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# Gender and Role Differences in Family-Based Healthy Living Networks

**Stephen Kimani**

CSIRO Tasmanian ICT Centre  
GPO Box 1538, Hobart, 7001,  
Australia  
Stephen.Kimani@csiro.au

**Nilufar Baghaei**

CSIRO Tasmanian ICT Centre  
GPO Box 1538, Hobart, 7001,  
Australia  
Nilufar.Baghaei@csiro.au

**Jill Freyne**

CSIRO Tasmanian ICT Centre  
GPO Box 1538, Hobart, 7001,  
Australia  
Jill.Freyne@csiro.au

**Shlomo Berkovsky**

CSIRO Tasmanian ICT Centre  
GPO Box 1538, Hobart, 7001,  
Australia  
Shlomo.Berkovsky@csiro.au

**Dipak Bhandari**

CSIRO Tasmanian ICT Centre  
GPO Box 1538, Hobart, 7001,  
Australia  
Dipak.Bhandari@csiro.au

**Greg Smith**

CSIRO Tasmanian ICT Centre  
GPO Box 1538, Hobart, 7001,  
Australia  
Gregory.Smith@csiro.au

**Abstract**

We have recently witnessed a tremendous increase in popularity and growth of online social networks. Social support and family involvement can play an important supportive role in health management. An increasing number of family members are establishing online social networking relationships with their families. This trend poses new research questions on effectively accommodating family members in online social networks. Family members themselves often have very different requirements based on their gender and family role. There is little research on the design of family-oriented social networking applications. In order to fill this research gap and investigate the impact of social and family relationships in online social networks, we are developing a healthy living online social application to support families in adopting healthy lifestyles. This paper reports the findings of a user study aimed at understanding gender- and role-based characteristics and differences in family-based healthy living social networks. The study shows that female users play a major role in leading the usage of the social technology; parents remain conscious of and concerned about their family's health as they interact with the social technology; and the social technology should support fun, especially for children.

**Keywords**

Online social networks, gender, role, families, healthy living, user interaction, user requirements

**ACM Classification Keywords**

H.5.2 User Interfaces: Evaluation/methodology, User-centered design.

**General Terms**

Design, Experimentation, Human Factors

**Introduction**

Chronic conditions have become one of the chief causes of death globally [20]. There is a correlation between social relationships and health [3]. This is an interesting correlation considering the increased popularity and growth of online social networking. From December 2007 to December 2008, two-thirds of the world's Internet population visited a social network or blogging site. The sector accounted for nearly 10% of all Internet time and surpassed personal email in popularity [14]. Consequently various studies have been conducted to understand systematic differences in adoption and usage with respect to specific social networking sites, specific, and demographics of users. Joinson [11] found that women visit Facebook more frequently than men. Tufekci [19] reported that the odds of a woman using social networks were four to five times that of a man. However, Lenhart [13] found that Facebook and LinkedIn users were more likely to be male. Thelwall [18] analyzed online social networking friendships and reported that females tend to be more interested in friendship and males in dating.

Family plays a fundamental role in the health of individuals, and healthcare could be improved by

strengthening the family's role in health promotion [6]. It is worth noting that an increasing number of family members, not just friends and co-workers, are establishing online relationships and communicating via online social networks [12][2]. This new medium of communication within a family poses new research questions on effectively accommodating family members in online social networks. Family members themselves often have very different requirements based on their gender and family role.

Most of the existing works on user gender and role in online social networks (e.g., [11][19][13][18]) have not considered the family context. An interesting effort is [8], which reports that parents feel compelled to share their health information with family members as an expression of care, openness, and behavior modeling. The work goes on to indicate that parents would like to have children protected from negative consequences of accessing the information. There are also studies in ubiquitous computing that provide guidelines on the facilitation of domestic communication and interactions (e.g., [5][1]). Existing literature therefore provides little information on the design of family-oriented social networking applications for healthy living. In order to fill this research gap and investigate the impact of family relationships in health based online social networks, we are developing a healthy living online social application, named SOFA (*S*ocial *F*amily), to support families in adopting healthy lifestyle.

In this paper, we describe the first phase of a user study aimed at understanding gender- and role-based characteristics and differences in family-based healthy living online social networks.



