Does the wind of change blow in late adulthood? Adoption of ICT by senior citizens during the past decade

Sabina Lissitsa a,*, Svetlana Chachashvili-Bolotin b

a School of Communication, Ariel University, Israel
b Immigration Institute, Ruppin Academic Center, Israel

ARTICLE INFO

Article history:
Received 10 December 2014
Received in revised form 16 June 2015
Accepted 19 June 2015

Keywords:
Digital divide
Senior population
Capital-enhancing internet use
Repeated cross-sectional study
Ethnicity

ABSTRACT

Using data from large scale Annual Social Surveys of the CBS in Israel, the current research focused on trends of internet adoption and digital uses among the senior population in the past decade (2003–2012). The research goal was to identify the socio-demographic characteristics predicting internet access and digital uses and to examine whether the effects of these factors changed over time. During the decade the rate of internet access and digital uses increased continuously among the senior population, however the gap between them and the younger (20–64) age group was not eliminated; in fact it increased but only slightly. Our findings make it possible to identify disadvantaged groups in which being a senior intersects with additional risk factors: Arabs, immigrants, religious people, respondents from low socio-economic background and people with health problems. These findings are important for policy makers who attempt to promote internet use among Israeli older adults. Focusing on disadvantaged groups and implementing our specific recommendations may have beneficial effects.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

The dramatic rise in internet connectivity and usage in the past decade has opened new avenues for obtaining information, creating economic and social exchanges and engaging in social activities more
easily. The down side of this digital proliferation has been a digital divide between those who have access to information and communication technologies and the ability utilize them, and those who do not (Compaine, 2001).

The shift in terminology from “digital divide” (implying a binary vision of digitalization processes) to terms such as “digital inclusion/exclusion”, “digital inequality” (DiMaggio & Hargittai, 2001; Hargittai, 2003) and “e-inclusion/exclusion” (Riga Ministerial Declaration, 2006) reflects the change of perspective. The digital divide is not merely a technological problem; it is also a social problem with the potential for creating societal inequalities (Fuchs, 2009, Guerrieri & Bentivegna, 2011). The ability to use such technologies can determine an individual’s marginality or social inclusion. Those who are excluded from communication and information structures are also effectively excluded from political and cultural citizenship (Lash, 1994).

Access to technology and its benefits is not equally distributed between or within nations (Guerrieri & Bentivegna, 2011), and in all Western countries, and indeed, the world, older people tend to be on the ‘wrong’ side of the digital divide (Brenner & Smith, 2013; Olphert & Damodaran, 2013; Smith, 2014; Zickuhr, 2013). The age gap among internet users appears to be changing more slowly than other aspects of the digital divide (Guerrieri & Bentivegna, 2011; Klotz, 2004). Moreover, citizens older than 60 can be identified as the social group with the lowest level of participation in the information society (Fuglsang, 2005). In the UK in 2007, “90% of those in the 16–24 age group had accessed the internet in the three months prior to the survey, whereas only 24% of those aged 65 and over had” (National Statistics UK, 2007). The European Digital Development Index (EDDI) value for the 65–74 years age bracket is constantly below the European average and shows no sign of improvement (Guerrieri & Bentivegna, 2011). In the US, while internet adoption rates among seniors are steadily increasing, they are still well below the national average (59% of seniors used internet in 2012, compared to 81% among all adults aged 18+) (Smith, 2014).

However, Abbey and Hyde (2009) note that despite the dominant trend in the research literature to perceive age as a powerful basis for the digital divide, some commentators predict that with time this divide will repair itself. While this may be correct, in our view it is important not to wait for the problem to cure itself. Rather a deeper understanding is necessary of how the newly retired have adopted new technologies in recent years. The average age of retirement in Israel is 65; considering the substantial increases in life expectancies, a 65-year-old person today may expect to live an additional 18.6 years (Greenberg, 2009) and it is important to ensure quality of life for the aging population, which in our time is inextricably linked with internet adoption and use (Shapira, Barak, & Gal, 2007).

The main purpose of the current study is to follow the trends in ICT adoption among the Israeli population aged 65 and older during the decade 2003–2012 and to identify variations in the socio-demographic characteristics that predict internet access and digital uses over time.

2. Theoretical background

2.1. Digital uses

Today, it is customary to separate the digital divide into two levels of inequality: the first distinguishes between those who are connected and those who are not. The second pertains to the surfing patterns used by those connected to the internet, including measurements of different types of internet uses (DiMaggio & Hargittai, 2001; Hargittai, 2003). In recent years, the digital divide has increasingly been framed as a skill divide (e.g., Hargittai, 2010; Robinson, DiMaggio, & Hargittai, 2003; van Deursen & van Dijk, 2011; Van Dijk, 2005). Van Deursen, Courtois, and Van Dijk (2014) conceptualized the process of acquiring internet skills as gradual, starting with operational and formal skills that evolve into more established information and communication skills and reach completion when users attain strategic skills.

In the current research we investigate patterns of digital uses, which are obviously impacted by digital skills, but do not fully correspond to them. Different patterns of internet use, which are impacted by digital skills, among other factors, influence the life chances of users: the more capital they can accumulate using the internet, the more they can benefit from web use (Zillien & Hargittai, 2009).

Some internet usage activities are more beneficial or advantageous for users – offering them greater opportunities and resources for advancing their careers, work, education and social status
In the current study we investigate the first type of digital uses, which includes human capital-enhancing forms of internet use and social capital-enhancing forms of internet use (Lissitsa & Chachashvili-Bolotin, 2014). Human capital-enhancing uses refer to internet surfing for beneficial purposes, including seeking health information, researching products, current events, etc. (Hargittai & Hinnant, 2008; Hassani, 2006). Social capital-enhancing digital uses refer to the ability to communicate with other people by e-mail and social media. The social media create a platform for communications among a dynamic consortium of people utilizing social network sites, forums, discussion groups and blogs in a manner that enables individuals with a common interest to interact continually and to promote different types of benefits (Boyd & Ellison, 2007; Haenlein & Kaplan, 2010).

