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## Gendered Internet Use across Generations and Life Stages

### Background

Offline inequalities, such as those in income and education, are reflected in the ways in which people engage with technologies (Norris, 2001; van Dijk, 2005). Researchers are concerned about these differences in engagement because they might reinforce existing unequal distributions of power in the home and wider society (Loader, 1998; Warschauer, 2004). One of the offline inequalities that is mirrored online is the differences between men and women.

Research shows that over the last decade gender differences in access to the internet have decreased and are now very small in countries such as Britain and the US (Dutton & Helsper, 2007; Fallows, 2005; ONS, 2007). In spite of near equality in internet access, considerable gender differences continue to be found in breadth of use (Ono & Zavodny, 2003; Wasserman & Richmond-Abbott, 2005) and internet skills (Broos, 2005; Hargittai & Shafer, 2006; Joiner et al., 2005; Torkzadeh, Chang, & Demirhan, 2006). Since younger generations show smaller gender differences in ICT use (Ono & Zavodny, 2003, 2007), these differences are argued to be generational and thus temporal. The explanation is that young women's familiarity with the technology is similar to that of young men, while older women grew up in an environment that was very different from that of their male peers. If generation is indeed the main determinant of gender differentiation these differences should disappear over time as older generations die. Today's teenagers grow up in a completely different ICT environment than their parents and these generational differences will no doubt influence how they use the internet. If differences between gender groups are mainly related to generational or cohort effects

then current teenagers' behaviors and gender differences can be used to forecast what the information society will look like in the future.

However, others argue that gender differences in behavior are shaped as much by socialization as by generation (Gill & Grint, 1995; Herring, 2002; Selwyn, 2007; Singh, 2001; Wajcman, 2004). The latter scenario implies that 'real life' gender roles vary between men and women depending on the stage of life they are at (eg. marital status, occupation, parenthood). It follows that if gender differences in ICT use are linked to life stage, they will continue to persist in the future. If a main determinant of differences in ICT use is indeed life stage instead of cohort, then there might be a change in current teenagers' behavior when they marry or are employed. The behavior of adults who currently find themselves at these life stages would in this case be a better predictor of what future adult online behavior will look like than young people's current behavior. This paper tries to unpick the roles played by generation and life stages in relation to gender differences in internet use in the UK.

#### Issues in gender and internet research

Existing research about the influence of gender on internet use has some limitations. Two main issues are the 'generalization' and 'generation and life stage' problems of internet and gender research.

The first issue, the 'generalization problem', is that research reports often draw conclusions about the gendered use of the internet without making distinctions between different groups of men and women. In trying to understand the unique effect of gender on internet use, earlier studies controlled for socio-demographic factors such as

generation and socio-economic status as well as for the level of experience that men and women have with the internet. For example, the Pew Internet and American Life project surveyed 6,403 men and women and showed that gender and age made a difference (Fallows, 2005). Men used the internet more broadly and more intensely than women and older people less than younger people (see also Wasserman & Richmond-Abbott, 2005). However, almost all of these studies fail to make an explicit comparison of gender differences within different generational, occupational, and other groups. An exception is a study conducted by Weiser (2000) who found that gender and age did not interact significantly. In this study, the difference in attitudes towards technologies between men and women were similar in all age groups. However, he used non-representative samples of 506 undergraduate students and 684 volunteer participants. They participated following an advert they were shown if they typed in the words 'internet', 'surveys' and 'search engine'. This limits the generalizability of this study's findings.

The second, 'generation and life stage' problem, refers to the focus on men and women of certain generations and occupations when researching internet behavior. The continued use of university students as subjects for studies leads to the comparison of a very specific group of women with a very specific group of men (eg. Joiner et al., 2005; Odell, et al, 2000). More importantly, it leads to the comparison of expert (young and highly educated) women with young expert men. The activities these participants undertake are likely to be different from those undertaken by people of the same generation who are not in education. If the focus is not on students it is often on the use of the internet at home, which typically has an overrepresentation of middle aged women with young families (eg. Cummings & Kraut, 2002; Dholakia, 2006; Faulkner, 2002;

Livingstone & Helsper, 2007). Very rarely are gender differences in ICT use studied amongst individuals with different types of occupations. An exception is a study conducted by Ono and Zavodny (2005) which looked at differences between men and women in different types of employment and those without work in Japan and the US. They found that employment was related to larger gender gaps in Japan, but not in the US where gender differences were minimal for all groups. They argued that this might be due to the type of employment that women and men traditionally occupy in Japan. However, their study did not distinguish between unemployment, retirement and caretaker functions of those who were not in employment. In addition, while the authors did control for other life stage factors such as marital status in their analyses, they did not report on its independent effects.

This focus on young students and middle-aged individuals in traditional households and occupations means that older individuals and individuals who live in non-traditional households are often left out of research findings. There are exceptions, such as a survey by Selwyn, Gorard, Furlong and Madden (2003), which focused on older adults. They found that internet use was stratified according to gender, marital status and educational background. However, their sample was restricted to those over 60 and therefore could not be used to compare gender differences across different generational groups. Similarly, Cody, Dunn, Hoppin and Wendt's (1999) study also argued that life stage is as important as age in determining internet use amongst the elderly but did not offer a comparison with other generations. Grimes, Hough, and Signorella (2007) investigated gender differences among employed and retired people and concluded that age differences were more pronounced in men than in women. However, since their study

was restricted to e-mail spam these results might not be generalizable to other uses. Loges and Jung (2001) conducted a study that investigated whether the elderly differed from younger generations in how central the internet was to their lives, they found that when controlling for other factors there was no such difference. This could be a potential argument against a life stage effect. However, this study was focused on ethnic minorities and did not take into account gender differences (besides controlling for gender), nor did it investigate whether these factors related to different life stages, as opposed to different lifestyles as exemplified by internet centrality, had an influence on internet use.

Existing studies have thus not provided a complete insight into how gender interacts with other socio-demographic factors related to life stage such as occupational or marital status. It is therefore difficult to know whether differences between men and women will disappear as current generations grow older or whether there is something inherent to certain life stages which means these differences will persist when young generations grow older.

