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Time devoted by the elderly to the Internet: Influence of personal and family variables in Mexico and Chile •

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Abstract

In the context of a growing interest by older individuals in Internet activities, we provide evidence from two OECD countries in Latin America, Mexico and Chile. Using Time Use Surveys, we find, in both countries, that men and women with a university education devote more time to internet activities than those with only a primary education. Furthermore, in Mexico, we observe that women with university education devote less time per week to internet activities than do men with the same level of education. Regarding the presence of children in the household, we observe that, women in Chile devote more time per week to Internet activities than do men, in households with children. Considering that Internet use reduces the isolation or exclusion of individuals in specific socio-economic groups, and, consequently increases the quality of life, the results shown in this paper can be useful in terms of public policy.

Keywords: Elderly, Internet, Time use, Latin America countries, OECD countries

JEL Classification: D12 J14, J22

Introduction

In Mexico and Chile as in the rest of the world the number of people using the Internet has grown considerably in recent years (INEGI, 2020; OECD, 2020; World Bank 2016, 2020). According to the World Bank (2020), Internet use in Mexico has gone from 20.8% of the population in 2007 to 63.9% in 2017, and in the case of Chile, Internet use has gone from 35.9% of individuals in 2007 to 83.3% in 2017. This increase has occurred in all population groups, including the group of older adults. According to OECD data (2020), the percentage of individuals aged from 55 to 74 who use the Internet on a daily basis has risen from 6.78% in Mexico in 2014 to 22.66% in 2017, and in Chile from 31.35% in 2014 to 50.12% in 2017. Digital technologies have reduced the costs of information, have influenced the participation of women in the labor force, have facilitated individual communication, and have also influenced the leisure time of individuals (Wodjao, 2020; World Bank, 2016).

The positive effects of the internet, have been analyzed in many areas, such as economic and development growth, technological productivity, foreign direct investment, problems of political economy, inflation, and the shadow economy (Madon, 2000; Elgin, 2013; Sassi and Goaid, 2013; Salahuddin and Gow, 2016). Pantea and Martens (2016), in a study of France, Germany, Italy, Spain, and the United Kingdom confirmed that access to the Internet leads to important gains in well-being. In this sense, several studies have analyzed how internet use influences job satisfaction (Venkatesh and Speier, 1999; Salanova et al, 2004; Golden and Veiga, 2005; Martin and Omrani, 2015; Bala and Venkatesh , 2015), how the internet influences life satisfaction (Bruni and Stanca, 2008; Castronova and Wagner, 2011; Kavetsos and Koutroumpis, 2011; Graham and Nikolova, 2013; Katz and Koutroumpis, 2013; Pénard et al., 2013; Ganju et al., 2015; Sabatini and Sarracino, 2017), and how the internet influences psychological well-being (Kraut et al., 1998; Chen and Persson, 2002; Gross et al., 2002; Cotten, 2008; Jackson et al., 2008; Steinfeld et al., 2008).

Furthermore, an increasing number of investigations have focused on analyzing the influence of the Internet on older adults. This interest is partly due to the fact that, while it is still true that there is a gap between the young and the old in terms of Internet use, it is also true that the gap is decreasing year by year (OECD, 2020; World Bank, 2020). There is a body of literature showing that the Internet influences life satisfaction and well-being for older adults (White et al., 1999; Wright, 2000; Chen and Persson, 2002; White et al., 2002; Shapira et al., 2007; Quintana et al., 2018; Lifshitz et al., 2018). In this sense, Chen and Person (2002)

show that older Internet users are more positive than non-users in terms of psychological well-being and personal characteristics. Shapira et al. (2007) show that computer and Internet use appears to contribute to older adults' well-being and sense of empowerment, by affecting their interpersonal interactions, promoting their cognitive functioning, and contributing to their feelings of control and independence. Quintana et al. (2018) find that digital literacy (the use of Internet/E-mail) has a significant association with life-satisfaction, after controlling for income, health, gender, and other personal covariates. Lifshitz et al. (2018) investigate the relationship between various uses of the Internet (communication, information, task performance, leisure), depression, and life satisfaction in later life, using data from Internet users aged 50 and over. These authors find that Internet use for leisure positively predicts subjective well-being and negatively predicts depression.

Additionally, prior research suggests that Internet activities, such as e-mail and social networking, using computers for entertainment, and accessing the internet for information, helps older adults to feel less isolated and lonely (Malcolm et al., 2002; Nahm and Resnick, 2001; Clark, 2002; Fogel et al., 2003; Jung and Sundar, 2016). Older adults are using computers to communicate with family and friends via e-mail and social networking sites, enjoying computer software for entertainment, and searching the Internet for information on personal issues and health (Gatto and Tak, 2008; Vronam et al, 2015; Jung and Sundar, 2016). Furthermore, the use of social networking sites (such as Facebook) is important in terms of maintaining pre-existing social relationships, building new (albeit virtual) relationships, and following the growth paths of children and grandchildren (Jung and Sundar, 2016).

Despite this positive evidence regarding internet use and older adults, to the best of our knowledge, very few prior papers have addressed the impact of socio-demographic variables on the uses of the Internet by the elderly. Hogeboom et al. (2010) provide evidence on the determinants of Internet use by the elderly in the United States, with a sample of 2,284 people, from the 2004 Health and Retirement Study wave. Their results show that current employment, a white-collar occupation, more years of education, a younger age, and a higher household income were all associated with more Internet use. Vroman et al. (2015) for the New England region, with a sample of 198 older adults, show that the majority of participants used ICT (information communication technology) to maintain family and social connections and to access information on health and routine activities. And those adults aged 65–70 with higher education and/or living with a spouse/partner were more likely to use ICT. Molina et al. (2016), using data from the 4,036 individuals aged 65 and older from the Spanish Time

Use Survey for 2009-2010, find that being male has a positive influence on the time devoted to searching for information with the computer, whereas age has a negative effect on this activity. Furthermore, the authors find that time devoted to internet activities (searching information with the computer and computer communication) increases at the highest level of education, and a larger number of family members has a negative influence on the time spent on Internet activities.