**Figure 1.** SOFA homepage.

The study was done using SOFA. The results showed that: 1) Females play a major role in leading the adoption and usage of the healthy living social technology with mothers in particular being resourceful in influencing the health of the family and the adoption of the technology. 2) Parents remain conscious of and concerned about their own health and that of their families, even as they use the social technology. 3) The healthy living social technology should support fun especially for children.

### Design process and features

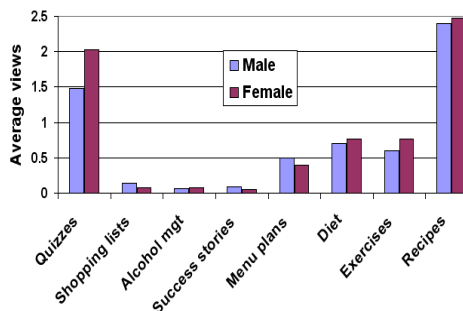
SOFA is a family-based healthy living portal supporting families to adopt a healthy lifestyle. The design has been informed by a previous study of a weight management portal [4]. Our design process involves HCI experts, domain experts (health and nutrition specialists and psychologists), and potential users (families). SOFA has a content component and a social networking component. The content consists of scientifically validated diet and lifestyle information

(e.g. recipes, exercises, shopping lists, and success stories) sourced from the CSIRO Total Wellbeing Diet book [15]. The social networking component consists of three core areas: a *homepage*, a *profile* page, and a *forum*. The *homepage* (Figure 1) provides users with summary information about the activities of others (e.g., friending, blogging, etc). The *profile* page enables users to create their online identity by adding their personal details. The *forum* enables users to discuss and share information.

### User evaluation

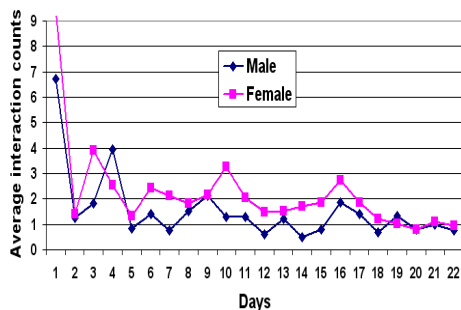
The purpose of our user evaluation was to identify and characterize gender- and role- specific differences in family-based online social networks for healthy living. In particular, we intend to compare between male and female users and between parents and children in terms of interaction with the entire portal and specific features (such as forums, blogs, profiles, healthy living content, etc), adoption of the portal, and the impact of the portal on users' attitude toward healthy living and learning about healthy living.

Interaction with the portal and specific features is computed using the amount of interaction with the portal. We consider the number of: logins, page views, content contribution (forums, blogs, quizzes completed, diary entries), and friending. We assess adoption based on the user’s interaction with the portal on a daily basis.



**Figure 2.** Average views of specific content - gender.

Eligible participants were Australian families of 2 parents and 2 children aged 10 to 17. The family members were required to be residing together and be familiar with online social networks. The user evaluation was conducted in July/August 2009. It consisted of 3 main stages: 1) Pre-interaction: Participants completed an online screening and demographics questionnaire. 2) Interaction: Participants interacted with the portal over a period of 3 weeks and interaction data was logged. We also sent out update/reminder emails to all participants every 4-6 days. 3) Post-interaction: Users completed an online user experience questionnaire. The questionnaire was aimed at gathering information about the participants’ experience with the portal, whether and how the application had an impact on their family, and whether they would recommend it to other families.



**Figure 3.** Average day by day interaction - gender.

545 users interacted with the portal. Of these, 279 were female and 266 male, 269 were parents (137 mothers and 132 fathers) and 276 children (142 daughters and 134 sons). 348 users completed the post-interaction user experience questionnaire. Of these, 176 were female and 172 male, 177 were parents (88 mothers and 89 fathers) and 171 children (88 daughters and 83 sons).

## Results and Discussion

In this section, we present and discuss the results first based on gender and later based on family role.

### Gender

Females interacted with the portal more than males. Females had an average interaction score of 50.2, and males 41.3. Moreover, females interacted more with most portal features (e.g., forums, diary, healthy living content, etc). Figure 2 shows the average interaction with each of the types of content provided by the content-based component. Although females outperformed males in viewing the content in general, the males’ interaction with the shopping lists is significantly greater than that of females ( $t(543)=1.95$ ,  $p<=0.05$ ; henceforth independent-samples two-tailed t-test). With increased numbers of women entering the workforce, men are playing a greater role in planning, shopping and preparing family meals [9].