#### Life stage approach

A life stage approach towards gendered behavior proposes that certain positions in everyday life encourage individuals to adopt typically female or male roles. Shifts between life stages are defined in this paper as the traditional points in a person's life where daily rhythm and routine alter drastically due to a change in a person's role in society. Two types of shifts have been identified as important factors influencing individuals' lives; occupational shifts and relationship developments. Occupational shifts are related to the main activity that occupies a person's day. Occupational life stage

cycles generally start with education after which most shift to employment. This move from student to employee is partly marked by a decrease in personal freedom as well as by an increase in responsibilities and in disposable income. There are marked gender differences especially amongst employed men and women. Women are generally in lower qualified occupations and are more often caretakers than men (Bobbitt-Zeher, 2007; Denton & Boos, 2007; Hogan, Perrucci, & Behringer, 2005; Joshi, Makepeace, & Dolton, 2007; Kangas & Rostgaard, 2007). The next shift in occupational life stages comes when people retire. Amongst students and retirees men's and women's circumstances tend to be more equal than during the employment stage. Unemployment is also marked as a distinct life circumstance in which men and women tend to be more equal than while in employment.

In this paper, these distinctions between occupational life stages are assumed to be reflected in internet use, which leads to the following question:

*Q1:* Are differences between men and women in internet use largest at the employment life stage?

A classification of life stages in relationship development starts with very broad distinctions between being single and being in a relationship. Studies of gender roles in relationships usually compare cohabiting and married couples. An exception is a study by South and Pitze (1994) which compared cohabiting and married individuals with divorced and widowed individuals. They found, as did a number of other studies, that the distribution of activities at home was more traditionally gendered in married couples (See also Barber & Axinn, 1998; Brown, 2003). Changes in behavior between marital status stages are generally larger for women; men appear to have more stable patterns of

behavior related to gender roles. Furthermore, cohabiting women tend to be more similar to single women than to married women unless both partners see the cohabitation as a precursor to marriage (Rindfuss & Van Den Heuvel, 1990). In summary, marriage still tends to introduce the most drastic shift related to relationships in offline gendered behavior. Parenthood is often studied in addition to marital status as an indicator of life stage. Becoming a parent has been found to amplify gendered roles in relationships (Belsky & Pensky, 1988; Cowan & Cowan, 1992). This paper asks the following question to understand if relationship stages are reflected in online behavior.

*Q2:* Are gendered patterns of online behavior more pronounced within individuals who are in a long term relationship and for individuals with children?

Gender differences are likely to be related to a mix of both life stage and generational effects. A combination of the aforementioned generation and life stage approaches leads to the following hypothesis about a possible interaction effect of gender, generation and life stage:

*H1:* Generation has a main effect on internet use with younger people using the internet more than older people, but life stage influences the differences between men and women so that differences at some life stages are greater than at other life stages.

[Figure 1 here]

Figure 1 illustrates a life stage model in which gender differences within different generational groups are said to be influenced by life stage, while the average level of use is determined by generation.

Gendered internet use



The internet provides a range of different opportunities for engagement. This paper will examine the relationship between life stage and internet use (questions 1 and 2) and test hypothesis 1 for general internet use and three specific uses of the internet which have been linked to gender differences in past work.

Previous research has established that men and women differ as regards the online content and platforms they engage with. In this context communication and entertainment are the most commonly studied activities. Communication is considered more typically female and entertainment typically male (Faulkner, 2002; Jackson, et al, 2001; Li & Kirkup, 2007; Shaw & Grant, 2002; Weiser, 2000). This is not to say that communication and entertainment are clearly defined, separate activities; communication can be entertaining and online entertainment can involve communication. However, different platforms carry signifiers as regards the primary function of what they offer (eg. games are primarily for entertainment and chat rooms primarily for communication). Similarly, different types of content are classifiable in terms of their primary function independent of how they are used in practice.

There is ample evidence for male types of internet content, that is, there are platforms that are clearly dominated by men with low female participation. These tend to be sexual and entertainment focused (eg. game playing) (Papastergiou & Solomonidou, 2005; Traeen, Nilsen, & Stigum, 2006; Weiser, 2000). In contrast, the research discusses a narrower range of clearly female types of sites or activities. One of these is the search for health information (Escoffery et al., 2005; Karavidas, Lim, & Katsikas, 2005; Warner & Procaccino, 2007). Anderson et al (2004) in one of the only truly longitudinal panel studies in this area showed that online health searches were more frequent amongst older

women who tended to use the internet at someone else's home. An online activity that is less clearly gendered is internet shopping. Shopping is an interesting activity in comparison to other behaviors because women tend to engage more in shopping offline. However, online shopping which includes 'window shopping' on price comparison sites and actual purchases often shows the opposite pattern, with men being more active shoppers than women on the internet (Dittmar, Long, & Meek, 2004; Garbarino & Strahilevitz, 2004; Wolin & Korgaonkar, 2003). Nevertheless, there is some evidence to the contrary as well particularly when it comes to younger generations, Gross (2004) found that teenage girls shop more online than boys do. The general male dominance of online shopping might be related to it being interpreted as part of a wider class of activities that could be labeled economic or financial which also include banking and investing. These are primarily aimed at saving money or acquiring goods and not on the more experiential type of consumption as described by Holt (1995). Offline functional consumption is dominated by men and experiential consumption tends to be more female (Ditmar et al 2004; Holbrook & Hirschbrun 1982). While gender differences have also been found for general information seeking and more participatory activities (see Dutton, Helsper & Gerber 2009) this paper focuses on those activities that are most clearly gendered and where life stage differences might be expected.

After a descriptive analysis of the differences in the UK between men and women on the most common internet uses, this paper will examine the influence of life stage and generation on three uses; one clearly male (sexual material), one female (health searches) and one that in the offline world is female gendered but which is less clearly gendered online (shopping). H1 is tested for these specific uses to understand whether the patterns

of interaction between gender, life stage and generation differ for clearly and ambiguously gendered uses.

### Methodology

This paper uses 2007 data from the Oxford Internet Survey (OxIS)<sup>1</sup>. These OxIS surveys used a nationally representative random sample of 2,350 people aged 14 and older in Britain (England, Scotland and Wales). Interviews were conducted face-to-face in people's homes. A two-stage random sampling design was used. First, a random sample of 175 areas in Britain was selected, stratified by region. Then, within each selected area, a random sample of 10 addresses was selected from the UK Postal Address File. The data were weighted according to the UK Census based on gender, age, socio-economic grade, and region. The response rate using this sampling strategy was 77%. The analyses in this paper use the data of the 1,578 internet users.

### Measures

Four categories of variables were created from OxIS to be able to conduct the analyses and test the hypotheses: gender, generation, life stage, and internet use. The construction of these variables is described in this section.