2.2. Internet adoption among the older population

It is generally acknowledged that older users often face more difficulties and barriers than younger people in learning and using new technologies. Impediments may arise for a variety of reasons and several theories have been formulated to explain them. For example, socio-emotional selectivity theory can explain the psychological basis of later internet adoption and limited internet uses among senior population. According to this theory, as people move through life they become increasingly aware that time is in some sense “running out.” It becomes increasingly important to make the “right” choice, not to waste time on unpleasant and stressful activities and to spend time with social partners who are most likely to provide a social climate in which they feel validated and loved (Carstensen & Isaacowitz, 1999). Interest in novel information is reduced because exposure to unpleasant information as well as interacting with anonymous people in a new media may subject the elderly to emotional risks (Carstensen & Isaacowitz, 1999). This makes the adoption of digital skills in old age a possibly stressful and unpleasant experience that can impair emotional quality of life. Accordingly, a number of investigations have empirically demonstrated that older adults are more anxious and less confident in internet use, and such negative psychological factors affect their decisions with respect to internet adoption and use (Chou, 2003; Joiner et al., 2005).

Another explanation of the age-based digital divide is the extent of homophily/heterophily of social networks. Rogers (2003, p. 307) presents homophily as a barrier to diffusion, arguing that where homophily is strong, adoption of innovations is more likely to be limited to elites. DiMaggio and Garip (2011) applied these insights to the system level to contend that homophily tends to increase intergroup inequality, whereas heterophily tends to reduce it. According this theory, younger people with more heterogeneous and constantly expanding social networks are more likely to use ICT, compared to seniors. With age, seniors experience a contraction of their regular social networks and support group (Butler, Lewis, & Sunderland, 1998; Shapira et al., 2007) and as a result have more homogeneous social networks which make them gravitate away from new social circles.

Besides these psychological and social factors, aging is often accompanied by various physical problems including deteriorating health and cognitive functioning (Butler et al., 1998; Shapira et al., 2007), leading to greater dependency on others (Cox, 1988). Investigators have found that cognitive abilities such as memory and speed of information processing are important to successful performance of technology-based tasks (Czaja et al., 2006; Freese, Rivas, & Hargittai, 2006; Sharit et al., 2004). As a result, seniors often commit more user errors, require more assistance, and need additional time to accomplish assigned tasks (Lee, Chen, & Hewitt, 2011; Pan & Jordan-Marsh, 2010). Furthermore, as most older persons have at least one chronic condition, and often multiple health-related conditions (Greenberg, 2009; Smith, 2014), they will likely have more difficulties in using computer-mediated technologies before they can fully enjoy the benefits (Gell, Rosenberg, Demiris, LaCroix, & Patel, 2013; Lagana, 2008). For example, visual impairments can make reading a computer screen more difficult (Bitterman & Shalev, 2004) and dexterity problems make tasks like typing and mouse operation more difficult to perform (Charness & Holley, 2004). Collectively, these factors may contribute to more subliminal negative stereotypes that may jeopardize their learning performance in dealing with new technologies (Lamont, Swift, & Abrams, 2015).
It is important to overcome these difficulties because using the internet for communication may help reduce social isolation, loneliness, and depression among older adults (Blit-Cohen & Litwin, 2004; Cotton, Ford, Ford, & Hale, 2012; Gell et al., 2013; Nimrod, 2014; Olphert & Damodaran, 2013). Computer-mediated information technology may help older adults enhance communication with their family members and friends, expand opportunities for lifelong learning (Freese et al., 2006), widen their social support networks (White et al., 2002), enrich their personal interests and health-related information, and explore additional resources for entertainment (Khvorostianov, Elias, & Nimrod, 2012; Mc Mellon & Schiffman, 2000; Nimrod, 2014; O’Hara, 2004). In these ways the use of computers and the internet can empower older people, contribute to their quality of life and help them to cope with mental and physical difficulties typical of their age (Shapira et al., 2007).

2.3. Internet use among the older Israeli population

In 2012 the population of Israeli citizens aged 65+ numbered 814.2 thousand people from among almost 9 million Israelis. According to statistical prognoses, in 2025 the senior population (aged 65+) will grow to 1.2 million people and constitute 13% of the Israeli population.

Surveys indicate a consistent growth in the percentage of older adults adopting internet but the aged based digital divide is one of the most noticeable in Israel (Lissitsa & Lev-On, 2014). While the senior population is characterized by one of the lowest levels of internet adoption in the country, it is also the population segment that is growing most rapidly.

In order to involve the senior population in ICT use several projects have targeted this population segment. In one, students visit nursing homes and residential facilities and teach seniors computer skills as a part of the “Israeli propaganda online project”. As part of multigenerational programs conducted in about 250 schools by the Ministry of Education since 2000, retirees attend schools where they acquire computer and internet skills from students. In addition, senior citizens can learn how to use computers and internet in clubs and day centers for the elderly from peers who have succeeded in acquiring digital skills (“The computer for all ages” project) (Knesset, 2006).

Over time, user- and content-friendly websites for the senior population have proliferated. For example, the Israeli portal “Motk’e” (in Hebrew) was created especially for the older population and offers options to participate in forums, write blogs, play games and obtain information on pertinent issues such as health, leisure, current events, cultural events, food, recipes and dating. The well planned interface allows users to increase font size, offers many pictures and in general facilitates surfing by people with health disabilities. However, this portal is inaccessible to relatively large segments of the senior citizenry in Israel with low Hebrew proficiency, such as Arabs and immigrants.

2.4. Factors affecting internet access and digital uses

Studies indicate that the same variables that are responsible for creating gaps in internet access also explain differences in digital uses (DiMaggio & Hargittai, 2001; van Deursen & van Dijk, 2010). These include demographic background variables: gender (Cooper, 2006; Taipale, 2012), age (Darnton, 2006; Dutton & Blank, 2011; Losh, 2010), ethnic origin (Lissitsa & Chachashvili-Bolotin, 2014; Dupagne & Swalden, 2005; Fairlie, 2007; Greenstein & Prince, 2006), level of religiosity (Campbell, 2005a, 2005b; Ess, Kawabata, & Kurosaki, 2007), area of domicile (LaRose, Gregg, Strover, Straubhaar, & Carpenter, 2007; Mossberger, Tolbert, Bowen, & Jimenez, 2012) and socio-economic variables, such as education (DiMaggio & Bonikowski, 2008; DiMaggio et al., 2004), language proficiency (Lissitsa & Chachashvili-Bolotin, 2014; Fairlie, 2007; Williams, 2013) and income (Hargittai & Hinnant, 2008; Losh, 2010; Mesh & Talmud, 2011).

