Theory

The functional role theory focuses on the “characteristic behaviour of persons who
occupy social positions within a stable social system” (Biddle, 1986, p. 70). As the
name suggests, the theory is mainly concerned with the “function” of actors in
different positions, and it has been criticized for being rigid and not accounting
for the different personalities of people enacting the roles (Biddle, 1986). In their
studies, both Herring et al. (2002) and Golder (2003) adopted techniques suggest-
ing a functional role theory approach. In both cases, qualitative evaluation of the
types of content posted by online community members was used to distinguish
social roles. The focus of the studies was on the functions these members per-
formed and the effect they had on the community. These approaches were similar
in that they tried to group online community members based on their qualita-
tive behavior, the types of content they produced, or the part they performed in
a community. In their study, Herring et al. emphasized one particular social role:
troller. They describe a troller as a disruptive element in online communities who
tries to bait and provoke other group members with the aim of engaging others
in pointless arguments and diverting the focus away from the initial purpose of
the discussion (Herring et al., 2002). In their study, the researchers focused on one specific example of a troller in a feminist forum and developed a coding scheme based on the content that people posted in the thread. They then analyzed the provocative behavior of the troller and the responses generated from other members to propose explanations for these behavioral patterns as well as measures to prevent similar incidents (Herring et al., 2002).

Golder’s (2003) research had a different scope as he attempted to develop a typology of social roles in Usenet. To do this, he observed active members and grouped them, based on the assumption that observed behavior defines a member’s social role. He found and described seven roles: the newbie, the celebrity, the elder, the lurker, the flamer, the troll, and the rancer (Golder, 2003).

2.2. Structural Role Theory

The emphasis of the structural role theory is on members with certain social positions “who share the same, patterned behaviours (roles) that are directed towards other sets of persons in the structure” (Biddle, 1986, p.73). This approach analyses the system as a whole and looks at communication flows to explain the roles in a system.

Since the emergence of online social networks, we have seen several studies looking at social roles from a structural perspective, applying social network analysis (Fisher, 2005; Fisher et al., 2006; Garton et al., 1997). The social network analysis approach focuses on social interaction within a community to group members who display similar relational patterns to other members (Fisher et al., 2006; Hanneman & Riddle, 2005). Different groups are assumed to indicate different social positions. Although structural role theory has gained much popularity in online studies, it has been criticized for not trying to explain members’ behavior (Biddle, 1986, p. 73). Researchers adopting techniques reminiscent of structural role theory include Fisher (2005), Fisher et al., (2006), and Welser et al. (2007). They utilized techniques from social network analysis to distinguish between different social roles. In their studies, roles were not characterized by what type of content was shared by online community members but by the volume of content and the relations between members of the community.

Both Fisher (2005) and Welser et al. (2007) investigated social roles in Usenet by analyzing relational data. Using the Microsoft Netscan archive (http://web.archive.org/web/*/http://netscan.research.microsoft.com/), they generated egocentric networks (local social structures) around members of the newsgroups. From his findings, Fisher (2005) described four different roles: the answer person, the debater, the flamer, and the supporter. In another study, Fisher et al. (2006) used a similar technique to describe the characteristics of the social roles just mentioned. For example, they described the role of the supporter as a member who encourages new members to participate and keeps old members active through discussion (Fisher et al., 2006). Turner et al. (2005) attempted, similar to Golder (2003), to develop a typology of social roles in Usenet. Their approach was however somewhat different. They looked at the amount of messages per initiated thread and the days the thread was active. In addition, they compared
the number of initiated threads with the number of replies to existing threads for each member. They finally employed social network analysis visualizations to compare interaction patterns. Many of the roles they found bore a similarity to those of Fisher (2005).

2.3. Other Approaches

There have been a great variety of approaches used to study social roles online, and not all focused specifically on posting behavior or interaction patterns. Some authors examined different aspects of social roles, and some combined a number of techniques to collect and compare data. For example, Brush et al. (2005) collected data from a survey, usage log, and social accounting from Usenet participation to investigate user roles and differential usage of social metrics in Netscan\Tech. They defined five social roles: key contributors, low volume contributors, questioners, readers, and disengaged observers (Brush et al., 2005).