#### *Gender, Generation and Life stage*

[Table 1 here]

*Generation* The participant was asked in which year they were born. 10 year periods were interpreted as delineating generations, with the exception of the youngest participants which were split into a generation of teenagers and young adults to account for possible generational differences between first and second generation digital natives (see Helsper & Eynon, in press): 14-17 yrs, 18 to 24 yrs, 25 to 34 yrs, 35 to 44 yrs, 45 to 54 yrs, 55 to 64 yrs, 65 to 74 yrs, 75 + yrs. This scale from 1 to 8 was used as an ordinal variable in the regressions presented in the paper.

*Gender* was noted by the interviewer - the distribution of men and women was equal over the sample.

*Life stage* was divided into 'marital status', 'occupation' and 'children'.

'Marital status' was measured through the question: "Are you...? 'Single', 'Married', 'Living together with a partner', 'Divorced, separated' or 'Widowed'."

'Occupation' was based on the question "Which of these descriptions best describes your current situation?" Five categories were created: 'Student' (Part time, full time, postgraduate and undergraduate), 'Employed' (part-time and full time employed), 'Retired', 'Unemployed' (unemployed or unable to work) and 'Caretakers' (doing housework or looking after the children).

'Children' measured whether or not there were people under 18 in the household.

For the regressions presented in this paper the Gender, Marital, Occupation, and Children variables were dummy coded based on the categories described above.

*Internet behavior*

A factor analysis identified different classes of applications and content out of all the internet use variables available in OxIS (see Author 2008). Three types were selected for detailed analysis based on their gendered nature as observed in previous research. Sexual material searches and health information searches showed up as single item measures, while the other classes of content all consisted of several items that loaded higher than .30 on a related factor. Participants were asked for all activities ‘How often do you...?’ and answered on a scale ranging from 1 ‘never’ to 6 ‘several times a day’ (intermediate categories were ‘daily’, ‘weekly’, ‘monthly’, ‘less than monthly’).

The ‘Sexual material’ question asked how often people looked for ‘Sites with adult (sexual) content’ ( $M = 1.25$ ;  $SD = .73$ ).

The ‘Health’ question asked how often people looked for information on health and medical care on the internet ( $M = 2.13$ ;  $SD = 1.05$ ).

‘Shopping’ was a composite measure how often people said they ‘Get information about a product or service’, ‘Buying a product or service online’, ‘Making travel reservations/bookings’ and how often they ‘Compare products online’. The scores across these items were averaged ( $M = 2.54$ ;  $SD = .78$ ,  $\alpha = .78$ ).

For the descriptive analyses seven additional classes of content were selected from the factors identified, these classes of content can be roughly grouped into the communication, entertainment and economic participation categories identified earlier as potentially interesting in terms of gender distinctions.<sup>2</sup>

Communication – Social networking and Personal communication

‘Online Social Networking’, the only activity with a five point scale (from 0 to 4) which measured whether participants had posted messages on discussion boards, kept a blog, created a website, and whether they had created a social networking profile in the last year ( $M = .65$ ;  $SD = 1.06$ ,  $\alpha = .72$ ). ‘Online Personal Communication’ measured how often internet users participated in the following activities on the internet (‘Instant messaging’, ‘Emailing’, ‘Chat rooms’, and ‘Making phone calls using the internet’) ( $M = 2.69$ ;  $SD = .98$ ,  $\alpha = .72$ ).

#### Entertainment – Play, Entertainment, and Leisure

‘Play’ measured how frequently internet users ‘played games online’ and ‘participated in betting and gambling’ ( $M = 1.62$ ;  $SD = .84$ ,  $r^2 = .18$ ,  $p < .0001$ ). The ‘Entertainment’ variable referred to how often people ‘downloaded music’, ‘downloaded videos’, and ‘listened to a radio station’ ( $M = 1.92$ ;  $SD = .67$ ,  $\alpha = .70$ ). ‘Leisure’ measured the frequency with which participants looked for information on ‘travel’ and ‘local events’ ( $M = 2.40$ ;  $SD = .87$ ,  $r^2 = .30$ ,  $p < .0001$ ).

#### Economic participation - Online finance

‘Finances’ measured how often people used the internet to manage their personal and household finances (‘Paying bills’, ‘Use bank’s online services’, ‘Checking investments in stocks/funds/bonds’) ( $M = 1.88$ ;  $SD = .94$ ,  $\alpha = .75$ ).

#### Breadth of use

This variable measured the range of activities that people undertake on the internet, a scale that ranged from 0 to 55 (the sum of all the online activities measured in the survey) and which gave equal weight to entertainment, information, commercial,

political and other types of activities ( $Mdn = 19$ ;  $M = 19.23$ ;  $SD = 8.86$ ,  $\alpha = .91$ ). The individual items have been listed in the 2007 OxIS report (Dutton & Helsper, 2007).

#### Findings: Breadth of Use

To establish a baseline for a wide range of online activities, simple descriptive analyses were performed comparing men and women. These two groups were compared for both the average frequency with which they undertook each activity and the percentage within each group that undertook the activity in the last year.

[Table 2 here]

Table 2 shows that men undertook all activities more frequently than women with the exception of leisure and health information activities. The only activity that was undertaken more frequently by women than men was looking for health information. Similarly, the percentage of men who undertook any particular activity in the last year was almost always higher than the percentage of women who undertook the same activity. There were a few exceptions; men and women did not differ in how likely they were to use the internet for personal communication, finances, online leisure and online shopping. Thus, while women used the internet less frequently for personal communication, finance, and shopping, the likelihood of them doing this at all in the last year did not differ from men.

The analyses that follow will examine the relationship between gender, generation, life stage and breadth of use. This is followed by a discussion of the findings in relation to clearly gendered (sexual material and health information) and less clearly gendered (shopping) online activities. Moderated stepwise regressions were used to

understand if these gender differences in internet use vary by generation and by life stage. Gender was entered at the first step, the Life stage and Generation variables at the second step, and the interactions terms with Gender at the third step.

#### Findings: Explaining Breadth of Use

The linear regression presented in Table 3 shows that older internet users undertook a narrower range of online activities and that women and men differed in breadth of use only within certain generation groups. Similarly, those who were employed or were students were more active than those of other occupational categories and retired people less active than those from other occupational categories.