Females lead in terms of interaction on each day except day 4 and day 19 (Figure 3). The females’ day by day spikes however occur before (and are often higher than) the males’ spikes. We thus conclude that females are earlier adopters of our social technology.

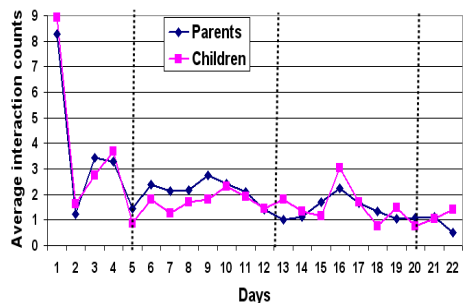
In summary, female participants demonstrated more interaction than male. They may also be considered as early adopters of the healthy living social technology.

### Family role

Parents and children had comparable overall interaction levels with the portal. Parents had an average interaction score of 46.7, and children 45.1. As for interaction with specific portal features, parents had a slightly higher number of interactions with the content.

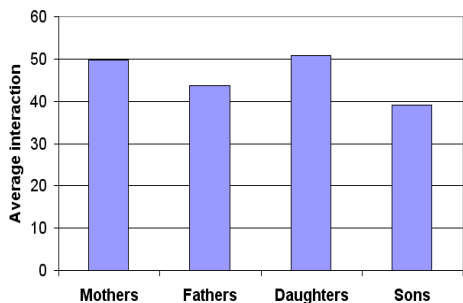
Children were slightly leading in adding friends, which is consistent with [18].

Figure 4 shows the parents’ vs. children’s average day by day interaction. The days we sent our updates/reminders are denoted by vertical dotted bars. Children responded well to our initial invitation (day 1) and to our updates/reminders. Children’s day by day interaction is slightly more erratic than that of the parents especially in days 1-5 and days 12-20. This is consistent with the tendency of children to have shorter attention span [17]. We also analyzed the family interaction data by breaking it into: mothers, fathers, daughters, and sons. Daughters were the most active users, followed by mothers (Figure 5).



**Figure 4.** Average day by day interaction – family role.

The user experience questionnaire data shows that there was a higher expectation that the portal should have provided more fun for children. This emphasizes the importance of fun in designing for families [10] as fun is one of the ways that can be used to keep children’s attention [16]. The questionnaire data also shows that significantly more parents than children reported that: “using the portal resulted in a change of their perception towards healthy living” ( $t(346)=1.98, p<=0.05$ ), they learned more on healthy living from using the portal ( $t(346)=4.09, p<=0.05$ ), and they would recommend using the social network to other families ( $t(201)=3.32, p<=0.05$ ). Note that this was an optional question to which only 203 participants responded. Considerably more mothers than sons and daughters reported that they learned more on healthy living from using the portal. Significantly more mothers than sons reported that they would recommend using the social network to other families ( $F[3,199]=4.94, p<=0.05$ ). Mothers can thus be resourceful in



**Figure 5.** Average interaction – specific family role.

influencing adoption of the technology by bringing outsiders into the network.

In summary, parents remained conscious of and concerned about health issues (keen on learning, perception) even as they interacted with the social technology. They often bear the primary responsibility of ensuring that the family is healthy. This is especially apparent in the data pertaining to the mothers. Literature suggests that women show greater responsibility towards health issues than men [7]. Our study has also shown that mothers can play a major role in influencing other people’s adoption of the healthy living social technology.

**Future work and Conclusions**

This paper has reported a preliminary user study aimed at identifying gender- and role-related characteristics and differences in interaction with family-based healthy living online social networks to influence the design of a fully interactive service. The study brings to light several interesting findings regarding such online social networks. Females play a major role in leading the adoption and usage of the social technology; parents remain conscious of their family’s health as they interact with the social technology; and the social technology should support fun especially for children.

The study provides us with resourceful information as we move on to employing personalization and recommendation technologies to push forward healthy living content and social features based on users’ characteristics and their interaction with the portal. The recommendations will help users in planning and in accessing healthy living resources specifically relevant to them.

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