Based on this framework, the main objective of this paper is to provide evidence for Latin American countries, analyzing how socio-demographic characteristics influence the time spent by older adults on internet activities, primarily focusing on gender, education levels, and the presence of children in the household (5- 17 years). We analyze the time that 4,836 individuals in Mexico and 3,222 individuals in Chile, aged 65 and older, devote to Internet activities (browsing or consulting information on the internet, checking email, checking social networks, and chatting). To that end, we use data from the Time Use Surveys for Mexico (2014) and Chile (2015) and we estimate linear models (OLS) for each country separately.¹

Our main econometric results show that men and women with university education devote more time to internet activities compared to men and women with only primary education. In Mexico, with respect to gender differences and education levels, we observed that women with university education devoted less time per week to internet activities, compared to men with university education. Regarding the presence of children in the household, we observe that women in Chile devoted more time per week to Internet activities than did men in households where there were children. In households with no children, women devoted less time per week to Internet activities, compared to men.

Our results are consistent with prior studies showing that education levels influence the various uses of the Internet by the elderly (Hogeboom et al., 2010; Vroman et al., 2015; Molina et al., 2016). We also show that in Mexico there are gender differences when we compare levels of education. Regarding the presence of children in the household, our results show that their presence (or not), in Chile, influences the time that men and women dedicate to Internet activities. As justifications for the last results, older individuals are more likely to use a computer if a friend or adult child also uses a computer (Tak and Hong, 2005). Often, when older children get a new computer, they give the older computer to the older members

¹By comparison terms, Mexico and Chile have been OECD member countries since 1994 and 2010, respectively. OECD countries and their key partners represent around 80% of global trade and investments.

of the household. (Fox, 2004; Saunder, 2004). In our research, we observe that the presence of children in the household benefits women in Chile in the time dedicated to Internet activities.

The rest of the paper is organized as follows: Section 2 describes the data and variables, Section 3 describes the empirical strategy and presents our results, and Section 4 concludes.

Data and variables

We use the information from time use surveys for Mexico (2014) and Chile (2015), restricting our sample to individuals aged 65 and older, with no other restrictions concerning the presence of other family members or civil status. Considering the age restriction, our study sample is 4,836 individuals in Mexico and 3,222 individuals in Chile. We focus on analysing the time dedicated by those surveyed to Internet activities. Internet activities includes the time devoted by individuals to browsing or consulting information on the internet, checking email, checking social networks, and chatting. Internet activity is measured in hours per week for both Mexico and Chile.²

These surveys are representative at the national level, and the targeted populations are household members aged 12 and above. The two surveys use a list of precoded activities. The methodologies for the time use surveys used in this paper have been defined by the relevant institutes of statistics in each country: INEGI (National Institute of statistics and geography) in Mexico, and INE (National Institute of statistics) in Chile. Time use surveys provide us with information on individual time use, and represent the typical instrument used to analyze individual time-allocation decisions (Aguiar and Hurst, 2007; Bianchi, 2000; Folbre et al. 2005; Gershuny, 2000; Gimenez-Nadal and Sevilla, 2012; Gimenez-Nadal and Molina 2015; Campaña et al, 2015).

For the variables that could influence whether those being surveyed dedicate more or less time to Internet activities, we focus on: gender, the education level, and the presence of children in the household (aged 5- 17 years). The gender variable is important in that leisure time preferences vary for men and women (Giménez Nadal and Sevilla 2012), and that men dedicate more time to certain internet activities than do women (Molina et al., 2016, 2017).

²The Time Use Survey from Chile contains information for one day of the week and another day of the weekend. For purposes of comparison with Mexico, whose information is given in hours per week. we multiply by 5 the day of the week and by two the day of the weekend.

We focus on education, in three levels: Primary education (less than a secondary school diploma), Secondary education (a secondary school diploma), and University education (more than a secondary school diploma). Education influences the distribution of time that individuals allocate to different activities (Kalenkoski et al., 2005; Guryan et al. 2008; Gimenez-Nadal and Molina, 2013; Campaña et al., 2017). A higher level of education (or more years of schooling) influences the elderly to devote more time to Internet activities (Molina et al., 2016), and the presence of children in the household primarily influences the time that women allocate to their time-use activities (Gimenez Nadal and Molina, 2013; Gimenez Nadal and Sevilla, 2014; Molina et al., 2016, 2017; Campaña et al., 2015, 2017).

Following other time use studies, we consider as control variables: age, age squared, household income, partner, presence of other members in the household, ethnic origin, population density (more than 100,000 people) and regions of the countries (Kalenkoski et al., 2005; Aguiar and Hurst 2007; Molina et al., 2016, 2017; Campaña et al., 2015, 2017, 2020). We consider age and age squared divided by 100 (Kalenkoski et al., 2005; Aguiar and Hurst 2007) in order to take into account the allocation of time to an activity over the whole life cycle. We consider household income and retirement income. In the case of Chile, the available information on household income and retirement income are two separate variables, while in the case of Mexico, all available income information is grouped into household income. In Mexico, the household income includes retirement income, income from transfers (income from other households, and subsidies from the government or from private institutions), other income (income from rents of houses, apartments, vehicles, machinery and equipment), and includes income from bank interest and from stocks or dividends. In the case of Chile, the retirement income includes income from retirement itself, and the household income includes income from transfers (income from other households, and subsidies from the government or from private institutions) and other income (income from rents of houses, apartments, vehicles, machinery and equipment). For both countries, incomes are expressed in US Dollars.³ The income variable influences individuals to devote more or less time to different activities (Kalenkoski et al. 2005).