[Table 3 here]

[Figure 2 here]

Figure 2 shows that the differences between men and women were largest in the oldest generations ( $\Delta = 3.59$  for 65-74yrs and for  $\Delta = 6.36$  for 75+yrs) and smallest for the generations of so-called digital natives ( $\Delta = 0.80$  for 14-17yrs and  $\Delta = 0.25$  for 18-24yrs). The differences between men and women of the wartime generation (65 to 74 years) were actually smaller than the differences between some of their younger counterparts. Only from the generation of 35 to 44 year olds onwards did men clearly use the internet more broadly than women and did average breadth of use continuously decrease. In the younger generations the breadth of use was smaller than in the middle-aged generations. Figure 2 clearly shows a non-linear relationship between generation and internet use as well as an interaction between gender and generation ( $t = 3.58, p < .01$ , see Table 3).



### Findings on Specific Uses

To understand whether the effects of gender, generation and life stage varied for differently gendered activities, moderated regressions were conducted for sexual material, health and shopping activities. As before Gender was entered at the first step, the Life stage and Generation variables at the second step, and the interactions terms with Gender at the third step. The descriptive findings supported the gendered nature of health (female) and sexual material (male) activities and showed that men used the internet more frequently for shopping than women in the UK (see Table 4).

[Table 4 here]

From Table 4 one can conclude that for all three uses (looking for sexual material, health services, and shopping online) gender was a significant independent explanatory variable. In addition, gender in interaction with different life stage characteristics explained two of the three uses significantly. Notably, these were those uses (sexual material and online shopping) which were dominated by men.

As expected, looking for sexual material was clearly related to the gender of the person. Men were more likely to look for sexual material in all generations ( $t = -4.03$ ,  $p < .001$ ). Employed users were more likely to look for sexual material ( $t = 3.64$ ,  $p < .001$ ). In addition, the differences between men and women differed according to life stage; unemployment and marriage were the focus of these interactions. Generation did not influence looking for sexual material online neither independently nor in interaction with gender.

For health searches generation was not a significant factor either, but gender and life stage were significantly related to this type of use. Women looked more frequently for health information than men independent of the life stage or generation group they were in. Employed people were also more likely to search for health information than the other occupational groups. No significant interactions between gender, generation and life stage were found for health.

For the shopping variable, there were main effects of generation and life stage variables. Older people shopped online less frequently. While employed and cohabiting people shopped more frequently, unemployed people shopped less frequently. In addition, the relationship between gender and shopping differed depending on life stage and generation, in this case being married influenced this relationship between gender and online behavior more than other life stage factors.

In Figures 3 through 6 the significant interactions are depicted. Since no interaction effects were found between gender, generation, and life stage for health searches (see Table 4), no graphs are included for these relationships.

[Figure 3 here]

Figure 3 illustrates the main effect of gender found in Table 4 that men in all occupation groups used the internet more for sexual material than women. Figure 3 also shows the interaction between gender and life stage. The difference between men and women was smallest amongst those who were retired ( $t = 2.17, p = .03$ ) and more or less equal in the students ( $t = 3.28, p < .01$ ) and the employed group ( $t = 6.43, p < .001$ ). Home caretaking women were less likely to use the internet for sexual material than women with other occupations ( $t = 2.03, p = .04$ ), with the exception of retired women.

Access to sexual material varied more for men within the different occupations than it did for women.

[Figure 4 here]

Figure 4 shows that men looked more for sexual material across all marital status groups. In addition, gender differences varied widely across different marital status groups. Men who were single were 3.5 times as likely ( $t = 5.23, p < .001$ ) to look for sexual material ( $M = .28; 95\% ci = .23-.34$ ) as single women ( $M = .08; ci = .04-.12$ ), cohabiting men ( $M = .19; ci = .12-.26$ ) 2.3 times as likely ( $t = 2.87, p < .01$ ) as cohabiting women ( $M = .08; ci = .03-.13$ ), married men ( $M = .15; ci = .11-.19$ ) 3 times as likely ( $t = 4.43, p < .001$ ) as married women ( $M = .05; ci = .02-.07$ ) and divorced men ( $M = .46; ci = .32-.60$ ) 11.5 times as likely ( $t = 5.59, p < .001$ ) as divorced women ( $M = .04; ci = .00-.08$ ). While divorce seemed to influence men strongly in their use of sexual material, divorce barely changed the use of these types of sites for women.

[Figure 5 here]

Figure 5 depicts the significant interaction between generation and gender ( $t = 2.26, p = .02$ ) in relation to online shopping. The differences between men and women increased after middle age, becoming significant for the postwar generation of 56 to 64 years olds ( $t = 2.67, p < .01$ ) and those born before that. The drop in shopping activities for women was considerable, while men's shopping behavior remained constant. The figure also shows that generation was not linearly but curvi-linearly related to use; younger and older (female) internet users were less active online shoppers.

[Figure 6 here]

Figure 6 shows that differences between men and women in online shopping were small in all marital status groups, with the exception of the divorced group. The likelihood of shopping online was equal between men and women in the divorced group (90% shops online) and while men tended to do so more frequently this difference was not significant ( $t = 1.73, p = .08$ ). The difference between married men and women in the frequency in which they used the internet for shopping was significant ( $t = 4.43, p < .001$ ) 43% of married men reported doing some type of online shopping activity at least once a month in comparison to 33% of married women.

## Discussion

This paper investigated the interplay between gender, generation and life stage (ie. occupation, marital status and parenthood) as regards internet use. The descriptive and regression analyses presented showed that the internet is by no means gender neutral, and support earlier research which found that men integrate technologies more broadly into their everyday lives than women (Joiner, et al. 2005; Ono & Zavodny, 2003; Wasserman & Richmond-Abbott, 2005). Seven out of nine internet activities examined were undertaken more frequently by men which suggests that there are more internet platforms that are dominated by men than applications that have a female user base.

The findings on health searches supported previous research (Escoffery et al, 2005; Warner & Procacciono, 2007) which suggests that health is one of the few clearly female activities on the internet. However, in contrast to previous research (Faulkner, 2002; Jackson, et al, 2001; Shaw & Grant, 2002), the findings showed that women were not more likely to use the internet as a tool to communicate. Activities considered to be

typically male offline, such as looking for entertainment and sexual material, were also undertaken more by men online. Ofcourse it is important to remember that the study used self-report measures and that the difference might be influenced by differences in self-report instead of by differences in actual behavior.

