
Age Differences in Online Social Networking

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Abstract

This study presents an analysis of age-related differences of user behavior in the social network site MySpace.com. We focus on two age groups: older people (60+ years of age) and teenagers (between 13 and 19 years of age). We used locally developed web crawlers to collect large sets of data from MySpace's user profile pages. We used different analytic techniques to quantify any differences that exist in the networks of MySpace friends of older people and teenagers. Content analysis was applied to investigate age-related differences concerning the way users represent themselves on their profile pages. Our findings show that teenagers tend to have much larger networks of friends compared to older users. Also, we found that the majority of teenage users' MySpace friends are in their own age range (age +/- 2 years), whilst older people's friends tend to have a more diverse age distribution.

Keywords

Ageing, computer-mediated communication, social networking sites

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H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous; K4.2. Computers and society: Social issues

Introduction

Social networking sites (SNS), like MySpace, Facebook, Friendster and LinkedIn have become more and more popular in recent years [3] and continue to attract a large number of users [1]. This makes SNS of increasing interest for researching group-building and community behavior in online settings.

The growing popularity of SNS has influenced academic research, and scholars have started to investigate the communication and interaction between people in these sites. However, only few of the current studies into SNS look at differences in usage of these sites by different user populations, e.g. age-related differences. A study undertaken by comScore found that there is a growing trend of older users on SNS such as MySpace, FaceBook, and Friendster [2]. However, it did not investigate whether there were any differences in how older people use the SNSs compared to younger users. Studies in other CMC environments, for example usenet online communities, found that there is a distinction in the network structure and behavior between teenagers and older people [6]. This raises the question whether differences are also present in SNSs. Our study aims to address this issue by investigating in detail the differences and similarities of older people and teenagers participating in MySpace.com. In particular, we are interested in:

- Identifying any age-related differences in the type and number of MySpace friends users have.

- Analyzing any age-related differences in the way people represent themselves on MySpace.

In order to investigate these issues, we collected a large number of profile pages from MySpace with the use of web crawlers we built.

Methods*Development of automated web crawlers*

The crawler was coded (using Ruby programming language) to click on all the friends of a given user and retrieve and store their profile information into a CSV file. The crawler visits profile pages based on information in a separate HTML document. On visiting a profile page, the crawler uses regular expressions to collect the requested data for a given user and then moves on until the list is complete.

After creating the crawler, we collected random profile IDs of 50 teenage users (aged 13-19) and 50 older users (60 years old and above). The age ranges are in line with other similar studies, for example [6]. To allow for some analysis based upon gender, we restricted the sample to 25 teenage girls, 25 teenage boys, 25 older women and 25 older men.

Content Analysis

As pointed out in the introduction section our second aim was to analyze any age-related differences in the way people represent themselves on MySpace. To do this we had to focus on the actual content participants use to describe themselves on their pages.

A second sample of 70 older people and 70 teenagers (half male/female) was randomly selected and the textual content of the "About Me" sections on their pages was retrieved using the developed crawler. The

"About Me" section is the profile page used by users to describe themselves in approximately 100 words. We then conducted a content analysis on the "About Me" section of each MySpace page in our sample.

The actual quantitative analysis was done using the LIWC (Linguistic Inquiry Word Count) tool developed by [5]. "LIWC is a contextual analysis tool which calculates the degree to which people use different categories of words across a wide array of texts." [4]. This online application allows the user to insert text and investigates this text in respect to associated words for seven dimensions:

- Self reference: People who use a high rate of self references tend to be more insecure, nervous, and possibly depressed. They also tend to be more honest.
- Social words: Social words are words that make reference to other people (e.g. they, she, us, talk, friends). Generally, people who use a high number of social words are more outgoing and more socially connected with others.
- Positive emotion words: The more that people use positive emotion words (e.g. happy, love, good), the more optimistic they tend to be.
- Negative emotion words: Use of negative emotion words (e.g. sad, kill, afraid) is weakly linked to people's ratings of anxiety.
- Overall cognitive words: These are words that reflect how much people are actively thinking about their writing topic. Examples include: thinking, wonder, because, knowledge.
- Articles: The three article words - a, an, and the - account for a large percentage of the words we use.

People who use articles at a high rate tend to be more concrete and impersonal in their thinking.