Although not examining social roles specifically, Pfeil and Zaphiris (2007) described two roles found in an online community for older people they studied. They applied content analysis to describe the roles of the empathizer and the target, defined by a tendency either to provide or to receive support in the community. They found that the rather passive members in the community were targets of support, whereas the more active members had a tendency to be empathizers (Pfeil & Zaphiris, 2007). Comparing Pfeil and Zaphiris’s empathizer role with Fisher’s (2005) supporter role, we found that both roles are characterized as providing support for less active members while maintaining a high level of activity themselves.

To identify the most appreciated patterns of behavior, Fiore et al. (2002) examined the perceived value of members and the members’ behavior in newsgroups. They found that members liked to read messages from others who posted frequently, posted useful messages, and strengthened group cohesion. In addition, popular members were those who replied frequently, replied to a large number of others, and had usually been active for a long time (Fiore et al., 2002).

2.4. Summary

To summarize, each social role has a set of expected behaviors and attitudes, and the functional role theory techniques define social roles through the characteristic behavior of actors. Furthermore, social roles can be directly related to social positions, as suggested by structural role theory, by associating actors’ structural positions with roles. In our study, we drew on both functional and structural role theory to identify social roles in an online support community for older people. After identifying roles based on behavior (the content that members posted to the community) and social structure (the relations that members had to each other) separately, we aimed to combine the findings from these two approaches to develop a comprehensive understanding of social roles in an online support community for older people.
3. METHODOLOGY

3.1. Data Gathering

We investigated SeniorNet (http://www.seniornet.org), an online community aimed particularly at older people. The title of the specific discussion board chosen for analysis is not disclosed to protect the privacy of its contributors, but it had a clearly stated aim of exchanging support and was found under the “Health” section of SeniorNet. Online communities under this section were categorized into specific health issues (e.g., back pain, arthritis, etc.), and the purpose of these online communities was to exchange information and emotional support in order to help each other to deal with the illness. People suffering from this illness in various levels of severity came together to talk about their experiences and their successes and failures in treating it. Generally, they wanted to support each other in living with it. Often, people were very well informed about the situations of other members and were thus ready to offer personalized help and suggestions to each other.

In the investigated discussion board, posts were not sorted into subthreads but organized in chronological order. The discussion board was created in August 2007, and we analyzed the first 400 messages in the thread, covering messages posted between August 9, 2007, and February 5, 2008. MAXqda2 (VERBI Software, Berlin, Germany) was used to assist data management and analysis. This software allows organizing pieces of texts into a hierarchical system, adding or developing a coding scheme, coding messages, and retrieving chunks of messages based on certain attributes.

Our objective was to investigate social roles from both a functional perspective (focusing on the content that members post) and a structural perspective (focusing on the relations between members). These two aspects were analyzed separately before we combined and synthesized the results. Thus, in the following, we describe our procedure separately for the content analysis (functional perspective) and social network analysis (structural perspective).

Ethical considerations. It is generally agreed that consent is not required for every research project, as the distinction whether the data collected are private or public has a great influence on determining whether consent is required or not (Eysenbach & Till, 2001; Frankel & Siang, 1999). If the setting of data collection is considered private, informed consent needs to be obtained; however, if the setting is regarded as public, informed consent is often not required. At the time of data collection (summer 2008), the content of SeniorNet was publicly available to all Internet users (no registration was required to access all the messages). Therefore, it can be argued that people interacting in such an open online forum and “chats” can be subject to scientific study without their consent (Garton et al., 1997).

Nonetheless, ethical consideration was carefully taken into account when carrying out this study, as we were dealing with vulnerable users. Specifically, the usernames of the members were not revealed in the study and quotation of messages was avoided. Our main focus was to identify the network structure and
content category rather than the content itself. By focusing on roles as the categorization of users’ behavior and structural positions, we analyzed our data independently from the person who sent the message. It was impossible to identify the users’ identity, and their anonymity was thus strictly protected.

3.2. Content Analysis

Data preparation. When analyzing the content of the messages, we took the first step of developing a coding scheme. We read the contributions thoroughly to get ourselves familiar with the community and to understand the context in which the communications took place. Then, drawing on and contrasting against Pfeil and Zaphiris’s (2007) scheme, we went through the messages again, making notes about reoccurring themes and key topics of the messages. Using MAXqda2, temporary codes were created and notes were made on existing codes. This procedure was iterative and continued until saturation was reached and a coding scheme that covered all content exchanged in the discussion board was developed. In total, the coding scheme consisted of 11 codes grouped into five main categories. Table 1 explains the coding scheme in detail.