Moderated regressions showed that generation also was an important factor in explaining general internet use. Nevertheless, for clearly gendered behaviors (ie. sexual material and health searches) generation had no significant independent effect, instead life stage was more important in determining the influence of gender on internet use.

This paper asked two questions related to life stage effects which were addressed for self-reports of typically male (sexual material), female (health) and gender ambiguous (shopping) uses of the internet. Q1 asked if differences between men and women in internet use are larger at the employment life stage since life circumstances, such as income and allocation of housework, differ most between men and women at this stage.

Only for the online activity of looking for sexual material were the largest gender differences found amongst employed, as well as amongst unemployed/caretaker, men and women. Based on the literature about offline gendered behavior (Evertsson & Neramo, 2007; Sayer, 2005), gender patterns were expected to differ less between men and women who were unemployed than between those who were employed and thus the prediction that gendered online patterns directly mirror offline patterns was not fully corroborated.

Employed people, independent of their gender, looked more frequently for health information and shopped more online, but occupation did not influence the gender difference for these activities (like it did for sexual material searches). Based on the

above, the tentative answer to Q1 is that life stage (occupational status), significantly influences the differences between men and women for clearly (male) gendered uses.

Q2 asked if gendered patterns of online behavior are more pronounced amongst individuals in long term relationships reflecting offline patterns. Interactions between gender and marital status were found but these interactions did not mirror findings in research of offline gendered behavior. Being in a relationship influenced gender differences for typically male activities (looking for sexual material) but these were smallest, instead of largest, for those who were married or cohabiting. This finding is not too surprising since within relationships this type of activity is often discouraged and there are outlets within the relationships for sexual needs. A more notable finding is that marital status influenced online sexual material use mainly in men and hardly changed the very low use of these types of sites by women. Divorced men were especially likely to look for sexual material while almost no divorced women said they looked for this type of material.

For classes of activities that were more typical of women (ie. health searches) there were no significant marital status relationships with gender differences. Marital status did influence gender differences in online shopping. Married men in particular were more likely to shop online. The descriptives indicated that in general, online shopping is a more male than female behavior. However, the findings in this paper do not show what type of shopping is undertaken more often by men, it could be that online shopping concentrates on more expensive purchases, an area traditionally within the realm of men, and not on everyday purchases like groceries (Vogler, Brockmann, & Wiggins, 2006; Vogler, Lyonette, & Wiggins, 2008). Future research should address this

in more detail. In a pattern opposite to that of looking for sexual material, marital status was related to greater differences in women's than in men's behavior. The lowest levels of online shopping were found for women who were married or divorced, suggesting that this activity might be taken over by the husband once people get married.

In answer to Q2, the influence of marital status on online shopping and sexual material searches suggests that life stage, as measured by marital status, influences gender differences only for those activities that men dominate online.

Surprising to note is that having children was not related to differences in internet use between men and women nor did it influence the level of use independently. This finding contradicts the research that suggests that having children is the single most important change in the routines of people's everyday lives and relationships (Belsky & Pensky, 1988; Cowan & Cowan, 1992) and an important motivator for older generations to use ICTs (van Rompaey, Roe, & Struys, 2002; Venkatesh & Vitalari, 1992).

A limitation is that the cohort survey data used to answer Q1 and Q2 do not allow final conclusions about causal effects of changes in life circumstances. A longitudinal panel study would give a better insight into how internet use changes when a person gets married, when they find employment or when they have children. Nevertheless, the regressions did allow for conclusions about the independent effects of generation and life stage.

The paper proposed and tested a generation-dependent life stage model in which gender differences in internet use are determined by life stage but the level of use was determined by generation (see Figure 1). H1 which tested this model, had to be rejected

for breadth of use, sexual material and health uses of the internet for different reasons, but there was partial support for this hypothesis in relation to online shopping.

H1 has to be rejected for breadth of use because the largest difference between men and women was found for the oldest generations and life stage had no influence on gender differences. However, this interaction between generation and gender was not linear and differences between men and women were actually stable in those generations over 45 years old where the model predicted the differences would be smaller in older generations. Those who were younger showed hardly any differences in breadth of use.

H1 is also rejected for sexual material because generation did not influence how frequently people looked for this material online even though life stage did. Similarly, this hypothesis was rejected for health searches because generation did not influence how often people looked for health information online. The lack of a generational effect might be explained by the non-linearity in the relationship between generation and health searches, where younger and older people use the internet less for health searches. The need to look for health information online for family members at middle age might outstrip the need in the older generations to find solutions for their personal health problems. However, having young people in the household did not influence these relationships and an alternative explanation might have to be found.

For online shopping H1 can be supported, generation and life stage interacted with shopping online. Differences were smallest within the youngest generations and those who were married showed smaller differences than the divorced men and women but larger than cohabiting and single men and women. While this supports the importance of incorporating different aspects of life stage into understandings of gendered internet



use, it is not obvious that offline patterns are replicated online. The life stages for which the smallest and those where the largest gender differences in shopping were expected based on offline patterns, showed respectively the largest and smallest gender differences in online shopping.

Some findings were quite surprising and raise questions that probably cannot be answered by quantitative research. Qualitative and longitudinal research could help understand, for example, what leads to the high level of self-reported sexual material searches in divorced men and what explains the low level of self-reported online shopping for single and divorced women.

## Conclusions

This paper considered gender differences in internet use and whether these varied at different life stages and between different generations. It was argued that if generation is the main determinant of ICT use, gender differences should become smaller as the current ICT savvy generation grows older. On the other hand, if life stage influences ICT use then gender differences might be more stable across generations and the behavior of this young generation might change as they grow older. A generational life stage model was proposed in which the level of use is explained by generational differences, but in which gender differences are explained by life stage. This paper was able to show that generation is neither the only nor the most important predictor of gender differences in internet use. Life stage (measured as employment and marital status) influenced the differences between men and women or had an independent effect for most of the online activities studied. Time is therefore unlikely to 'heal' all gender divides. Offline gender

roles influence online behavior like they do other behavior and this is likely to continue even when the current tech savvy generation grows older. Practical issues could underlie this effect of life stage. For example, shopping to support the family might be more important for women when they are in a stable relationship. Similarly, men might have sexual needs which are fulfilled when they are in a stable relationship and which they therefore do not need to seek online. The internet in this sense reflects the practical reality of offline life circumstances and online gender differences cannot be seen as separate from offline gender roles.