- Big words (words with more than 6 letters): Use of big words is weakly related to higher grades and standardized test scores. People who use a high rate of big words also tend to be less emotional and sometimes psychologically distant or detached. [4]

Results-Discussion

Age-related differences of friend networks

In order to investigate age-related differences in the friend networks of teenagers and older people, we studied the average number and age of MySpace friends in the sample's friend networks (Figure 1). The average age of teenagers in the sample is 16.5 (N=50; SD=0.76). The results indicate that of the 50 teenagers in the sample, most have friends aged 16-18. Further analysis shows that the mean number of teenage friends is 95 (N=50; SD = 88.86). The high standard deviation illustrates that the number of friends is hugely dispersed in our sample of teenagers. The mean number of friends of teenage girls and boys is 122 (N=25; girls) and 69 (N=25; boys), respectively. These findings also show that teenage girls have more friends than teenage boys ($t(24)=2.29, p<0.05$).

Our sample of older users tend not to have many friends. Also, the distribution of the friends' ages is a lot more spread out. This shows that older people tend to have friends from various age groups, compared to teenagers whose friends tend to be within their own age group. The age distribution for older people's friends shows also a peak in the teenage age group, which could represent grandchildren/great grandchildren which older users have added to their

friends list. The average age of older people in our sample is 63 (N=50; SD = 3.95). When averaging the total number of friends we found that older people have on average 18 friends (N=50; SD =22.15). The lower standard deviation compared to the teenage sample suggests that older people have similar numbers of friends compared to teenagers whose number of friends differ extremely across the sample. The mean number and standard deviations of friends of older men and women is 16 (SD=15.74; men) and 21 (SD=27.22; women) respectively. The analysis of our data showed no significant differences in friends number of older men and women ($t(24) = 1.41, p > 0.05$).

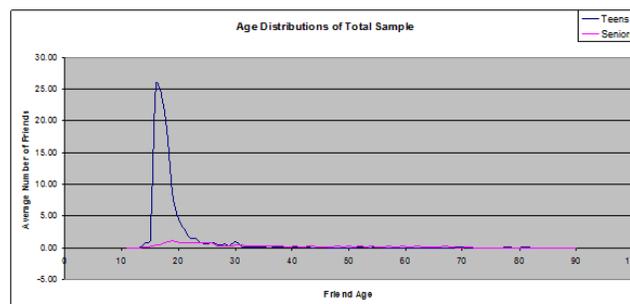


Figure 1: Comparison of age distributions of older people and teenagers' MySpace friends

To investigate whether teenagers have more friends than older people, we compared the number of friends of teenagers and older people. Results show that teenagers do have more friends than older people on MySpace. A t-test showed that this difference is significant ($t(49) = 5.87, p < 0.05$). A t-test also verified that teenage girls have more friends than older women ($t(24) = 4.98, p < 0.05$) and teenage boys have more friends than older men in the sample ($t(24) = 3.47, p < 0.05$).

Comparing the age distribution, our results show that 61.9% of teenager's friends are in their immediate age range (+/- 2 years). This is the case for only 2.4% of older people. This finding could be due to the fact that although the number of older users of MySpace may be increasing, there are still proportionately more users in the lower age ranges as the above analysis suggests. Further t-tests also concluded that teenage girls have proportionately more friends who are not in their age group (+/- 2 years) when compared with older women ($t(24) = -3.55, p < 0.05$). Similar results were found for teenage boys when compared to older men ($t(24) = -2.29, p < 0.05$).

A t-test showed that teenagers tend to have more friends of their opposite sex than that of their own ($t(49) = 3.83, p < 0.05$). Similarly, teenage boys were found to have more female friends than senior males, as a proportion of their total friends ($t(24) = 3.55, p < 0.05$). However, this result is not mirrored when testing whether teenage girls possessed proportionately more male friends than older women ($t(24) = -1.26, p > 0.05$) ('proportionately' in this sense refers to the amount of male friends a female has as a proportion of her total friends).

Age-related differences in the self-representation

Figure 2 represents the LIWC scores for older people's and teenagers' profiles.

The results indicated that teenagers use more self references ($t(69) = 4.68, p < 0.05$), negative emotions ($t(69) = 3.41, p < 0.05$), and cognitive words ($t(69) = 3.20, p < 0.05$) than older people. The fact that teenagers tend to include a lot of words referring to themselves and to negative emotions could be an

indicator of teenagers experiencing emotions associated with puberty. The t-tests also concluded that the sample of older people use more articles ($t(69)=-4.22$, $p < 0.05$) and big words ($t(69)=-6.22$, $p < 0.05$) than teenagers, indicating that older people tend to describe themselves in a more formal way than teenagers do.