Religiosity is a highly important aspect of the Israeli social fabric, especially among the Jewish population. Degrees of religiosity are associated with degrees of adherence to and observance of religious laws. Each level is marked by its own cultural lifestyle, social and ecological isolation, and degrees of commitment to the national cultural center (Katz-Gerro, Raz, & Yaish, 2008). Israeli studies

The findings among older adults show that higher internet access and use are associated with male gender, younger age, being married, higher educational level and income (Carpenter & Buday, 2007; Elliot, Mooney, Douthit, & Lynch, 2013; Gell et al., 2013). Researchers suggest that the impact of health disabilities and physical constraints on ICT adoption and use among older citizens should be taken into consideration (Gell et al., 2013; Lee et al., 2011).

The expansion of internet into all areas of modern life, the growth in the elderly population and the contribution of digital uses to the quality of life of the senior population, increase the importance of a comprehensive study of internet adoption and use. Consequently, a few panel studies in US have analyzed internet use among senior citizens (see Elliot et al., 2013; Smith, 2014; Zickuhr & Madden, 2012).

However, as far as we know, no research using a large senior population has been conducted that investigates trends in the impact of socio-demographic variables on internet adoption over the past decade. This is the purview of the current research.

3. Research questions

1. What trends in internet access and digital uses emerged during the decade from 2003 to 2012 among Israeli citizens aged 65+, compared to a younger age group?
2. Which variables may predict internet access and digital uses among Israeli citizens aged 65+, compared to a younger age group?
3. What changes, if any, were observed over time in patterns of predictability of the effects of socio-demographic variables on internet access and digital uses among Israeli citizens in both age groups?

4. Methods

4.1. Source of data

The current research is based on a repeated cross-sectional study. The study data were collected under the auspices of the Annual Social Surveys conducted by the Israel's Central Bureau of Statistics (CBS) in the period between 2003 and 2012. The CBS conducts a social survey annually using different respondents each year. The surveys provide up-to-date information about living conditions and the welfare of the population in Israel. The formulation of all the questions used in the study was identical throughout the decade.

CBS interviewers carried out face to face interviews in the field between January and December of each year. The duration of each of the interviews, which were conducted in Hebrew, Russian and Arabic, was about 1 h.

4.2. Population and sampling method

The survey pool population comprises the permanent non-institutional population of Israel aged 20 and older, as well as residents of non-custodial institutions (such as student dormitories, immigrant absorption centers and independent living projects for the elderly). New immigrants are included in the survey population if they have been resident in Israel for at least six months.

Each year the CBS sample size was about 7500 persons aged 20 and older, representing about 4.5 million people in that age bracket. The response rate was around 80%. The sample design involved defining groups based on a combination of three demographic variables: population groups (Israeli-born Jews, immigrants and Arabs), age and gender. The expected size of each design group was to be proportional to its size in the population. The social survey samples are based on random selection and the sampling method enables generalization of the results to the entire Israeli population.
Our total sample, which combined interviews made over 10 years, included 73,523 respondents, among them 12,068 respondents aged 65+. The socio-demographic characteristics of the sample are presented in Appendix A.

4.3. Variables

4.3.1. Independent variables

Ethnicity was measured by two dichotomous variables: Arabs and immigrants (those who immigrated to Israel after 1989). Veteran Jews (born in Israel or immigrated before 1989) were the comparison group.

Gender was coded 1 for men and 0 for women.

Age was measured in five-year categories. This variable was transformed into a continuous variable using the midpoint of each group.

Religiosity was measured on a scale of 1–4: 1 – Not religious, secular; 2 – Traditional; 3 – Religious, 4 – Very religious.

Marital status was measured as a dichotomous variable: 1 – married; 0 – other marital status.

Number of children was measured as a continuous variable.

Area of residence was coded 1 for center residents (Jerusalem, Tel-Aviv, and Central region) and 0 for periphery residents (North, Haifa, South, Judea, and Samaria).

Education was measured by a highest diploma received by the respondent (see Appendix Table 1). This variable was transformed into three dichotomous variables: Matriculation eligibility, Non-academic tertiary education and Academic tertiary education. The comparison group was Elementary and Secondary education.

Employment was measured as a dichotomous variable: 1 – works, 0 – does not work.

Income level was measured by the item: Last month, what was the total gross income of all members of the household, from all sources: work, pensions, support payments, rents, etc.? on a scale of: 1. NIS 2500 (New Israeli Shekels) or less; 2. NIS 2501–4000; 3. NIS 4001–5000; 4. NIS 5001–6500; 5. NIS 6501–8000; 6. NIS 8001–10,000; 7. NIS 10,001–13,000; 8. NIS 13,001–17,000; 9. NIS 17,001–24,000. 10. NIS More than 24,000. This variable was transformed into a continuous variable using the midpoint of each group and divided by 1000. The top income category was recorded as NIS 30,000.

Hebrew language proficiency. The respondents were asked: What is the level of your knowledge of the Hebrew language, in speech, reading and writing? The scale was 1 – very good, 2 – good, 3 – moderate, 4 – weak, 5 – do not know at all. A combined index for reading, writing and speaking skills in Hebrew was measured on a scale of 1–5 (1 – Not at all, 5 – Very well) which was constructed as the average of these three language skills. Cronbach Alpha for Proficiency in Hebrew language was .95.

4.3.2. Dependent variables

Using the internet in the last three months was measured by the following item: During the last three months, have you made use of the internet, including e-mail? Internet access was coded as 1 for those who used and 0 for non-users.

Human capital-enhancing forms of internet use were measured by the following item: Did you use a computer during the last three months for seeking information; e.g., bank account, news, seeking information about people?