Furthermore, researchers will need to rethink the influence of generation. A curvilinear effect of generation was observed. Younger people and older people used the internet less for specific uses than middle-aged. This contradicts the linear effect that is often assumed between age and internet use. This could be due to the types of uses investigated in this paper which were adult in nature. The proposed generational life stage model might therefore be more appropriate for adult types of uses. The life stage model should be applied to analyses of newer applications to understand whether these gender differences vary in younger generations as well.

This paper offers support for the importance of life stage in influencing ICT use. Nevertheless, more research is needed to understand if the internet now serves, like housework traditionally served, as a platform on which gender relations are symbolically enacted.

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## Endnotes

<sup>1</sup> The OxIS databases were available for request at

<http://www.oii.ox.ac.uk/microsites/oxis/databases.cfm>

<sup>2</sup> The factor analysis also included information seeking and civic and political participation not represented as separate variables in this paper. A confirmatory factor analysis including the scale variables shows that the scale distinctions hold with a reasonable fit of  $\chi^2_{(131)}=920.08$ ,  $p < .00$ ; CFI=.92, RMSEA=.06 (c.i. .06-.07). For further details see Authors (2009).

Table 1 Sample descriptives

	<i>N</i>	%		<i>N</i>	%		<i>N</i>	%
Gender			Marital Status			Occupation		
Women	779	49%	Single	501	32%	Student	195	12%
Men	799	51%	Married	661	42%	Employed	1020	65%
Children	697	44%	Cohabiting	241	15%	Unemploye	74	5%
	<i>M</i>	<i>SD</i>	Divorced	139	9%	Retired	156	10%
Age	45.82	18.75	Widowed	32	2%	Caretaker	111	7%

Note. Base is weighted data for internet users ( $N = 1,578$ ). Table 1 shows the distribution of the sample. The measures which generated these categories are described below.

Table 2 Average online behavior of men and women

	Men			Women			$t_{(1576)}$	$\chi^2_1$
	<i>M</i>	<i>SD</i>	% <sup>a</sup>	<i>M</i>	<i>SD</i>	% <sup>a</sup>		
Breadth of Internet use(0 - 55)	20.44**	9.06		18.05**	8.51		5.40	
Sexual material (1-6)	1.41**	0.92	22%**	1.10**	0.45	6%**	8.71	84.06
Health information (1-6)	2.02**	1.01	64%**	2.23**	1.09	71%**	-4.00	8.09
Online shopping (1-6)	2.60**	0.85	94%	2.49**	0.82	93%	2.65	0.93
Online finance (1-6)	1.95**	1.00	60%	1.81**	0.88	56%	2.98	2.51
Online Social networking (0-4)	0.76**	1.12	40%**	0.55**	0.98	31%**	3.93	14.79
Online Personal communication (1-6)	2.80**	1.03	93%	2.58**	0.92	93%	4.36	0.06
Online Play (1-6)	1.76**	0.88	54%**	1.48**	0.77	39%**	6.63	40.00
Online Entertainment (1-6)	2.07**	1.05	69%**	1.73**	0.92	54%**	6.66	34.84
Online Leisure (1-6)	2.43	0.90	91%	2.37	0.87	91%	1.41	0.06

Base: Users of the internet ( $N = 1,578$ )

Note. Comparisons made between means (t-test) and between percentages ( $\chi^2$ ).

a. Percentage of internet users that undertakes at least one of the activities in this category.

\* Differences between men and women significant at  $p < .05$ .

\*\* Differences between men and women significant at  $p < .01$ .

Table 3 Stepwise moderated regression of breadth of use by gender, generation and life stage with interaction terms

		<i>B</i>	<i>SE</i>	<i>B</i>	<i>t</i>	<i>P</i>	<i>R</i> <sup>2</sup>
Step 1	(Constant)	21.70	0.80		27.05	0.00	
	Gender (Women)	1.36	1.10	0.08	1.23	0.22	0.02
Step 2	Generation	-1.75	0.42	-0.34	-4.19	0.00	
	Unemployed	-4.56	0.92	-0.12	-4.98	0.00	
	Retired	-5.15	0.83	-0.17	-6.23	0.00	0.10
	Divorced	-2.30	0.79	-0.08	-2.91	0.00	
	Married	-1.11	0.52	-0.06	-2.14	0.03	
Step 3	GenderXGeneration	0.89	0.25	0.35	3.58	0.00	0.11

Base: Users of the internet ( $N = 1,578$ )

Note I. Variables that were not significant at the step in which they were entered are not depicted in the table. Excluded variables were Student, Employed, Single, Cohabiting, Children and the interaction of Gender with all the Life stage variables.

Note II. Each step includes the variance explained of the variables in the equation on the corresponding and previous step ( $R^2$ ).

Table 4 Stepwise moderated regression of online sexual material, health and shopping activities

Step		<u>Sexual material</u>			<u>Health</u>			<u>Shopping</u>		
		<i>B</i>	$\beta$	$R^2$	<i>B</i>	$\beta$	$R^2$	<i>B</i>	$\beta$	$R^2$
1	(Constant)	1.64			1.63			2.12		
	Gender (Women)	-0.50	-0.34**	0.05	0.24	0.12**	0.01	-0.35	-0.21**	0.00
2	Generation							-0.15	-0.30**	
	Employed	0.15	0.10**		0.26	0.12**		0.29	0.17**	
	Unemployed			0.06			0.02	-0.20	-0.06*	0.05
	Cohabiting							0.23	0.10**	
	Married	0.16	0.11							
3	GenderXGeneration						See	0.08	0.33**	
	GenderXUnemployed	-0.10	-0.09*	0.07			step			0.07
	GenderXMarried	-0.22	-0.31**				2	0.07	0.09*	

Base: Users of the internet ( $N = 1,578$ )

Note I. Variables that were not significant at the step in which they were entered are not depicted in the table. Excluded variables were Single, Divorced, Student, Retired, and Children.

Note II. Each step includes the variance explained of the variables in the equation on the corresponding and previous step ( $R^2$ ).

\*\* Significant at  $p < .01$

\* Significant at  $p < .05$ .