After the development of the coding scheme, all 400 messages were coded. Consecutive sentences within one message that share the same meaning were taken as one unit of analysis to ensure that the coding captured the necessary detail, whereas the data were analyzed in its context. This means that one message could consist of several units of analysis, each of which was coded into one of the codes. To test for intercoder reliability, a second coder was asked to code a subset of 11 messages. Comparing the coded messages of the main researcher and the second coder resulted in a Cohen’s kappa coefficient of 0.69, which was considered to be satisfactory (Neuendorf, 2002).

Data analysis. After the data were coded, we calculated the level of activity of each member according to the number of words and the number of posts that each member wrote. Based on our coding scheme, we also investigated the content that individual members posted. For each member, we calculated the percentage of words coded into each of the codes of the coding scheme. These measures were taken as a basis to look for recurring patterns that would allow us to group members according to their behavior.

3.3. Social Network Analysis

Data preparation. For social network analysis, the data we collected were the interactional structure of conversations—in other words, who replied to whom. The layout of the discussion board did not feature a formal means for identifying to whom the message was addressed, as the thread was a continuous discussion with intertwined replies on various topics. The lack of a formal reply feature meant that data collected for the social network analysis required manual examination.
Table 1: The Final Coding Scheme Used for Content Analysis

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-disclosure</td>
<td>The content is about the poster. It is not about the community and not about</td>
<td>I feel lonely</td>
</tr>
<tr>
<td></td>
<td>providing support.</td>
<td>The feeling is overbearing</td>
</tr>
<tr>
<td>Personal feeling/thought</td>
<td>Personal feeling, opinion, or thought on a topic. Can be an agreement or</td>
<td>I went outside and did some yard work</td>
</tr>
<tr>
<td></td>
<td>disagreement to a previous comment.</td>
<td>I’m going to read up on this</td>
</tr>
<tr>
<td>Personal situation/story</td>
<td>Content about the posters activities outside the community. Personal, but</td>
<td></td>
</tr>
<tr>
<td></td>
<td>factual, and mainly nonemotional in its form. Often in past tense, and often</td>
<td></td>
</tr>
<tr>
<td></td>
<td>narrative.</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>Content that refers to the community itself (SeniorNet or the discussion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>thread), or posts or activities within the community</td>
<td></td>
</tr>
<tr>
<td>Own activity</td>
<td>Content referring to the poster’s own activity within the group.</td>
<td>Will write more later</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will be back soon</td>
</tr>
<tr>
<td>Thanks/appreciation/best</td>
<td>Content that displays appreciation, thankfulness, or best wishes for the</td>
<td>Thank you for your post</td>
</tr>
<tr>
<td>wishes</td>
<td>group members.</td>
<td>Have a good evening</td>
</tr>
<tr>
<td>Discussion/activities</td>
<td>Content about discussion, community activity, or the posting behavior of</td>
<td>What do you do when you feel this way?</td>
</tr>
<tr>
<td></td>
<td>other members. Often encouraging or starting discussions by asking open</td>
<td>How do you deal with pain?</td>
</tr>
<tr>
<td></td>
<td>questions.</td>
<td></td>
</tr>
<tr>
<td>Welcome/recruitment</td>
<td>Content that welcomes newcomers, invites others, or encourages others to</td>
<td>Thanks for dropping by</td>
</tr>
<tr>
<td></td>
<td>invite others to join the community.</td>
<td>Welcome to our group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>. . . please tell him to join</td>
</tr>
<tr>
<td>Factual</td>
<td>Content presented in a factual, nonpersonal, tone. Can be either technical</td>
<td>If you click on the numbers you can jump between pages</td>
</tr>
<tr>
<td></td>
<td>information or information on the topic of the discussion thread.</td>
<td>It was caused by CFS</td>
</tr>
<tr>
<td>Technical issue</td>
<td>Technical information about the discussion forum, the SeniorNet website,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internet, software, or computers.</td>
<td></td>
</tr>
<tr>
<td>Factual information</td>
<td>Content that contains explanations, or topic-related information. Presented</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in an objective, nonpersonal way.</td>
<td></td>
</tr>
<tr>
<td>Slightly off</td>
<td>Content that is unrelated to the poster, the community, or the topic of</td>
<td>*I hope you get better soon</td>
</tr>
<tr>
<td></td>
<td>discussion in the community.</td>
<td>*You really had it tough, you’re a very strong person</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

To decide whether the message was a reply to another member’s message. We considered a message to be a reply when the members addressed each other by different means, such as stating another member’s forum username, quoting texts from the other message, or expanding on a topic initiated by the other member.
For each message, we captured the member who posted it, when it was posted, and to whom the message was sent. To test for intercoder reliability, two independent coders coded the sender and recipient(s) for 11 messages and reached an agreement of 92%, which was considered to be satisfactory.