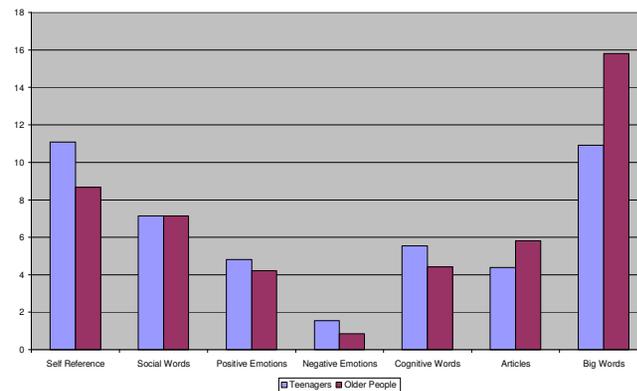


Figure 2: Age comparisons of LIWC scores

Looking at teenage boys and girls separately, we also found gender-related differences in the content of the profile pages. T-tests confirmed that teenage girls use more self references ($t(34)=2.44$, $p < 0.05$), social words ($t(34)=2.59$, $p < 0.05$), and negative emotions ($t(34)=2.55$, $p < 0.05$) in the profile pages than teenage boys. According to LIWC (LIWC Inc. 2007), people using more social words in their self descriptions tend to be more outgoing and socially connected with others. The fact that teenage girls receive a higher score in this sample fits with our previous findings, as girls are also found to have more friends than teenage boys.

The t-tests verified that older women write more self references than older men in their MySpace profile pages ($t(34)=-2.06$, $p < 0.05$). This trend was similar to that of the teenager sample. It shows that females tend to include more words referring to the self in the description of themselves on the profile page. We were expecting the t-tests to also reveal women as using more social words than men, indicating that females also make more references to friends and other members of the community. However, the t-test disproved this expectation, ($t(34)=-0.70$, $p < 0.05$). This was a rather interesting finding as it demonstrated some similarities between the sexes of different aged participants. In general, the findings show that both older and teenage women tend to be more expressive than older and teenage males in their self descriptions on MySpace.

T-tests on this data revealed that teenage girls use more self references ($t(34)=-3.70$, $p < 0.05$) and negative emotions ($t(34)=-3.69$, $p < 0.05$) than older women. Older women use more articles ($t(34)=2.18$, $p < 0.05$) and big words ($t(34)=4.09$, $p < 0.05$) than teenage girls. These findings indicate that teenage girls include a lot of words referring to themselves in an emotional way (often including words that refer to negative emotions). In contrast, older women tend to represent themselves in more formal writing (including more articles and big words) than teenage girls. Similarly, teenage boys, like teenage girls, use more self references than older men ($t(34)=-2.87$, $p < 0.05$). They are also found to use more overall cognitive words than the older men ($t(34)=-2.60$, $p < 0.05$) which indicates a more thoughtful and reflective writing. Similarly to older women, older men are found to use more articles ($t(34)=3.47$, $p < 0.05$) and big words

($t(34)=4.44$, $p < 0.05$) than teenage boys. Again, this suggests that older men describe themselves in a more formal way than teenage boys do.

Conclusion

Our study brings to light interesting findings of the characteristics and age-related differences of MySpace users. We identified significant differences between the friend networks of teenagers and older users. We also identified age-related differences in the way people verbally present themselves online. The fact that this process was automated enabled us to collect data from a larger sample.

Future research

We encourage researchers to use and deploy the crawlers which could be used for collecting data from a larger sample. Replicating this study over a much larger population will inevitably yield a set of results which are more robust and representative of the population of MySpace. Furthermore, as MySpace is just one of a few hundred social networking websites, similar crawlers can be created for other SNSs. It would also be interesting to replicate this study using several social networking sites, or even looking at list servers or newsgroups.

In addition, we also encourage researchers to apply query-based research (e.g. interviews with MySpace users) in order to investigate how older people perceive MySpace compared to teenagers. It would be interesting to see whether user's opinion of using

MySpace match our findings about age differences in the usage of MySpace. Also, virtual ethnography techniques could help to study these differences in more detail.

Practitioners could use our findings to help understand what interests the different types of users of MySpace, and how they can stimulate this interest to incite existing members to re-visit the site and new members to join up.

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