Figure 1 Life stage and generation model of gendered internet use

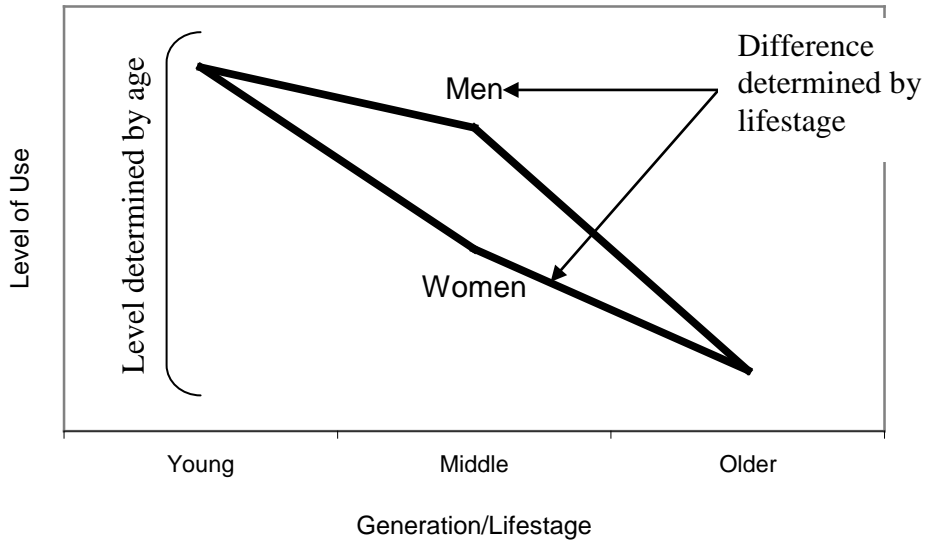
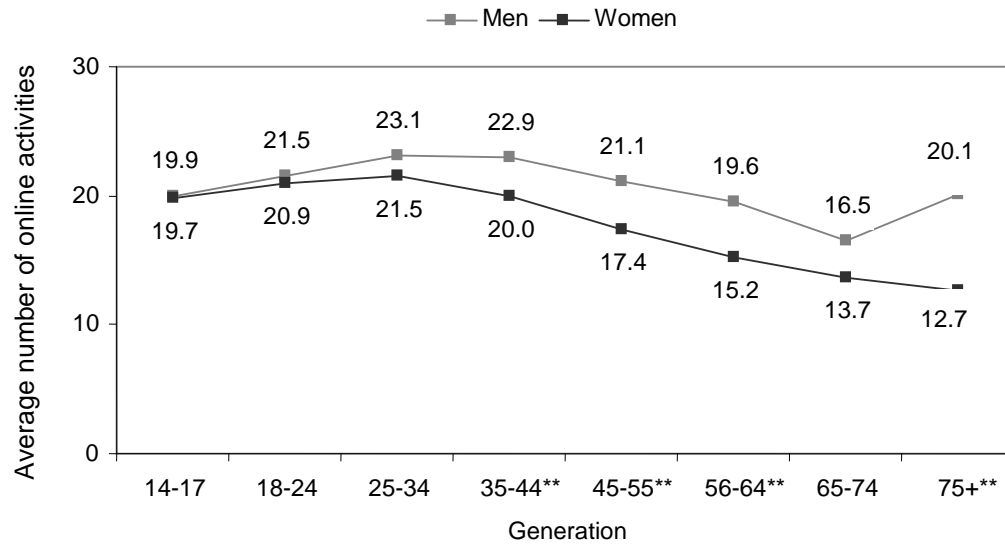


Figure 2 Interaction between generation and gender in breadth of use

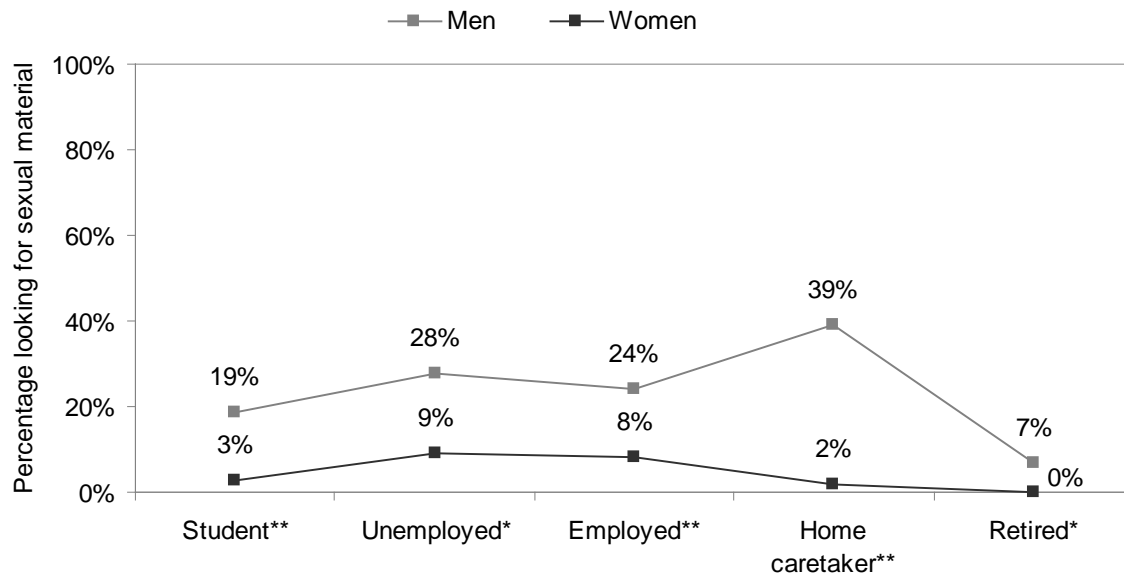


Base: Internet Users ( $N=1,578$ )

\*\* Differences between men and women significant at  $p < .01$



Figure 3 Looking for sexual material by gender and life stage (occupation)