We consider whether the individuals surveyed are living together in couple, and the presence of other members in the household. Prior research shows that the presence of a partner and other members of the household influences time and access to computers and

³ The exchange rate used according to the years of their time use surveys for Mexico is 1 US dollar, equivalent to 13.579 Mexican pesos and for Chile it is 1 US dollar, equivalent to 697.33 Chilean pesos.

internet activities (Vroman et al., 2015; Molina et al 2016) To measure ethnic differences, we consider whether the respondents are indigenous, or not (Campaña et al 2017, 2020). For Mexico, we consider the size of the municipality (more than 100.000 people), but this information is not available for Chile. For the region of residence of respondents in Mexico, we consider four regions (Center, West-Center, North, South-South-East), and in Chile, six regions (Norte Grande, Norte Chico, Central Nucleus, Concepción and La Frontera, Region of the Lakes, Region of the Channels for Chile).⁴

Table 1 shows the descriptive statistics for the socio-demographic variables in Mexico and Chile. Columns 1 and 3 for men, and Columns 2 and 4 for women, respectively. In Mexico, the average age is 73.50 years for men and 73.88 years for women, and in Chile the average age is 73.05 years for men and 73.89 years for women. Regarding income (household and retirement), in Mexico the monthly income for men is 210 US dollars and for women 182 US dollars. In Chile, the monthly income for men is 384 US dollars and for women 250 US dollars. The majority of our study sample have had a primary education (90.5% in Mexico and 65% in Chile). With regard to household characteristics (men and women), we observe, in Mexico there is a presence of 7.5% of children in the households and in Chile there is a presence of 4% of children in the households.

(Table 1 here)

In Mexico, 56% of the households of the men and 64% of the households of the women, have other members present, and in Chile, those proportions are 56% of the households of the men and 64% of the households of the women. In Mexico, 73% of men and 43% of women live with a partner, and in Chile 74% of men and 40% of women live with a partner. Ethnic characteristics are similar for men and women in the three countries (6% indigenous in Mexico and 5% indigenous in Chile). In Mexico, 38% of the men and 45% of the women live in a locality with a population of more than 100,000.

Table 2 shows descriptive statistics for the time devoted to internet activities by our study sample, focusing on gender, education level and the presence of children in the household (5-17 years). In both Mexico and Chile, men devote more time to internet activities than do women, with the differences being greater in Chile. In Mexico, men dedicate 0.20 hours per week to internet activities while women dedicate 0.12. And in Chile, men dedicate 1.73 hours per week to internet activities while women dedicate 0.88. Men and women with university

⁴ The four regions of Mexico comprise 32 federal entities, and the six regions of Chile comprise 15 provinces.

education devote more time to internet activities than do men and women with primary education, in both countries. In Mexico, men with university education dedicate 2.04 hours per week to internet activities while men with primary education dedicate 0.04 hours, and women with university education dedicate 1.18 hours per week to internet activities, while women with primary education dedicate 0.07 hours. In Chile, men with university education dedicate 5.29 hours per week to internet activities while men with primary education dedicate 0.62, and women with university education dedicate 3.63 hours per week to internet activities while women with primary education dedicate 0.27 hours.

(Table 2 here)

In both Mexico and Chile, men and women who have children in their households devote less time to internet activities compared to those who do not, with these differences being greater in the case of men. In Mexico, men with children in the household dedicate 0.09 hours per week to internet activities while men with no children in the household dedicate 0.21 hours; women with children in the household dedicate 0.01 hours per week to internet activities while women with no children in the household dedicate 0.13 hours. In Chile, men with children in the household dedicate 0.71 hours per week to internet activities while men with no children in the household dedicate 1.77 hours; women with children in the household dedicate 0.77 hours per week to internet activities while women with no children in the household dedicate 0.89 hours.

The results shown in Table 2 are only a descriptive analysis, and we do not control for other factors that may be affecting the results. In the following sections and with a suitable econometric model for this kind of data, we analyze these relationships, controlling for other factors.

Empirical strategy and results

For the time devoted by the elderly in Mexico and Chile to internet activities, we estimate Ordinary Least Squares (OLS) regressions. Gershuny (2012) argues that OLS models can deliver accurate estimates of average activity times for samples and subgroups. Frazis and Stewart (2012) also prefer these models for the analysis of time-allocation decisions, while Foster and Kalenkoski (2013) discussing the analysis of childcare time, compare OLS and Tobit models, finding that the qualitative conclusions of the two models are similar.

Thus, we estimate the following equation by OLS regressions:

$$T_{ik} = \alpha_t + \beta_1 woman_{ik} + \beta_2 x_{ik} + \beta_3 Interactions_{ik} + \beta_4 Z_{ik} + \varepsilon_{ik} \quad (1)$$

where T_{ik} is the time devoted to Internet activities by individual ‘i’ in country ‘k’, $Woman_{ik}$ takes value ‘1’ if respondent ‘i’ in country ‘k’ is a woman and value ‘0’ otherwise. X_{ik} is a vector of variables that includes dummies for secondary and university education and the presence of children between 5 and 17 in the household of respondent ‘i’ in country ‘k’. $Interactions_{ik}$ includes a vector of interactions between the variables included in vector X_{ik} , and Z_i includes additional demographic variables explained above (age, age squared, household income, partner, presence of others in the household, ethnic origin, locality (more than 100,000 people), and regions of the country). The woman dummy is included to measure gender differences in the time devoted to Internet activities. Thus, $\beta_1 < 0$ would indicate that, compared to men, women in Mexico and Chile devote less time to Internet activities.