After the social network analysis data had been prepared, we formatted them so that they were suitable to be inserted into the social network analysis tool UCINET 6 (Borgatti, Everett, & Freeman, 2002).

**Data analysis.** To study the structural position of our online community members, we analyzed the equivalence of the social network. Equivalence in this context refers to similarity in the members’ relationships or communication patterns toward other members. When investigating the equivalence of members of a network, we think of them not as individual persons but as entities of a category (role). Thereby, members who are similar are grouped into one role. Thus, social roles are identified by investigating similarities in the social relations that members have with each other. (Hanneman & Riddle, 2005). One of the most common types of equivalence for identifying social roles is regular equivalence (Hanneman & Riddle, 2005). Hanneman and Riddle (2005) described regular equivalence as follows: “Two nodes are said to be regularly equivalent if they have the same profile of ties with members of other sets of actors that are also regularly equivalent.” For example, two mothers are regular equivalent because they have similar ties with their child(ren), husbands, and so on. They are similar because they have the same relationship with members from other roles (Hanneman & Riddle, 2005).

There are different ways for investigating the regular equivalence of members of a network, and the social network analysis tool UCINET offers various algorithms. We chose to apply the Continuous REGE (REGular Equivalence) algorithm, which according to Hanneman and Riddle (2005) is appropriate for directed, valued networks. Continuous REGE uses the iterative REGE algorithm to look for regular equivalence in the tie between two members (Borgatti et al., 2002; Hanneman & Riddle, 2005). In the first iteration, the algorithm distinguishes between members who send messages, send and retrieve messages, and only retrieve messages. In the second iteration, the reach of the algorithm is increased by one (not only looking at immediate “friends” but also “friends of friends”). Two members are considered similar if they have links to members who themselves were found to be similar in the first iteration. Thereby, the strength of links is also considered. With each further iteration, the reach is increased by one. For our study, we chose the default value of three iterations.

The output from the approach is a symmetrical matrix with the list of members on the row and the column. The value in each cell represents the level of equivalence between two members. The matrix is symmetrical and shows the regular equivalence between pairs of members on a scale from 0 to 100. Thereby, 0 indicates that no ties to other groups are shared between two members, and 100 means that all ties to other groups are shared between them. The symmetrical matrix displays the regular equivalence between all pairs of members.
4. RESULTS

In this section, we present the results of our analyses. We start by looking at the findings from the content analysis, followed by the results of social network analysis.

4.1. Content Analysis

**Volume of content posted by actors.** For each member, we examined the number of words and the number of messages posted. In total 35,937 words were posted, and the mean number of words per member was 1,239. The median number of coded words however was only 731. The member with the highest volume of words (Member 4) posted 10,911 words, and the least active (Member 15) contributed only eight words. We observe a similar trend when examining the number of messages posted by each member. Again the member with the largest number of messages was Member 4 with 102 messages. The members with the least number of messages were Members 1, 6, 15, 23, and 29, who posted only once. The mean number of messages per member in the sample was 14, whereas the median number of messages was nine. Figure 1 shows the percentage of words and messages for each member.

**The distribution of content.** An important aspect of the data analysis with regards to distinguishing social roles was the distribution of codes for each

![Figure 1](image.png)
individual member. First we investigated the distribution of the codes for each member separately and plotted this distribution in a graph. However, it was difficult to analyze these results as, for example, the category **Self-disclosure** was a very dominant part, whereas types of content, such as **Welcome/recruitment**, were much less frequent. This made it difficult to compare the categories, as the smaller values became next to invisible in a graph. To address this, we looked at the difference in percentage between the member’s percentile distribution and the average percentile distribution among all members for each category. This helped us emphasize categories that distinguish certain members from others and deemphasizes categories that are similar among many members. The results are shown in Figure 2. Each value has a color code to indicate the difference from the average: significantly above average (higher than 150%; black), around average (50%–149%; dark gray), significantly below average (lower than 50%; light gray), and no content (0%; white). After that, we aimed to group the members into groups that share similar contents of messages that they posted. The important factor when grouping members was to look for patterns. The members were grouped to maximize the overall consistency within each group, so that the internal differences were judged against the internal similarities. A separate table with the groups’ average values is shown underneath in Figure 2.