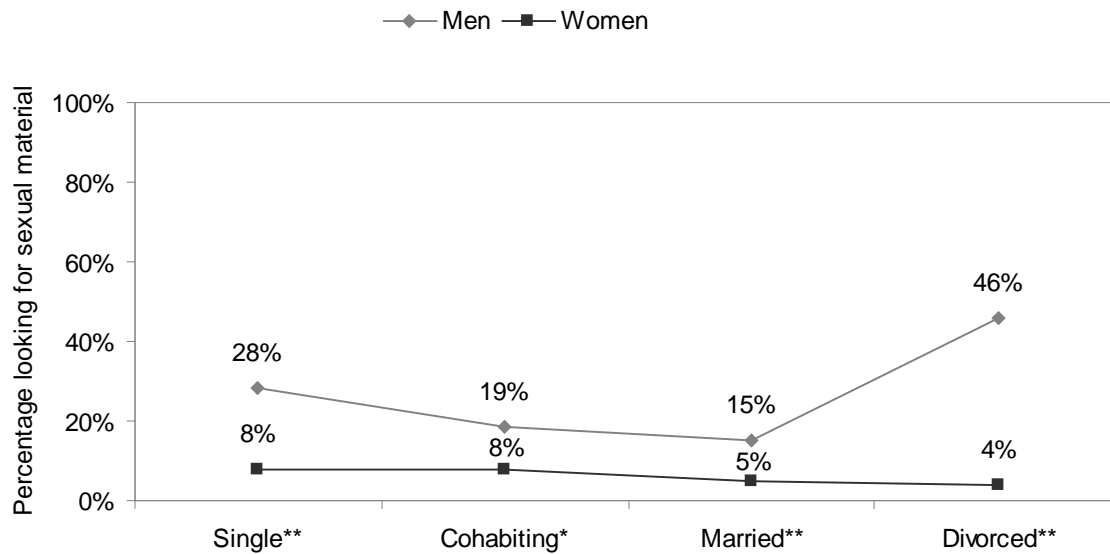
Base: Internet Users ( $N=1,578$ )

\* Differences between men and women significant at  $p < .05$

\*\* Differences between men and women significant at  $p < .01$

Note. Figure 4 depicts the percentage of people who looked at 'adult sites' once a month or more. The regressions were performed using the frequency scale from 1 'Never' to 6 'Several times per day'. The results were similar for both average frequency and percentage distributions between men and women but are graphically clearer when using the percentages of men and women within the different groups.

Figure 4 Looking for sexual material by gender and life stage (marital status)



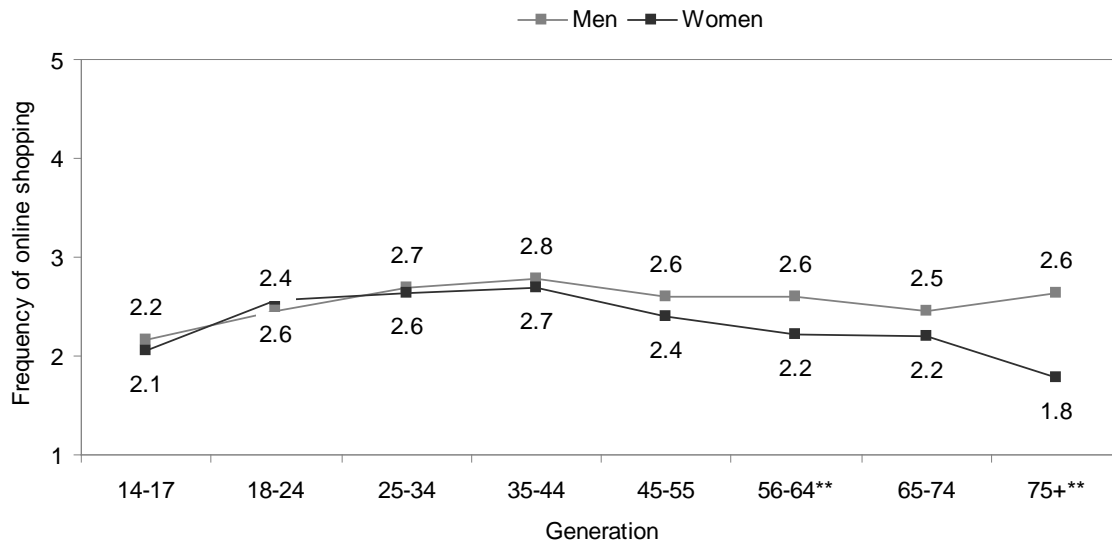
Base: Internet Users ( $N=1,578$ )

\* Differences between men and women significant at  $p < .05$

\*\* Differences between men and women significant at  $p < .01$

Note. While the regressions were performed using the frequency scale from 1 'Never' to 6 'Several times per day', Figure 5 depicts the percentage of people who looked at 'adult sites' once a month or more. The results were similar in terms of the differences between men and women but are graphically clearer when using the percentages of men and women within the different groups.

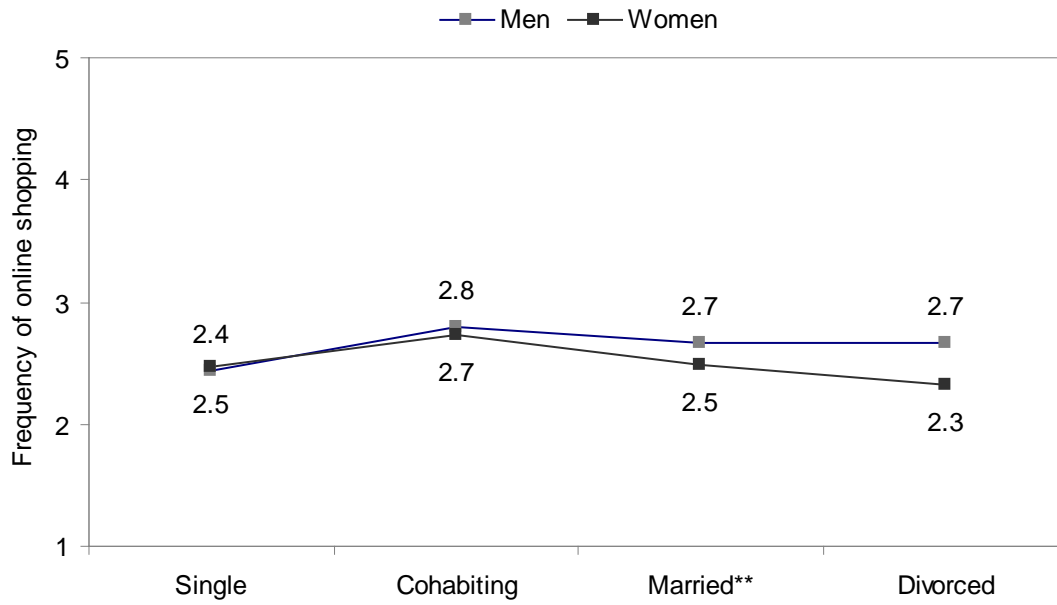
Figure 5 Shopping by gender and generation



Base: Internet Users ( $N=1,578$ )

\*\* Differences between men and women significant at  $p < .01$

Figure 6 Shopping by gender and life stage (marital status)



Base: Internet Users ( $N=1,578$ )

\*\* Differences between men and women significant at  $p < .01$