Column 1 (Mexico) and Column 4 (Chile) in Table 3 show the results of estimating Equation 1 without interactions. In this regression, the reference category is men. In both countries, we can see that β_1 is negative, but it is not statistically significant, so in our general econometric analysis we found no gender differences in the time devoted to Internet activities. Table A1 in the appendix shows, in detail, interesting and statistically significant results at standard levels of this first estimate for Mexico (Column 1) and Chile (Column 4). In terms of age, we found, as expected, a negative influence in Mexico on the time dedicated to Internet activities (Madden and Savage, 2000; Chen and Persson, 2002; Wright and Hill, 2009; Hoogeboom et al 2010; Vroman et al., 2015). In Chile, having a partner positively influences the time devoted to internet activities, and in Mexico the presence of others in the household negatively influences the time devoted to the Internet (Molina et al 2016). In Mexico, with respect to the locality (more than 100,000 people), we see significant and positive values. Thus, living in larger cities produces a positive effect on the time dedicated to Internet activities, with the evidence being in line with the related literature (Kelly and Lewis, 2001; Molina et al 2016).

(Table 3 here)

In column 2 (Mexico) and column 5 (Chile) in Table 3, we analyze the influence of education (also considering gender differences) on the time devoted to Internet activities for

the elderly. We include the following interactions: $woman * secondary$ education and $woman * university$ education. In Mexico (column 2 in Table 3), we observe that $\beta_1 > 0$ and is statistically significant at standard levels, indicating that, women with primary education devote 0.05 more hours per week to internet activities compared to men with primary education. Regarding university education, we observe that women with university education devote 0.89 fewer hours per week to internet activities compared to men. As justification of this result, Campaña et al (2015) shows that gender differences in total work (paid work and unpaid work), in Latin American countries, increase when educational levels are higher, so that women with higher levels of education have less time for other activities (e.g. leisure) compared to men. In Chile (column 2 in Table 3), we do not observe statistically significant differences in terms of gender and levels of education.

Additionally, for men, we observe in Mexico (column 2) and Chile (column 5) that secondary and university education is associated with more time devoted to Internet activities compared to men with primary education, as their coefficients are positive and statistically significant at standard levels: in Mexico, 0.29 and 1.90 hours per week respectively and in Chile, 1.02 and 4.37 hours per week respectively. With respect to women (Table A2 in the Appendix, substituting $\beta_1 woman_{ik}$ for $\beta_1 man_{ik}$ and the respective education interactions), we observe that women in Mexico with university education devote 1.01 more hours per week to Internet activities compared to women with primary education, and women with secondary and university education in Chile devote more time to internet activities compared to women with primary education, with these results being 1.1 and 3.03 hours per week respectively.

We now analyze the time devoted by the elderly, considering the presence of children aged between 5 and 17 in the household. We estimate Equation (1), including the following interaction: $Woman * Children$ in the household. Results are shown in Column 3 (Mexico) and Column 6 (Chile) in Table 3. where the reference category is men with no children between 5 - 17 years in the household. In Chile (column 6) $\beta_1 < 0$ and is statistically significant at standard levels, indicating that, women devoted 0.36 fewer hours per week to Internet activities compared to men in households where there are no children. In Chile, we observe that the presence of children in the household is associated with less time devoted to Internet activities by men, as its coefficient is negative (1.28 hours per week) and statistically significant. Additionally, for Chile, women devoted 1.1 hours more per week to Internet activities compared to men in households with children. In Mexico, we did not find

statistically significant differences when we considered the presence of children in the household.

Conclusions

In both Mexico and Chile, policy makers have made efforts to provide more and more of the population with access to the benefits of the Internet, but these efforts continue to be limited in certain ways. According to the OECD (2019), Mexico has the lowest percentage of households connected to broadband Internet, at 51%, and the lowest percentage of Internet users. In addition, key online activities, such as online education, and searching for health information online, are not widely used, compared to other OECD countries. In Chile, Internet access has increased substantially in the last decade, and the country is above the OECD average, with 87.5% having access. However, the variety of Internet use is limited and the level of inequality of Internet uses is above the OECD average. Additionally, Chile lags behind in the area of digital skills and education.

Based in part on these general limitations and considering that older individuals are increasingly accessing online resources (OECD, 2020), policy-makers must take into account the need to act to protect the elderly segment. In this context, we provide evidence of the socio-demographic determinants of the time the elderly dedicate to Internet activities, and we estimate OLS models with data from Mexico (2014) and Chile (2015). Our main econometric results show that higher levels of education have a positive influence on the time devoted to internet activities. In Mexico, women with university education devote less time per week to Internet activities compared to men with university education. In Chile, women spend more time per week on Internet activities than do men, in households where children are present, while in households without children, women spend less time per week on Internet activities than do men.

In terms of public policy, certain recommendations can be derived from our empirical results. In both Mexico and Chile, the fact that elderly individuals with primary education devote less time to internet activities compared to their peers with a university education, could indicate to policy makers that these individuals have limitations in terms of Internet access, and would benefit from computer training and better access. In Chile, the presence of children in the household influences men and women differentially. Computer training, development of Internet-accessible educational materials, and online social support are among

the interventions that can benefit older adults, who can learn to use computers more effectively (Dauz et al., 2004), and their level of confidence and ease of use of the technology increases with practice. (Adams et al., 2005).

One limitation of our analysis is that our data is a cross-section of individuals and does not allow us to identify differences in the time devoted to work, net of (permanent) individual heterogeneity in preferences and characteristics. At present, there are no panels of time-use surveys currently available, and we leave this issue for future research.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Adams, N., Stubbs, D., and Woods, V. (2005). Psychological barriers to Internet usage among older adults in the UK. *Medical Informatics and the Internet in Medicine*, 30, 3–17.
- Aguiar, M., and Hurst, E. (2007). Measuring trends in leisure: The allocation of time over five decades. *The Quarterly Journal of Economics*, 122(3), 969–1006.
- Bala, H., and Venkatesh, V. (2016). Adaptation to information technology: A holistic nomological network from implementation to job outcomes. *Management Science*, 62(1), 156-179.
- Bianchi, S. M. (2000). Maternal employment and time with children: Dramatic change or surprising continuity? *Demography*, 37 (4), 401–414.
- Bruni, L., Stanca, L., 2008. Watching alone: relational goods, television and happiness. *J. Econ. Behav. Organiz.* 65 (3), 506–528.
- Campaña, J., Giménez, J. I., and Molina, J. A. (2015). Gender differences in the distribution of total work-time of Latin-American families: the importance of social norms. IZA Discussion Paper No. 8933
- Campaña, J. C., Gimenez-Nadal, J. I., and Molina, J. A. (2017). Increasing the Human Capital of Children in Latin American Countries: The Role of Parents' Time in Child care. *The Journal of Development Studies*, 53 (6), 805-825.