In Figure 2, each member was given a value for each category of content. This value indicated the difference in percentages between the member’s percentile distribution (the percentage of the coded words for this member in the specific category) and the average percentile distribution among all members for the category. Beneath we see an overview of the different groups and their average values. Because the number of actors in each group was unequal, the average between the groups in each category varied also.

This content analysis produced seven types of social roles in the online community we examined. In the following, we go through each group and discuss the types of content that the members posted in the discussion group.

**Group A.** Members in Group A had an average level of activity in self-disclosure but provided twice as much support as the average actor. The members in Group A also wrote less than average about their own activities and posted slightly more than average content in the categories **thanking others** and **discussing activities of the community**. The main characteristic of this group is that they were the only group engaged in welcoming new members to the community. This could suggest that these members had a stronger feeling of responsibility and belongingness toward the community and would like to see it prosper. The members in Group A were not very active in talking about factual topics, or about people outside the community, but they were the most likely to discuss off-topic issues.

**Group B.** The members in Group B were in many ways similar to the members of Group A. They posted similar number of messages in all categories as Group A except for the category **discussion/community activities**, where they contributed less actively; the category **welcome/recruitment**, where they contributed nothing at all; and the category **third-person story**, where they
FIGURE 2  Grouping of members based on posted content.
contributed substantially more than members of Group A. Lower level of activity on discussion and welcoming new members could imply that members in Group B did not feel as involved in the community as the members in Group A. Furthermore, a higher contribution in the category *third-person story* shows that they tended to shift the focus from other members of the online support community to outsiders who were not taking part in the communication.

**Group C.** Members in Group C focused mainly on activities in the category *community*, although no message was posted to welcome new members. Another main characteristic of this group was its active participation in technical issues, suggesting that their main interest was not to help other members by providing emotional support but rather by sharing their expertise in technology.

**Group D.** Group D was not a uniform group, but it consisted of actors with low volumes of messages and peculiar code distributions. One member was interested only in factual information, whereas the other two wrote only about their own activity in the community and about the discussion/activities of others. The characteristic of this group was rather arbitrary, making it difficult to identify their social role.

**Group E.** Members in Group E had a much higher than average percentage in messages posted in the category *personal feeling*, whereas they contributed to an average number of messages about their personal situation. Furthermore, they mainly ignored all other types of activities except for the category *factual information*.

**Group F.** Except for a few categories, members in Group F seemed to be the most average users. They contributed averagely in the categories *self-disclosure* and *support*. When it came to community-related messages, they posted almost next to nothing about their own activity, and like most groups, they did not post messages to welcome new members. Half of the members in this group provided a lot of factual information, and all members had a large percentage of messages in the category *third-person story* category. In many respects, Group F was very similar to Group B. They both talked about themselves, they both provided support moderately, and they both talked a lot about people outside the community. However, members in Group F had less focus on support and community and more focus on factual information.

**Group G.** Group G was in many ways similar to Group E. However, whereas members in Group E posted a lot about personal feelings, members in Group G mainly described their personal situation. As Table 1 shows, personal situation contains nonemotional information about the poster. This suggested that members
in Group G explained their personal issues in nonemotional terms and possibly attempted to receive emotional support without posting messages about their own feelings. Neither group provided any support, nor did they post any message about the community. Members in Group G also talked about third persons quite frequently.

4.2. Social Network Analysis

In this section, we present the results of social network analysis. We investigated the regular equivalence of members and grouped them based on their similarity of relationship patterns. The results from the REGE analysis are presented in a matrix that displays the approximate pairwise regular similarities between 0 (totally dissimilar) and 100 (identical). The values were color-coded in intervals of 10 (0–9, 10–19, etc.) where the color was gradually darkened from white and different intensities of gray to black. As we can see in Figure 3, Members 15 and 23 had identical ties to other groups. Other pairs of members with relatively high regular equivalence were 9 and 10, 17 and 22, 5 and 13, and 3 and 7. We can easily see the different clusters of members with similar regular equivalence. To group the members based on their regular equivalence shown in the matrix (see Figure 3), we grouped the pairs that had the most similarity with each other and then continued this process until the members had already been placed in another group (because they were more similar to the core actors of that group) or they did not have at least 50% similarity with the core members. Based on this analysis, six groups displayed underneath the matrix emerged from REGE analysis.