Social capital-enhancing forms of internet use were measured by the following two items: Did you use a computer during the last three months (a) for e-mail? (b) for discussion groups and communications, e.g., chat rooms, forums, Messenger, Skype? (Facebook has been included in the question about social media use since 2010; Twitter since 2012). In each item, users were coded as 1 and non-users as 0. Descriptive results for different forms of internet use are presented in the Appendix B.

4.3.3. Building measures for social capital-enhancing forms of internet use

As the original variables (e-mail usage and social media usage) were measured on a dichotomous scale (0 – does not use, 1 – uses), the scale for measuring social capital-enhancing forms of internet use
ranges from 0 to 2 (0 – does not employ any of the uses; 1 – employs only one type of social uses; 2 – employs both types of social uses).

4.3.4. Control variables

Wave of data collection was coded on a scale of 0–9, where 2003=0, 2012=9.

Physical or health problems interfering with day-to-day functioning were measured on scale of 1–5, 1 – do not have physical or health problem, 2 – the problem doesn't interfere at all, 3 – the problem doesn't interfere very much, 4 – the problem interferes, 5- the problem interferes greatly.

5. Results

We will first present the findings regarding internet access and use over time and then apply multivariate analysis in order to predict internet access and digital uses. In predicting digital uses, we focused only on the group of internet users, excluding all non-users.

5.1. Descriptive findings

5.1.1. Internet access over time

Fig. 1 shows the percentage of internet access for both groups and for the total sample. Fig. 1 shows that internet access among the senior population rose from 8% in 2003 to 34% in 2012 (an increase of 26 percentage points). At the same time, the percentage of internet adopters among the 20–64 age group rose from 44% to 78% (an increase of 34 percentage points). Thus, the absolute gap between senior citizens (65+) and the population aged 20–64 increased. However, the odds ratio was more pronounced for the seniors (5.8), than for the younger age group (4.6) as a result of the very low starting point among the seniors.

\[
\begin{array}{cccccccccccc}
20-64 & 44\% & 50\% & 55\% & 59\% & 65\% & 67\% & 71\% & 75\% & 78\% & 78\% & 34\% & 4.6 \\
65+ & 8\% & 8\% & 13\% & 15\% & 19\% & 20\% & 25\% & 30\% & 33\% & 34\% & 26\% & 5.8 \\
Total sample & 38\% & 44\% & 48\% & 51\% & 58\% & 59\% & 63\% & 68\% & 70\% & 71\% & 32\% & 3.9 \\
\end{array}
\]

Fig. 1. Using the internet in the last three months between 2003 and 2012.
Fig. 2 presents the rates of internet use for seeking information in the total sample. The percentage of internet uses among internet users is presented in the Appendix B.

Fig. 2 shows that information seeking among the senior population rose from 8% in 2003 to 32% in 2012 (an increase of 24 percentage points). This digital use among sample participants aged 20–64 rose from 41% to 75% (an increase of 34 percentage points). Despite the more pronounced odds ratio for the seniors (5.8) than for the younger age group (4.3), the absolute gap between these two groups actually increased in favor of the 20–64 age group (from 33% in 2003 to 43% in 2012). Comparing Figs. 1 and 2 we can see that the percentage of internet use for information seeking is only slightly lower than the access rate.

Fig. 3 shows that e-mail usage among the senior population rose from 7% in 2003 to 28% in 2012 (an increase of 21 percentage points) while the access rate among those aged 20–64 rose from 35% to 68% (an increase of 33 percentage points). The odds ratio was more pronounced for the seniors (5.3) than for the younger age group (4.1). Comparing Figs. 1 and 3 we can see that the percentage of internet use for e-mail among the senior population is only slightly lower than the access rate (Fig. 1).

The starting point of social media use was low – only 1% of those age 65+ used social media in 2003, compared to 10% percent among those age 20–64 (Fig. 4). During the decade the gap between the groups increased: 18% of senior citizens used social media in 2012, compared to 52% among the 20–64 age group. The change in social media use during the decade among the senior population was much lower (17 percentage points), compared to 42 percentage points in the younger group. The odds ratio was much more pronounced for the seniors (23.8) than for the younger age group (10.1).

5.2. Multivariate analyses

5.2.1. Predicting internet use

In order to compare between the two age groups, separate analyses were performed for the 20–64 and 65+ groups. A logistic regression was performed in three stages. In the first stage the wave of data collection, dichotomous ethnic variables and gender were entered. In the second stage background and control variables were added. In order to identify changes in the effects of socio-demographic
variables over time in the third stage we added the interactions between wave of data collection and background variables with the most powerful effect on internet use, according to the research literature: gender, ethnicity (Arabs and immigrants), religiosity, Hebrew language proficiency, education, income and physical or health problems.\(^1\) Our final regression model includes only the significant interactional effects at least in one of the age groups.

The findings for the senior citizens will be presented first, after which differences between them and the younger age group will be summarized.

The findings among seniors. As can be seen from Table 1, Model 1, the odds of using vs. not using internet in the preceding three months increased over time. The odds of using vs. not using the internet among Arabs and immigrants were lower compared to veteran Jews. The odds of using vs. not using the internet in the preceding three months were higher among males, compared to females. After controlling for background and control variables the disadvantage of immigrants and Arabs, compared to the veteran Jews diminished but remained significant (see Model 2). The odds of using vs. not using the internet in the preceding three months were higher among married respondents and employed respondents. The higher were educational level, Hebrew proficiency and family income, the higher were the odds of using vs. not using the internet. The lower were the age, the level of religiosity and the less physical or health problems interfered with day-to-day functioning, the higher were the odds of using vs. not using the internet. The effects of locality and the number of children on the odds of using vs. not using the internet were insignificant.

As can be seen from Model 3 the positive interaction between immigrants and the wave of data collection indicates that the effect of time is stronger among immigrants than among veteran Jews. When considering the amplitude of effects of these variables we can conclude that in 2012, the odds of using vs. not using the internet among immigrants were similar to those of veteran Jews, when

\(^{1}\) For similar methodology in repeated cross-sectional as well as panel studies see Amir, Taylor, and Donohue (2011); Dunford, Shipp, Boss, Angermeier, and Boss (2012); Semyonov and Lewin-Epstein (2009).
controlling for socio-demographic variables. The negative interactional effect between matriculation eligibility and wave of data collection indicates that over time the differences between respondents with matriculation eligibility and those with lower educational level diminished. The insignificant effects of the interaction between wave of data collection and Arabs, gender, Hebrew proficiency, family income, religiosity and health problems indicate that the effects of these variables did not change over time.