- Campaña, J. C., Giménez-Nadal, J. I., and Molina, J. A. (2020). Self-employed and Employed Mothers in Latin American Families: Are There Differences in Paid Work, Unpaid Work, and Child Care?. *Journal of Family and Economic Issues*, 1-18.
- Castronova, E., and Wagner, G. G. (2011). Virtual life satisfaction. *Kyklos*, 64(3), 313-328.
- Chen, Y., and Persson, A. (2002). Internet use among young and older adults: Relation to psychological well-being. *Educational Gerontology*, 28(9), 731-744.
- Clark, D. J. (2002). Older adults living through and with their computers. *CIN: Computers, Informatics, Nursing*, 20(3), 117–124.
- Cotten, S. R. (2008). Students' technology use and the impacts on well-being. *New Directions for Student Services*, 2008(124), 55-70.
- Dauz, E., Moore, J., Smith, C. E., Puno, F., and Schaag, H. (2004). Installing computers in older adults' homes and teaching them to access a patient education web site: A systematic approach. *CIN: Computers, Informatics, Nursing*, 22(5), 266–272.
- Elgin, C. (2013). Internet usage and the shadow economy: Evidence from panel data. *Economic Systems*, 37(1), 111-121.
- Fogel, J., Albert, S. M., Schnabel, F. D., Dittkoff, B. A., and Neugut, A. I. (2003). Racial=ethical differences and potential psychological benefits in use of the Internet by women with breast cancer. *Psycho-Oncology*, 12, 107–117
- Folbre, N., Yoon, J., Finnoff, K., and Fuligni, A. S. (2005). By what measure? Family time devoted to children in the United States. *Demography*, 42(2), 373–390.
- Fox, S. (2004). *Older Americans and the Internet*. Washington, DC: Pew Internet and American Life Project.
- Foster, G. and Kalenkoski, C. (2013) and Tobit or OLS? An empirical evaluation under different diary window lengths, *Applied Economics*, 45, 2994–3010.
- Frazis, H. Stewart, J. (2012) and How to think about time - use data: what inferences can we make about long-and shortrun time use from time use diaries?, *Annals of Economics and Statistics*, 105/106, 231–46.

- Ganju, K. K., Pavlou, P. A., and Banker, R. D. (2015). Does information and communication technology lead to the well-being of nations? A country-level empirical investigation. *MIS Quarterly*, 15-072.
- Gatto, S.L., and Tak, S.H. (2008). Computer, Internet, and e-mail use among older adults: Benefits and Barriers, *Educational Gerontology*, 34, 800-811.
- Gershuny, J. (2000) *Changing Times: Work and Leisure in post-industrial Society*. Oxford: Oxford University Press.
- Gimenez-Nadal, J. I., and Molina, J. A. (2013). Parents' education as a determinant of educational childcare time. *Journal of Population Economics*, 26(2), 719–749.
- Gimenez-Nadal, J.I, and J. A. Molina (2015). Health status and the allocation of time: cross-country evidence in Europe. *Economic Modelling*, 46(2): 188-203.
- Gimenez-Nadal, J. I., and Sevilla, A. (2012) Trends in time allocation: a cross-country analysis. *European Economic Review* 56, 1338–59
- Gershuny, Jonathan. (2000) *Changing Times: Work and Leisure in post-industrial Society*. Oxford: Oxford University Press.
- Golden, T. D., and Veiga, J. F. (2005). The impact of extent of telecommuting on job satisfaction: Resolving inconsistent findings. *Journal of management*, 31(2), 301-318.
- Graham, C., and Nikolova, M. (2013). Does access to information technology make people happier? Insights from well-being surveys from around the world. *The Journal of Socio-Economics*, 44, 126-139.
- Gross, E. F., Juvonen, J., and Gable, S. L. (2002). Internet use and well-being in adolescence. *Journal of social issues*, 58(1), 75-90.
- Guryan, J., Hurst, E., and Kearney, M. S. (2008). Parental education and parental time with children. *The Journal of Economic Perspectives*, 22(3), 23–46.
- Hogeboom, D.L., Mc Dermott, R.J., Perrin, K.M., and Osman, H. (2010). Internet use and social networking among middle age and older adults, *Educational Gerontology*, 36, 93-111.
- INE (2015). *Encuesta Nacional sobre Uso del Tiempo: Documento metodológico*. ENUT 2015.

https://historico-amu.ine.cl/enut/files/documentacion/documento_metodologico_ENUT.pdf
(Access, May 2020)

INEGI (2014). Encuesta Nacional sobre Uso del Tiempo: Documento metodológico
http://internet.contenidos.inegi.org.mx/contenidos/productos//prod_serv/contenidos/espanol/bvinegi/productos/nueva_estruc/702825075545.pdf (Access, May 2020)

INEGI (2020) Encuesta nacional sobre disponibilidad y uso de tecnologías de la información en los hogares, 2019. Nota técnica
https://www.inegi.org.mx/contenidos/saladeprensa/boletines/2020/OtrTemEcon/ENDUTI_H_2019.pdf (Access: April, 2020)

Jackson, L. A., Fitzgerald, H. E., Zhao, Y., Kolenic, A., Von Eye, A., and Harold, R. (2008). Information Technology (IT) use and children's psychological well-being. *CyberPsychology and Behavior*, 11(6), 755-757.