In Figure 3, each member indicated by its number had a symmetrical regular equivalence value with each other member ranging from 0 (totally dissimilar) to 100 (identical). The groups of members with the highest values were used as group cores, and other members were added to the core that had core members to whom they had the most similarity. Members with a smaller average value toward both core members than 50 were left ungrouped. These members were shown beneath the main matrix.

To investigate the communication activities between members of the six identified groups, we rearranged our adjacency matrix that indicates the communication between members so that members who were in one group are displayed next to each other. The results are shown in Figure 4. As this figure shows, there are different patterns of communication for each of our six identified groups.

Overall, six groups were found, and five members did not fit into any group. In the following, we look at the characteristics of the different groups and how members within these groups communicated with each other.

**Group A.** Members in Group A hardly communicated with any other groups. What is evident about Group A is that the members were not well connected. They sent only a few messages to the most central members in Group C. The low number of messages could suggest that members in Group A were only visiting the online support community and not being regular participants in it.
FIGURE 3   Groups based on regular structural equivalence.

**Group B.** Group B was the largest group, and the members in this group interacted fairly often with each other and actors in Group D, but most messages were directed toward the members in Group C. In addition, Group B received messages from members in Group F. Group B interacted with more groups than Group A did, although these communications were mostly infrequent and short.

**Group C.** Group C was the most active group and consisted of four members. These members had a lot of contact with Group B and communicated with
Groups A, E, and D. A notable absence was the message directed from Group C to members in Group F, or to any of the external members. All other groups except for Group D sent messages to members in Group C. The high level of activity and the central position of members in Group C enabled it to function like a hub in the community. For most members, a large part of their communication took place with members in this group.

**Group D.** Group D consisted of two members. The messages of these members were mainly directed to members in Group B. Members in both Group B and C posted replies to Group D. This group shared similarity with Group A in that
they were fairly disconnected from the community. The fact that they did not reply to Group C (although they received relatively long messages from members of this group) suggested that they came to the online community mainly to ask questions or trigger support from other members, as they sent few and short messages and received more and longer messages.

**Group E.** Group E’s posting was mainly directed to Group C. This group also maintained reciprocal relationships with Groups B and C. Aside from this, Group E was fairly disconnected.

**Group F.** Group F was also a small group, and the members posted messages to members in Groups A, B, C, and F. They received no message at all, however, from other groups. The characteristic of Group F was that although they did send out messages to members in three other groups, no members in these groups replied to them. As an example, the messages could provide answers for others, or they could present information of little interest to others. In any case, Group F did not seem to be strongly related to the community, along with the ungrouped members.

**Communication patterns between groups.** Figure 5 summarizes the interaction patterns between groups identified through regular equivalence and the strength of interaction based on the number of words of messages written by actors in the respective groups.

### 5. DISCUSSION

From the behavioral and structural analysis, we can clearly observe the distinct communication patterns between the members in the online support community.
Members were grouped according to their regular equivalence, and we also identified different groups based on the content of the messages they posted. In this section, we discuss how the findings from our content analysis and social network analysis can be used to develop a taxonomy of social roles based on the behavior and structural position of the members. We combined the two sets of findings to develop a unified typology of the social roles in the support community. At first glance, it appears that there is no overt connection between the results of the structural approach (social network analysis) and the behavioral approach (content analysis). The groups identified by the two approaches contain different members. However, at closer look, some relationships can be found. In our discussion, we present a synthesis of the results from our content and social network analysis and describe the roles we found.

5.1. Moderating Supporter

Members 3 and 4 in the investigated online support community played a social role, which we call *moderating supporter*. These members were found in behavioral group A, which means they posted an average amount of self-disclosure and a large amount of support-related content. This indicates that they both gave and received support. A defining feature of this social role is that they generally had a strong interest in the community, evidenced by the fact that they tended to post a large number of words associated with welcoming and recruiting new members. Another feature of this role is that they put a lot of effort into playing their role in the community. They were frequent posters and the central figures in the community as they belonged to structural group C. Based on this, we can conclude that the moderating supporters were the backbone of the support community. They were the central figures who tried to strengthen the community by getting new members to join in to share their thoughts and problems. They gave and received support, and they chatted about issues unrelated to the topic (off topic) of the thread. This role is similar to the *manager* role defined by Turner and Fisher (2006), as people in this role take responsibility for the well-being of others and the maintenance of the community. Moreover, due to the large number of messages that members in this role posted, it has similarities with the role described by Brush et al. (2005) as *key contributor* to the community.