Differences between age groups. The main differences between the groups were found in the interactional effects: in the younger age group the change rates among females were higher, compared to males, whereas among seniors the patterns of internet adoption over the time were similar between both genders. In the younger age group, the disadvantage of Arabs compared to veteran Jews diminished over time, whereas among seniors between-group differences were stable over time. In addition, in the younger group the effects of religiosity and family income became stronger over time, whereas among seniors these effects did not change. In the younger group the effect of Hebrew proficiency became stronger over time, while among seniors this effect was stable.

Comparing the quality measures of the models in both groups it should be noted that in the 20–64 age group, socio-demographic variables explain about 50% of the variance for the internet use variable but only about 43% among those aged 65+.

5.2.2. Predicting human and social capital-enhancing forms of internet use

In order to predict the two types of digital uses (human and social capital-enhancing forms of internet use), logistic and ordinal regressions were conducted in stages. The independent variables were introduced to these models as in the logistic regression described above. These regressions analyzed only internet users.2

---

2 Due to the small number of Arab Internet users aged 65+ (N=16), comprising only 1.8% of this group, Arabs were not included in the further multivariate analyses.
5.2.2.1. Predicting human capital-enhancing forms of internet use. Findings among seniors. As can be seen from Table 2, Model 1, the odds of using the internet in human capital-enhancing ways increased over time. Among internet users, the difference between immigrants and veteran Jews in human capital-enhancing forms of internet use was insignificant. The odds of using the internet in human capital-enhancing ways were higher among males. As can be seen in Model 2, this difference did not change after controlling for socio-demographic variables. The higher was the level of religiosity, the lower were the odds of using the internet in human capital-enhancing ways. The effects of other socio-demographic variables on the odds of human capital-enhancing uses were insignificant.

Differences between age groups. In the younger age group a positive effect was found for Hebrew language proficiency, education, family income and marital status, and a negative effect was found for age and number of children, whereas among seniors the effects of these variables were insignificant.

### Table 1
Logistic regression model: internet use in the last three months.

<table>
<thead>
<tr>
<th></th>
<th>Aged 20–64</th>
<th>Aged 65+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Exp (B)B</td>
</tr>
<tr>
<td>The wave of data</td>
<td>0.23** 1.26</td>
<td>0.28** 1.33</td>
</tr>
<tr>
<td>collection (WDC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity (comparison to veteran Israelis)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immigrants</td>
<td>-0.42* 0.66</td>
<td>-0.09 0.91</td>
</tr>
<tr>
<td>Arabs</td>
<td>-1.40* 0.25</td>
<td>-0.82* 0.44</td>
</tr>
<tr>
<td>Gender (male=1)</td>
<td>0.32 1.38</td>
<td>0.34 1.40</td>
</tr>
<tr>
<td>Locality (Center=1)</td>
<td>0.09 1.10</td>
<td>0.10 1.10</td>
</tr>
<tr>
<td>Family income</td>
<td>0.08 1.09</td>
<td>0.07 1.08</td>
</tr>
<tr>
<td>Religiosity</td>
<td>-0.60* 0.55</td>
<td>-0.50 0.61</td>
</tr>
<tr>
<td>Education (comparison to elementary+secondary)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matriculation eligibility</td>
<td>1.03 2.80</td>
<td>1.04 2.83</td>
</tr>
<tr>
<td>Non-academic tertiary education</td>
<td>1.07 2.93</td>
<td>1.21 3.36</td>
</tr>
<tr>
<td>Academic tertiary education</td>
<td>2.09 8.11</td>
<td>2.04 7.71</td>
</tr>
<tr>
<td>Number of children</td>
<td>-0.10* 0.90</td>
<td>-0.10* 0.91</td>
</tr>
<tr>
<td>Employment (employed = 1)</td>
<td>0.28 1.32</td>
<td>0.28 1.32</td>
</tr>
<tr>
<td>Marital status (married=1)</td>
<td>-0.19 0.83</td>
<td>-0.19 0.83</td>
</tr>
<tr>
<td>Hebrew language proficiency</td>
<td>0.53 1.71</td>
<td>0.44 1.56</td>
</tr>
<tr>
<td>Physical or health problems</td>
<td>-0.07 0.93</td>
<td>-0.07 0.93</td>
</tr>
<tr>
<td>Age</td>
<td>-0.04 0.96</td>
<td>-0.04 0.96</td>
</tr>
<tr>
<td>Gender * WDC</td>
<td>-0.04 0.96</td>
<td></td>
</tr>
<tr>
<td>Arabs * WDC</td>
<td>0.11 1.12</td>
<td></td>
</tr>
<tr>
<td>Immigrants * WDC</td>
<td>0.09 1.09</td>
<td></td>
</tr>
<tr>
<td>Religiosity * WDC</td>
<td>-0.03 0.97</td>
<td></td>
</tr>
<tr>
<td>Matriculation eligibility * WDC</td>
<td>0.00 1.00</td>
<td></td>
</tr>
<tr>
<td>Non–academic tertiary educ. * WDC</td>
<td>-0.04 0.97</td>
<td></td>
</tr>
<tr>
<td>Academic tertiary education * WDC</td>
<td>0.02 1.02</td>
<td></td>
</tr>
<tr>
<td>Family income * WDC</td>
<td>0.00 1.00</td>
<td></td>
</tr>
<tr>
<td>Hebrew proficiency * WDC</td>
<td>0.03 1.03</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.03 1.21</td>
<td>-1.33 0.26</td>
</tr>
<tr>
<td>Cox &amp; Snell R square</td>
<td>0.12 0.36</td>
<td>0.36 0.36</td>
</tr>
<tr>
<td>Nagelkerke R square</td>
<td>0.16 0.50</td>
<td>0.50 0.50</td>
</tr>
</tbody>
</table>

*p < .05.