Jung, E. H., and Sundar, S. S. (2016). Senior citizens on Facebook: How do they interact and why?. *Computers in Human Behavior*, 61, 27-35.

Kalenkoski, C. M., Ribar, D. C., and Stratton, L. S. (2005). Parental child care in single-parent, cohabiting, and married-couple families: Time-diary evidence from the United Kingdom. *American Economic Review*, 95(2), 194–198.

Katz, R. L., and Koutroumpis, P. (2013). Measuring digitization: A growth and welfare multiplier. *Technovation*, 33(10-11), 314-319.

Kavetsos, G., and Koutroumpis, P. (2011). Technological affluence and subjective well-being. *Journal of economic psychology*, 32(5), 742-753.

Kelly, R.E. and Lewis, P.E.T. (2001). Household demand for Internet connection, *The Journal of Media Economics*, 14(4), 249-265.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., and Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being?. *American psychologist*, 53(9), 1017.

Lifshitz, R., Nimrod, G., and Bachner, Y. G. (2018). Internet use and well-being in later life: A functional approach. *Aging and Mental Health*, 22(1), 85-91.

- Madon, S. (2000). The Internet and socio-economic development: exploring the interaction. *Information technology and people*.
- Madden, G., and Savage, S.J. (2000). Some economic and social aspects of residential Internet use in Australia, *The Journal of Media Economics*, 13 (3), 171-185.
- Malcolm, M., Mann, W. C., Tomita, M. R., Fraas, L. F., Stanton, K. M., and Gitlin, L. (2002). Computer and Internet use in physically frail elders. *Physical and Occupational Therapy in Geriatrics*, 19(3), 15-32.
- Martin, L., and Omrani, N. (2015). An assessment of trends in technology use, innovative work practices and employees' attitudes in Europe. *Applied Economics*, 47(6), 623-638.
- Molina, J. A., Campaña, J. C., and Ortega, R. (2016). Internet and the elderly in Spain: time dedicated to search and communications. MPRA Paper No. 74419
- Molina, J. A., Campaña, J. C., and Ortega, R. (2017). Children's interaction with the Internet: time dedicated to communications and games. *Applied Economics Letters*, 24(6), 359-364.
- Nahm, E.-S. and Resnick, B. (2001). Homebound older adult's experiences with the Internet and e-mail. *Computers in Nursing*, 19(6), 257-263.
- OECD (2019), *How's Life in the Digital Age?: Opportunities and Risks of the Digital Transformation for People's Well-being*, OECD Publishing, Paris. <https://doi.org/10.1787/9789264311800-en>
- OECD (2020) OECD. Stat <https://stats.oecd.org/index.aspx?queryid=72702#> (Access: April, 2020)
- Pantea, S., and Martens, B. (2016). The value of the Internet as entertainment in five European countries. *Journal of Media Economics*, 29(1), 16-30.
- Pénard, T., Poussing, N., and Suire, R. (2013). Does the Internet make people happier?. *The Journal of Socio-Economics*, 46, 105-116.
- Quintana, D., Cervantes, A., Sáez, Y., and Isasi, P. (2018). Internet use and psychological well-being at advanced age: Evidence from the English longitudinal study of aging. *International journal of environmental research and public health*, 15(3), 480.
- Sabatini, F., and Sarracino, F. (2017). Online networks and subjective well-being. *Kyklos*, 70(3), 456-480.

- Salahuddin, M., and Gow, J. (2016). The effects of Internet usage, financial development and trade openness on economic growth in South Africa: A time series analysis. *Telematics and Informatics*, 33(4), 1141-1154.
- Salanova, M., Cifre, E., and Martin, P. (2004). Information technology implementation styles and their relation with workers' subjective well-being. *International Journal of Operations and Production Management*.
- Saunders, E. J. (2004). Maximizing computer use among the elderly in rural senior centers. *Educational Gerontology*, 30, 573–585.
- Sassi, S., and Goaid, M. (2013). Financial development, ICT diffusion and economic growth: Lessons from MENA region. *Telecommunications Policy*, 37(4-5), 252-261.
- Shapira, N., Barak, A., and Gal, I. (2007). Promoting older adults' well-being through Internet training and use, *Ageing and Mental Health*, 11 (5), 477-484.
- Steinfeld, C., Ellison, N. B., and Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology*, 29(6), 434-445.
- Tak, S. H. and Hong, S. H. (2005). Use of the Internet for health information by older adults with arthritis. *Orthopaedic Nursing*, 24(2), 134–138.
- Venkatesh, V., and Speier, C. (1999). Computer technology training in the workplace: A longitudinal investigation of the effect of mood. *Organizational behavior and human decision processes*, 79(1), 1-28.
- Vroman, K. G., Arthanat, S., and Lysack, C. (2015). “Who over 65 is online?” Older adults' dispositions toward information communication technology. *Computers in Human Behavior*, 43, 156-166.
- White, H., McConnell, E., Clipp, E., Bynum, L., Teague, C., Navas, L., et al. (1999). Surfing the net in later life: A review of the literature and pilot study of computer use and quality of life, *Journal of Applied Gerontology*, 18, 358-378.
- White, H., McConnell, E., Clipp, E., Branch, L.G., Sloane, R., Pieper, C., and Box, T.L. (2002). A randomized controlled trial of the psychosocial impact of providing Internet training and access to older adults, *Ageing and Mental Health*, 6(3), 213-221.