5.2. Central Supporter

Members 2, 7, 8, 9, 11, 12, 24, and 27 were found to play the social role of *central supporter* in the community. These members were placed in behavioral groups A and B, which we explained earlier, and engaged moderately in self-disclosure and actively in giving support. Some members in this role posted content welcoming new members, whereas others chatted about third persons and off-topic issues. With the exception of one member, the central supporters were regular or frequent posters. They were also fairly central in the community, with most members classified in either structural groups B or C. The central supporter role played
an important part in the community in giving and receiving support, similar to that of moderating supporter, although central supporters were less active and less concerned about activities within the online support community that would strengthen the community feeling. Due to the amount of support given but the inhibition to post welcoming messages, this role has some commonalities with Turner and Fisher’s (2006) mentor role. A mentor is defined as an active participant who influences the community and helps other members (Turner & Fisher, 2006). According to Fiore et al. (2002), the attributes of the central supporter also suggest that members in this role are valued and trusted by other members. In addition, because central supporters replied to both connected and more disconnected actors, they fitted the supporter role defined by Fisher (2005).

5.3. Active Member

Members 5, 13, and 22 were thought to play the role of active members in the support community. These members were all grouped in behavioral group F, meaning that they posted an average amount of content related to both self-disclosure and support. They were also interested in community issues and posted factual information and information about third persons. The members were fairly central in the community, being categorized in structural group B. All the members were regular posters in the community. The active members in the support community consisted of members who chatted mainly about themselves, their thoughts, and their personal situation. They also provided support to other members. Both contributions of support and factual information imply that the group shares similarities with Turner and Fisher’s (2006) mentor role, which is associated with activity and influence in the community and with helping other members. In addition, the debater role defined by Fisher (2005) also shares some of the features of this role, as debaters are defined by being well connected and “replying to people who are themselves well connected.”

5.4. Passive Member

Members 14, 16, 26, and 29 were identified as the passive members in the support community. These members were categorized in behavioral groups E and G. They participated actively in self-disclosure but not support. Moreover, they did not post much community-related content. Apart from these, they posted factual information and third-persons stories. Structurally the passive members were not very central in the community. The passive members in the support community were made up of the typical targets as defined by Pfeil and Zaphiris (2007). They did not interact much with other members but tended to write about themselves, their situation, and the situation of the people they knew. This type of content triggered replies from the active members and supporters in the community that provided passive members with support. This role shows similarities to Turner et al.’s (2005) questioner role, which manifests by few and short messages sent but more and longer messages received. Apart from these, due to the low volume of posted messages, passive members also exhibit similarities to Brush et al.’s
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low volume contributors, defined as users who visit the online community less frequently and often prefer reading rather than writing messages.

5.5. Technical Expert

Members 10, 17, 18, 20, 21, and 23 were found to play the role of technical expert. These members were all in behavioural group C. They generated less than average amounts of content on self-disclosure, indicating that they were not very interested in receiving support. They did, however, express a lot of interest in the community and put a large share of their effort showing their thanks and appreciation to other members’ posts. The defining feature of this group was the amount of content related to technical issues. Although the members in this role were fairly central, as being categorized in structural groups B (three actors), A, D, and E (one actor each), they were not very frequent posters, and their messages were generally low in volume. This supports the idea that these members provided predominantly short messages on technical advice rather than provide or receive support (which tended to consist of more lengthy messages). The technical experts in a support community did not post very often but tended to help anyone who struggled with problems related to the Internet or computers in general. They were polite and formal but had little interest in the actual topic of the community. The emphasis on the community itself and helping with technical issues implies that the role of the technical expert is similar to the manager role described by Turner and Fisher (2006).

5.6. Visitor

Members 1, 6, and 15 were found to be enacting the role of visitors in the support community. The members in this role were all found in the rather diverse behavioral group D. Some members simply told the community what they were doing there, whereas others expressed their opinions about the community and provided factual content. Structurally, these members posted only a few messages and had very remote positions in the community. The members were categorized in structural group A, except for Member 1, who did not reply to or receive any messages from anyone. The role of visitor in a support community was a strange one, as it did not seem to have any expectations associated with it. Rather it was defined by the lack of such. They could however fit Turner and Fisher’s (2006) member role, as they do post in the community. The low volume, however, means that they could be categorized as readers, or disengaged observers by Brush et al.’s (2005) definition.