*p < .01.
It is important to note that the quality measures of the model in the sample of internet users were only about 7% and 5% in both groups (compared to 50% and 43% respectively for predicting internet use in the 20–64 and 65+ age groups). This may be a result of a self-selection process among internet adopters compared to the general population. In other words, the main selection on the basis of socio-demographic characteristics occurs in the first level digital divide, whereas among internet users the distinguishing ability of these characteristics is much lower, especially among seniors.

5.2.2.2. Predicting social capital-enhancing forms of internet use. Findings among seniors. As can be seen from Table 3, Model 1, the odds of using the internet in social capital-enhancing ways increased over time. There is no significant gender difference in this type of internet use. Veteran Jews were less likely to use the internet in social capital-enhancing ways compared to immigrants. However, as can be seen from Model 2, after controlling for socio-demographic variables this difference was eliminated. The lower the age, Hebrew proficiency and religiosity, the higher were the odds of using the internet in social capital-enhancing ways (see Model 2). The respondents with elementary or secondary education were less likely to engage in social capital-enhancing digital uses, compared to those with higher educational levels. The effects of other socio-demographic variables on the odds of social capital-enhancing uses were insignificant. In addition no significant interactional effects were found between wave of data collection and socio-demographic variables, i.e., the effects of the socio-demographic variables were stable over time.

Differences between age groups. In the younger age group, males, center residents, and non-married respondents were more likely to be social internet users, compared to females, periphery residents and married respondents, whereas among seniors these differences were insignificant. In the 20–64 age group a positive effect was found for income and a negative effect was found for number of children, whereas among the seniors the effect of these variables was insignificant. It should be noted that the effect of Hebrew proficiency was positive in the younger age group and negative among the seniors. In addition, in the younger age group the advantage of immigrants, compared to veteran Jews,
remained significant, whereas among seniors between-group differences became insignificant after controlling for socio-demographic variables.

In studying quality measures of the model it can be seen that the socio-demographic variables explained about 25% of the variance of the dependent variable in the younger age group and only about 13% among the seniors.

### 6. Discussion

The population aged 65+ is defined as one of the main risk groups in ICT adoption (Guerrieri & Bentivegna, 2011). The current research focused on trends of internet adoption and digital uses among the senior population in the past decade (2003–2012) in order to identify the socio-demographic characteristics predicting internet access and digital uses. It was the first study to examine whether the effects of these factors changed over time.

According to our findings, in the period of 2003–2012 the percentage of internet access and digital uses increased continuously in the senior population and the odds ratio was higher among seniors, compared to the 20–64 age group. However, during the decade under study not only was the absolute gap between the groups not eliminated, but in fact it increased slightly. It should also be noted that the gap between the two age groups might in reality be higher due to the positive self-selection in the older age group – only those who were mentally and physically capable of participating in the 1-h face-to-face CBS surveys were included in the sample.

Our study investigated two types of capital-enhancing digital uses: human capital and social capital. According to the research literature capital-enhancing digital uses offer people greater opportunities and resources for advancing their careers, work, education and social status. The
majority of the population aged 65+ is retired; therefore career advancement and mobility in the labor market are less relevant for them. Preserving cognitive ability, the ability to absorb new information, lifelong learning and exposure to current events are very important for the overall well-being of senior citizens (Freese et al., 2006; Shapira et al., 2007). In this context it can be presumed that among the senior population human capital promotes the additional purpose of maintaining full functioning in life. Therefore the concept of human capital can be broadened in this age.

As for the human capital-enhancing uses as defined in the literature (seeking information) it should be noted that almost all of the internet users surfed the internet to seek information. Similar trends were found in e-mail usage. In contrast, only one third of the senior internet users used social media in the preceding three months.

Our important finding is that regarding senior citizens, socio-demographic variables explain variance in internet adoption and social uses less than for the younger population. The relatively slight effect of background variables in later adulthood may be explained by the psychological and social factors deriving from the socio-emotional selectivity theory (Carstensen & Isaacowitz, 1999) and the social homophily approach (DiMaggio & Garip, 2011; Rogers, 2003). According to the socio-emotional selectivity theory, because of the feeling that time is “running out”, seniors try to avoid the emotional risks that would result from the stress-inducing adoption of digital skills, exposure to unpleasant information and to interaction with anonymous people. In addition, the homophily of social networks for seniors, which consisted previously of other seniors, reduces the odds of internet adoption and increases the digital inequality between the two age groups. We can also hypothesize that the homophily of seniors’ social networks may be the reason for our findings about the interactions between the wave of data collection and socio-demographic variables. The insignificant interactions indicate that the effect of socio-demographic factors is stable over time and the gap between Jews and Arabs as well as differences on the basis of gender, religiosity and income may remain in the future. This is in contrast to the younger age group, where the effects of socio-demographic variables on internet access changed over time, perhaps, among other reasons, because of the heterogeneity of their social network.

Our findings indicated that belonging to certain groups within the older age group intersected with additional risk factors:

One such factor was ethnic and national minorities. In contrast to veteran Jews, immigrants and Arabs experienced an additional disadvantage which can be a source of e-exclusion as minority groups. Elderly immigrants have difficulties in socio-cultural and economic adjustment in Israeli society, whereas Arabs are an historically disadvantaged ethnic minority. In the beginning of the 2000s these two minority groups were less likely to use the internet, compared to veteran Jews. Moreover, less than 2% of senior Arabs used internet in the preceding three months, i.e., this group is just starting ICT adoption and is in the stage of the first-level digital divide. In other words, among Arab seniors only “innovators”, in Rogers’ (2003) terms, adopted the new technology. Thus the second-level digital divide, which is now the focus of research literature (Jin & Cheng, 2008; Van Dijk, 2005), is not yet relevant for them. The late introduction and ineffective use of the internet in the Arab sector may be attributable to cultural factors that link Israeli Arabs with the traditional Muslim world (Lissitsa, 2014).