- Wodjao, T. B. (2020). A double-hurdle model of computer and internet use in american households. Departement of Economics, Western Michigan University. Fabrizio Carlevaro, Yves Croissant, Stéphane Hoareau, 49.
- World Bank Group. (2016). World development report 2016: digital dividends. World Bank Publications.
- World Bank (2020)
<https://databank.bancomundial.org/reports.aspx?source=2andseries=IT.NET.USER.ZSan dcountry=> (Access: April, 2020)
- Wright, K. (2000). Computer-mediated social support, older adults, and coping, *Journal of Communication*, 50(3), 100-118.
- Wright, D.W., and Hill, T.J. (2009). Prescription for trouble: Medicare Part D and patterns of computer and Internet access among the elderly, *Journal of Aging and Social Policy*, 21, 172-186.

Table 1. Descriptive statistics

Variable	Mexico				Chile			
	Men		Women		Men		Women	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Age	73.50	7.26	73.88	7.48	73.05	6.44	73.89	6.85
Income (us dollars)**								
Household income	210.36	1109.9	181.96	1012.3	43.80	195.0	50.09	262.6
Retirement income	-	-	-	-	340.2	339.9	200.1	194.3
Education								
Primary	0.89	0.31	0.92	0.27	0.60	0.49	0.70	0.46
Secondary	0.03	0.17	0.04	0.20	0.21	0.40	0.18	0.38
University	0.08	0.27	0.04	0.19	0.19	0.39	0.12	0.33
Household characteristics								
Children in the household (5-17 years)	0.07	0.26	0.08	0.27	0.04	0.19	0.04	0.20
Other members in the household >18	0.56	0.50	0.64	0.48	0.50	0.50	0.58	0.49
Partner	0.76	0.43	0.43	0.49	0.74	0.44	0.40	0.49
Ethnic characteristics								
Indigenous	0.06	0.25	0.06	0.23	0.05	0.22	0.05	0.21
Regional dummies								
Locality (more than 100,000 people)	0.38	0.49	0.45	0.50	-	-	-	-
Region 1	0.29	0.46	0.33	0.47	0.05	0.23	0.04	0.21
Region 2	0.23	0.42	0.23	0.42	0.07	0.26	0.06	0.23
Region 3	0.21	0.41	0.19	0.40	0.65	0.48	0.67	0.47
Region 4	0.26	0.44	0.24	0.43	0.16	0.36	0.15	0.36
Region 5	-	-	-	-	0.05	0.22	0.06	0.23
Region 6	-	-	-	-	0.02	0.13	0.02	0.13
Observations	2,229		2,607		1,299		1,923	

Notes: Data sources are time-use surveys from Mexico (2014) and Chile (2015). The sample is restricted to individuals aged 65 and older. Primary education is equivalent to having less than a secondary school diploma. Secondary education is equivalent to having a secondary school diploma. University education is equivalent to having more than a secondary school diploma. Children in the household, represents the presence of children in the household with an age range between 5 and 17 years.

Table 2. Time devoted to internet activities (hours per week)

Variable	Mexico				Chile			
	Men		Women		Men		Women	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Gender	0.20	1.35	0.12	1.32	1.73	5.20	0.88	3.37
Education								
Primary	0.04	0.63	0.07	1.21	0.62	3.10	0.27	1.80
Secondary	0.39	1.39	0.35	1.15	1.78	5.77	1.46	3.67
University	2.04	3.76	1.18	2.85	5.29	7.78	3.63	6.74
Household characteristics								
Children in the household	0.09	1.08	0.01	0.15	0.71	2.45	0.77	3.33
No children in the household	0.21	1.36	0.13	1.37	1.77	5.28	0.89	3.37
Observations	2,229		2,607		1,299		1,923	

Notes: Data sources are time-use surveys from Mexico (2014) and Chile (2015). The sample is restricted to individuals aged 65 and older. Primary education is equivalent to having less than a secondary school diploma. Secondary education is equivalent to having a secondary school diploma. University education is equivalent to having more than a secondary school diploma. Children in the household, represents the presence of children in the household with an age range between 5 and 17 years.

Table 3. OLS regressions on the time devoted to Internet activities

VARIABLES	Mexico			Chile		
	(1) Internet	(2) Internet	(3) Internet	(4) Internet	(5) Internet	(6) Internet
Woman	-0.00363 (0.0325)	0.0453* (0.0253)	-0.00506 (0.0351)	-0.306 (0.206)	-0.127 (0.143)	-0.363* (0.213)
Secondary education	0.226** (0.108)	0.292* (0.177)	0.226** (0.108)	1.032*** (0.227)	1.022** (0.409)	1.047*** (0.229)
University education	1.569*** (0.222)	1.903*** (0.311)	1.569*** (0.222)	3.734*** (0.499)	4.366*** (0.761)	3.749*** (0.499)
Woman*Secondary education	-	-0.108 (0.223)	-	-	0.0506 (0.473)	-
Woman*University education	-	-0.891** (0.418)	-	-	-1.323 (0.883)	-
Children in the household	-0.0132 (0.0412)	-0.0197 (0.0408)	-0.0250 (0.0809)	-0.441 (0.287)	-0.455 (0.291)	-1.280*** (0.397)
Woman*Children in the household	-	-	0.0206 (0.0866)	-	-	1.444** (0.565)
Constant	4.133** (1.701)	4.361** (1.706)	4.144** (1.707)	5.674 (7.394)	5.244 (7.323)	5.865 (7.391)
R-squared	0.092	0.098	0.092	0.129	0.132	0.130
Observations	4,836	4,836	4,836	3,222	3,222	3,222

Note: Robust standard errors in parentheses. Data sources are time-use surveys from Mexico (2014) and Chile (2015). The sample is restricted to individuals aged 65 and older. Primary education is equivalent to having less than a secondary school diploma. Secondary education is equivalent to having a secondary school diploma. University education is equivalent to having more than a secondary school diploma. Children in the household, represents the presence of children in the household with an age range between 5 and 17 years * Significant at 90%. ** Significant at 95%. *** Significant at 99%.