6. CONCLUSIONS

Based on the findings from this study, some recommendations can be drawn, which may help practitioners to maintain or develop online support communities for older people. We would like to highlight four issues that may be of practical use:
Understanding different types of users and designing to support their needs.

The level of activity can be an indicator of supporters in the community.

Maintaining a number of central and immersed actors can be critical to the success of a support community.

Encouraging passive members to participate more actively.

First and most important, the taxonomy of roles based on network structure and behavior can provide an in-depth understanding for developers as to how various types of users interact with each other and the patterns of their message posting behavior. This way, we can design a system that can facilitate and support the needs of all users.

Second, a critical factor of successful support communities is the extent to which members are active at providing each other with support. Our finding on the moderating and central supporter role shows that while being the most active members, they were also the most frequent posters. Although not surprising, this suggests that the number of frequent posters in an online support community could be an indicator of the community’s effectiveness in terms of providing support. If posting frequency data could be collected from the online support community, these data could then be used to alert administrators of possible problems if too few frequent posters were present.

Third, incentives could be used to get members to be more involved in the discussions, potentially motivating more them to take on a supporting role. Such incentives could, for example, give frequent and important supporters official statuses in the community. This could confirm the role they have taken and make their importance to the community evident both for themselves and others. Another measure could be to make users feel comfortable posting about their personal issues. Design guidelines that improve trust (often used in some websites involving monetary transactions), for instance, can be very beneficial because a greater number of people posting about themselves could influence more members to take on a supporting role. Furthermore, we can conclude from our structural data analysis that a small number of members served to connect a large number of other members in the online support community. These few members were extremely important in maintaining the healthy growth of the community. Practitioners should find ways to identify members who tend to reply to a large number of other members and to reveal these members who play a central role in the community. Such data could be used to evaluate the stability of the community.

Fourth, a key difference between passive and active members, as shown by our finding, is that active members engaged in both self-disclosure and giving support, whereas passive members mainly posted only self-disclosure messages. Previous research has shown that it is more likely for someone to give support to those who experience similar situations (Pfeil & Zaphiris, 2007). Therefore, if we can help identify similar users based on their structural positions and content, we might be able to encourage more active participation in giving support thus increasing the posting frequency.

The study of online social roles through the use of both content analysis and social network analysis provides an interesting insight into the communication
patterns of the online community. Traditional research focusing on the content overlooks the important structural information of the community, whereas studies focusing on the structure alone tend to neglect the context in which interaction takes place. It is therefore an interesting area for further studies to further validate the findings presented here and to test the methods in a different context of other communities.

One of the limitations of the study is the absence of users’ perception data. This could be interesting because expectations for behavior, both actual and perceived, are an essential part of social roles (Biddle, 1986; Markel, 1998; Merton, 1968; Zurcher, 1983). For instance, an approach used by Turner and Fisher (2006) and Fiore et al. (2002) was to ask participants about their impression of their own or others’ social behavior. Thus, it could also be useful to combine different approaches to looking at online support communities for older people such as the use of questionnaire and interview methods to complement behavioral data.

Another limitation lies in the fact that online activities constitute perhaps only a small part of the older users’ overall social life. Their offline social network might have a significant impact on online role construction and enactment and vice versa. Hence, another exciting topic is the differences in role enactment in online and offline support communities. The presence of anonymity in online support communities has been argued to encourage people to share more about themselves in the online setting (Beaudoin & Tao, 2008, p. 325; Preece & Maloney-Krichmar, 2003). It would be interesting to examine other interaction mechanisms used offline and how they are translated into the online environment.

Finally, the purpose of this study was not to compare online support communities for older people with equivalent communities in offline settings or online support communities for other target populations (e.g., younger people). Instead, we aimed to produce a thick, rich, and comprehensive description of roles in such an online support community. Indeed, the focus of the study lies on its characterization and understanding rather than on the distinction in comparison to other online (support) communities. The scope of our research was defined by the kind of online community (online support community) and the target population (older people). To investigate to what extent our findings are generalizable, future research can build on our findings for comparisons of different online communities.

REFERENCES


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