As for the immigrants, the pace of internet adoption among them was faster, compared to veteran Jews and over time the between-group differences were eliminated. Multivariate analysis among internet users showed that senior immigrants were similar to veteran Israelis in human capital uses. Immigrants were more likely to use social-capital enhancing forms of internet, compared to veteran Israelis, however this advantage was eliminated after controlling for socio-demographic variables. One of the reasons for the original advantage of the immigrants in social capital-enhancing forms of internet use is the fact that the social networks of veterans are concentrated in Israel and are physically accessible to them, while the social networks of immigrants are divided between the country of origin and the target country, and in the case of FSU immigrants among other diasporas of Russian Jews (Lissitsa, 2006; Remennick, 2013).

---

3 Immigrants from the FSU are the largest immigrant group (15% of the entire population of Israel). According to CBS, immigrants from Europe comprise 80% of Israeli immigrants since 1989 (the only distinction is based on the last continent of residence). The vast majority of them are from the FSU.
The role of Hebrew proficiency in closing the ethnic gap among senior citizens should be noted. Both minority groups are characterized by low proficiency in Hebrew (older immigrants have difficulty in learning a new language; Arabs have low motivation and are affected by historical factors) and these facts create important barriers to ICT adoption in both groups. Better command of Hebrew decreases the differences between both senior immigrants and Arabs, and veteran Jews in internet adoption. However, among internet users the negative effect of Hebrew proficiency on social capital uses may be explained by the usefulness of immigrants’ native language in social media. Moreover, this finding may indicate the moderate level of immigrants’ social integration in Israeli society. The relative “size” and “usefulness” of the immigrants’ native language (Russian, English, French etc.) in Israeli internet sites, and the number and variety of non-Israeli sites in these languages may offer an additional explanation for our findings.

Another important factor is gender: women are less likely to access and use the internet in human capital-enhancing ways, compared to men and this disadvantage remained stable after controlling for socio-demographic factors. Among the seniors the gender gap in internet access and human capital-enhancing digital uses is likely to remain over time due to the similar pace of adoption by both genders. This stands in contrast to the 20–64 age group in which the disadvantage of females in internet access was found to become an advantage over time because of their faster rate of adoption of technology.

Yet another risk factor is SES: respondents with higher education and family income are more likely to adopt the internet, compared to those with lower SES. The effect of income among senior citizens was stable over the time. Our findings show that although age and education are main predictors of internet adoption and use for those in the labor market (see also DiMaggio & Bonikowski, 2008; DiMaggio et al., 2004), in later adulthood education and income positively correlated with internet adoption, while their effects on human capital-enhancing uses were insignificant.

The relatively strong risk factor is religiosity. In religious and very religious (in the Jewish sector ultra-orthodox) communities, internet adoption and use are significantly lower, compared to traditional and secular populations. It is possible to discern an attitude of suspicion toward all aspects of communication technologies in religious and ultra-religious circles. In both Jewish and Arab groups, the internet is perceived as a disruptive influence to tradition and a hindrance to religious indoctrination and to the prevailing patriarchal orientation (Bunt, 2009; Dahlberg, 2007; Loch, Straub, & Kamel, 2003; Stout & Buddenbaum, 1996) because it gives great accessibility to more modern views of liberalism, secularism and feminism, among other issues. In both groups the religious authorities are concerned that the life style of the community will be negatively affected if traditional social and communication arrangements are upset (Bunt, 2009; Lev-On & Neriya-Ben Shahar, 2012; Zimmerman-Umble, 1992).

An additional disadvantaged group is composed of people with physical and health problems that interfere with day-to-day functioning. Although the internet is particularly important for people with mobility- and activity limitations because it serves as a platform for interpersonal communication, maintaining family bonds (especially across vast distances), and expanding social networks, this group realized its potential less than others.

Study limitations derive from the limitations of the CBS social survey database. In this survey capital-enhancing digital uses were examined without details (purpose of surfing, kind of sites visited, types of social media used by respondents, languages of surfing, etc.). Moreover, the human capital-enhancing digital users were measured only by one item. Further research should assess the trends of change in capital-enhancing digital uses among the senior population taking these points into consideration.

7. Practical implications

The findings of this study have important implications for researchers, educators, practitioners and policy makers who attempt to promote internet use among Israeli older adults. Moreover, our findings regarding the effects of target language, education, ethnicity, income and health problems on internet adoption and use are relevant not only to the Israeli case but may also be generalized to other countries.

The main disadvantaged group in internet access was the senior Arab population. The results of the current investigation suggest that overcoming digital divides is a complex challenge that goes beyond improving internet access. Closing digital gaps requires changes in basic social, economic and cultural aspects of the Arab sector on the individual level, i.e., personal motivation, as well as on the
community level, including collective socio-cultural preferences. Although Arabic is Israel’s second official language, most of the sites belonging to major bodies in the public sector had little or no information in Arabic and among those that did, the gap between the Hebrew and Arabic content in terms of scope, currency and quality of language was usually great (Abraham Fund, 2013). Therefore, it is recommended that efforts continue to increase the scope and quality of Arabic content materials published on Israeli public sites.

The next disadvantaged group in terms of internet access was immigrants. However, the effects were diminished after controlling for Hebrew language proficiency. The integration of Hebrew learning and digital skill acquisition at the appropriate level for senior citizens would be useful for immigrants. In addition, senior immigrants should be offered the opportunity to surf Israeli portals in the mother tongue, in order to bring them closer to Israeli culture and facilitate their integration.

The next disadvantaged groups are religious and ultra-religious people. We believe that the acceptance of internet use by Jewish and Arab religious and community authorities can facilitate its penetration among the more traditional and older segments of these sectors. The key to this transformation may lie in emphasizing to their leaders how internet use can enhance religious and traditional indoctrination. Such developments have already been observed among a few of the more progressive circles of ultra-orthodox Jews (Lev-On & Neriya-Ben Shahar, 2012).

In terms of accessibility, this study found a positive correlation between family income and internet adoption. It is likely that the costs of purchasing a computer or internet access entail economic constraints. One way to alleviate this problem may be to provide publicly accessible information technologies, for example, in community clubs, senior citizen clubs, and independent- and assisted- living projects for the elderly.