APPENDIX

Table A1. OLS regressions on the time devoted to Internet activities

VARIABLES	Mexico			Chile		
	(1) Internet	(2) Internet	(3) Internet	(4) Internet	(5) Internet	(6) Internet
Woman	-0.00363 (0.0325)	0.0453* (0.0253)	-0.00506 (0.0351)	-0.306 (0.206)	-0.127 (0.143)	-0.363* (0.213)
Age	-0.108** (0.0454)	-0.115** (0.0456)	-0.109** (0.0455)	-0.101 (0.189)	-0.0913 (0.188)	-0.105 (0.189)
Age squared	0.0720** (0.0297)	0.0760** (0.0299)	0.0722** (0.0298)	0.0402 (0.121)	0.0330 (0.120)	0.0419 (0.121)
Household income	4.52e-05 (3.03e-05)	4.29e-05 (3.11e-05)	4.52e-05 (3.03e-05)	7.62e-05 (0.000290)	0.000127 (0.000294)	7.39e-05 (0.000292)
Retirement income	- -	- -	- -	0.000620 (0.000507)	0.000555 (0.000525)	0.000589 (0.000510)
Partner	0.0344 (0.0339)	0.0288 (0.0343)	0.0346 (0.0340)	0.399** (0.166)	0.381** (0.166)	0.411** (0.166)
Other members in the household >18	-0.125*** (0.0438)	-0.124*** (0.0435)	-0.125*** (0.0437)	-0.0325 (0.175)	-0.0445 (0.172)	-0.0392 (0.175)
Indigenous	-0.0199 (0.0261)	-0.0164 (0.0257)	-0.0198 (0.0260)	-0.0476 (0.321)	-0.00589 (0.321)	-0.0611 (0.321)
Locality (more than 100,000 people)	0.150*** (0.0461)	0.147*** (0.0461)	0.150*** (0.0462)	- -	- -	- -
Secondary education	0.226** (0.108)	0.292* (0.177)	0.226** (0.108)	1.032*** (0.227)	1.022** (0.409)	1.047*** (0.229)
University education	1.569*** (0.222)	1.903*** (0.311)	1.569*** (0.222)	3.734*** (0.499)	4.366*** (0.761)	3.749*** (0.499)
Woman*Secondary education	- -	-0.108 (0.223)	- -	- -	0.0506 (0.473)	- -
Woman*University education	- -	-0.891** (0.418)	- -	- -	-1.323 (0.883)	- -
Children in the household	-0.0132 (0.0412)	-0.0197 (0.0408)	-0.0250 (0.0809)	-0.441 (0.287)	-0.455 (0.291)	-1.280*** (0.397)
Woman*Children in the household	- -	- -	0.0206 (0.0866)	- -	- -	1.444** (0.565)
Constant	4.133** (1.701)	4.361** (1.706)	4.144** (1.707)	5.674 (7.394)	5.244 (7.323)	5.865 (7.391)
R-squared	0.092	0.098	0.092	0.129	0.132	0.130
Observations	4,836	4,836	4,836	3,222	3,222	3,222

Note: Robust standard errors in parentheses. Data sources are time-use surveys from Mexico (2014) and Chile (2015). The sample is restricted to individuals aged 65 and older. Primary education is equivalent to having less than a secondary school diploma. Secondary education is equivalent to having a secondary school diploma. University education is equivalent to having more than a secondary school diploma. Children in the household, represents the presence of children in the household with an age range between 5 and 17 years. In our estimates, for control variables we include the region of residence of individuals. In Mexico we consider four regions (Centre, West-Centre, North, and South-South-East) and in Chile we consider six regions (Norte Grande, Norte Chico, Central Nucleus, Concepción and La Frontera, Region of the Lakes, and Region of the Channels). * Significant at 90%. ** Significant at 95%. *** Significant at 99%

Table A2. OLS regressions on the time devoted to Internet activities considering education levels

	Mexico	Chile
VARIABLES	(1) Internet	(2) Internet
Man	-0.0453* (0.0253)	0.127 (0.143)
Age	-0.115** (0.0456)	-0.0913 (0.188)
Age squared	0.0760** (0.0299)	0.0330 (0.120)
Household income	4.29e-05 (3.11e-05)	0.000127 (0.000294)
Retirement income	- -	0.000555 (0.000525)
Partner	0.0288 (0.0343)	0.381** (0.166)
Other members in the household >18	-0.124*** (0.0435)	-0.0445 (0.172)
Indigenous	-0.0164 (0.0257)	-0.00589 (0.321)
Locality (more than 100,000 people)	0.147*** (0.0461)	- -
Secondary education	0.184 (0.136)	1.073*** (0.236)
University education	1.012*** (0.278)	3.043*** (0.536)
Man*Secondary education	0.108 (0.223)	-0.0506 (0.473)
Man*University education	0.891** (0.418)	1.323 (0.883)
Children in the household	-0.0197 (0.0408)	-0.455 (0.291)
Constant	4.406*** (1.706)	5.116 (7.310)
R-squared	0.098	0.132
Observations	4,836	3,222

Note: Robust standard errors in parentheses. Data sources are time-use surveys from Mexico (2014) and Chile (2015). The sample is restricted to individuals aged 65 and older. Primary education is equivalent to having less than a secondary school diploma. Secondary education is equivalent to having a secondary school diploma. University education is equivalent to having more than a secondary school diploma. Children in the household, represents the presence of children in the household with an age range between 5 and 17 years. In our estimates, for control variables we include the region of residence of individuals. In Mexico we consider four regions (Centre, West-Centre, North, and South-South-East) and in Chile we consider six regions (Norte Grande, Norte Chico, Central Nucleus, Concepción and La Frontera, Region of the Lakes, and Region of the Channels). * Significant at 90%. ** Significant at 95%. *** Significant at 99%