If senior citizens are able to effectively use the diverse opportunities offered by the internet they can, in the long run, maintain their quality of life and enjoy the feeling that they are not only “e-included” but also continue to be important and influential members of society.

Acknowledgements

The authors would like to thank Marc Verboord and the three anonymous reviewers for their valuable comments and insightful remarks on earlier drafts of this paper. The authors also thank to the Central Bureau of Statistics for Social survey 2003–2012 datasets.

Appendix A. Socio-demographic characteristics of the sample

<table>
<thead>
<tr>
<th>Age 20–64</th>
<th>Age 65+</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td>Veteran Jews</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Arabs</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>Immigrants</td>
<td>17%</td>
</tr>
<tr>
<td>Gender</td>
<td>Females</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td>Males</td>
<td>49%</td>
</tr>
<tr>
<td>Locality</td>
<td>Periphery</td>
<td>42%</td>
</tr>
<tr>
<td></td>
<td>Center</td>
<td>58%</td>
</tr>
<tr>
<td>Religiosity</td>
<td>Secular</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Traditional, not so religious</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Religious</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td>Very religious</td>
<td>8%</td>
</tr>
<tr>
<td>Education (Highest diploma received)</td>
<td>Secondary school completion, but not a matriculation</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Matriculation certificate</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Post-secondary, non-academic certificate</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>BA, academic certificate, or similar certificate</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>MA, MD, or similar certificate</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>PhD, or similar certificate</td>
<td>1%</td>
</tr>
</tbody>
</table>
## Appendix A

### (Continued)

<table>
<thead>
<tr>
<th>Employment</th>
<th>Age 20–64</th>
<th>Age 65+</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not work</td>
<td>28%</td>
<td>85%</td>
<td>38%</td>
</tr>
<tr>
<td>Works</td>
<td>72%</td>
<td>15%</td>
<td>62%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Age 20–64</th>
<th>Age 65+</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>66%</td>
<td>60%</td>
<td>65%</td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Widowed</td>
<td>2%</td>
<td>31%</td>
<td>6%</td>
</tr>
<tr>
<td>Single</td>
<td>25%</td>
<td>2%</td>
<td>21%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical or health problems interfering with day-to-day functioning</th>
<th>Age 20–64</th>
<th>Age 65+</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>No health problem</td>
<td>73%</td>
<td>27%</td>
<td>65%</td>
</tr>
<tr>
<td>Health problem not bothering at all</td>
<td>4%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td>Health problem not so bothersome</td>
<td>6%</td>
<td>12%</td>
<td>7%</td>
</tr>
<tr>
<td>Health problem bothersome</td>
<td>11%</td>
<td>29%</td>
<td>14%</td>
</tr>
<tr>
<td>Health problem very bothersome</td>
<td>6%</td>
<td>24%</td>
<td>9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family income (NIS)</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10,711.5</td>
<td>7216.4</td>
<td>6547.3</td>
<td>5302.9</td>
<td>10,001.5</td>
<td>7102.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hebrew proficiency (Scale 1–5)</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.4</td>
<td>1.0</td>
<td>3.4</td>
<td>1.4</td>
<td>4.3</td>
<td>1.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40.5</td>
<td>12.6</td>
<td>73.8</td>
<td>6.0</td>
<td>46.0</td>
<td>17.0</td>
</tr>
</tbody>
</table>

## Appendix B. Internet uses among internet users over time

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>65+ %</td>
<td>92%</td>
<td>92%</td>
<td>93%</td>
<td>93%</td>
<td>92%</td>
<td>90%</td>
<td>90%</td>
<td>93%</td>
<td>94%</td>
<td>94%</td>
</tr>
<tr>
<td>20–65 %</td>
<td>92%</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
<td>92%</td>
<td>94%</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>E-mail</td>
<td>65%</td>
<td>83%</td>
<td>83%</td>
<td>80%</td>
<td>78%</td>
<td>82%</td>
<td>85%</td>
<td>84%</td>
<td>84%</td>
<td>82%</td>
</tr>
<tr>
<td>20–65 %</td>
<td>78%</td>
<td>79%</td>
<td>81%</td>
<td>82%</td>
<td>84%</td>
<td>84%</td>
<td>88%</td>
<td>87%</td>
<td>88%</td>
<td>87%</td>
</tr>
<tr>
<td>Social media</td>
<td>65%</td>
<td>11%</td>
<td>16%</td>
<td>15%</td>
<td>13%</td>
<td>24%</td>
<td>33%</td>
<td>41%</td>
<td>42%</td>
<td>42%</td>
</tr>
<tr>
<td>20–65 %</td>
<td>22%</td>
<td>23%</td>
<td>26%</td>
<td>28%</td>
<td>42%</td>
<td>45%</td>
<td>53%</td>
<td>57%</td>
<td>61%</td>
<td>67%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social capital forms of internet use, scale 0–2</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–65 Mean</td>
<td>0.94 (0.53)</td>
<td>0.99 (0.57)</td>
<td>0.94 (0.59)</td>
<td>0.91 (0.55)</td>
<td>1.06 (0.62)</td>
<td>1.18 (0.63)</td>
<td>1.26 (0.67)</td>
<td>1.26 (0.64)</td>
</tr>
<tr>
<td>t</td>
<td>1.13</td>
<td>0.51</td>
<td>2.52</td>
<td>4.44</td>
<td>4.50</td>
<td>3.43</td>
<td>3.76</td>
<td>4.88</td>
</tr>
</tbody>
</table>

* $ p < .05$.
** $ p < .01$.  

## References


Darnton, A., 2006. Communicating with the over 75s. Department for Culture, Media and Sport, London.


**Sabina Lissitsa** is a senior lecturer in the Communication School at Ariel University. She earned her Ph.D. from Tel-Aviv University in 2006, specializing in integration of FSU immigrants in Israeli society. Her research interests are: digital divide, immigrants’ integration and intercultural relations.

**Svetlana Chachashvili-Bolotin** is a lecturer and a researcher at the Ruppin Academic Center in Netanya, Israel. She holds a PhD in Sociology and Anthropology from Tel Aviv University. Her main areas of research include digital divide, migration, social stratification, sociology of education and research methods.