# Determinants of Online and Offline Social Support Among Older Adults

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**Abstract**—Scholars have found that the use of Information and Communication Technologies (ICTs) by older populations is related to an enhanced quality of life. This is believed to result from the emotional support and access to information that these technologies offer. Social Network Sites (SNS) play an important role among ICT resources that older adults have access to, as they help older adults to overcome perceptions of social isolation and loneliness. For this work we use data from the Facebook Marketing Application Programming Interface (API) and from the Survey for Health, Ageing and Retirement in Europe (SHARE) to study the characteristics that, (1) explain older people's use of internet and Facebook; and (2) explain older people's social support. Preliminary results suggest that Facebook does not act as an equalizer: highly educated older people have more friends both online and offline. However, social network sites seem to open opportunities for older women, who may compensate for the lack of offline networks with larger online ones, when they are either migrants or mothers of migrants. Methodologically, we provide a novel approach to analyze and interpret publicly available Facebook data with standard statistical tools.

## 1 Introduction

Scholars have found that the use of Information and Communication Technologies (ICTs) by older populations is related to an enhanced quality of life (Barbosa Neves & Vetere, 2019; Barbosa Neves, 2015). This is believed to result from the emotional support and access to information that these technologies offer. Social Network Sites (SNS) play an important role among ICT resources that older adults have access to, as they help older adults to overcome perceptions of social isolation and loneliness (Francis, Ball, Kadylak, & Cotten, 2019; Hill, Betts, & Gardner, 2015). Studies of SNS usage by older adults have mainly been performed through surveys in the UK and USA. However, the population is ageing globally and therefore the ICT impact on well-being ought to be studied in a broader comparative perspective. In this work we use data from Facebook and from the Survey of Health, Ageing and Retirement in Europe (SHARE) to study the characteristics that (1) explain older people's use of internet and Facebook; and (2) older people's social support.

Since the beginnings of the discipline, demographers have used survey data to study population dynamics. Such source of information can be expensive and may become available to researchers only with a significant delay between data collection and dissemination. The digital revolution has created new opportunities to collect demographic data in a less expensive and less time intensive way . Even though such platforms were not conceived for research purposes, the fast growth of their user numbers worldwide has allowed researchers to consider them as a new data source in demographic research. The most frequently used SNS worldwide is Facebook with more than two billion users (Nowak, 2017). Therefore, it can be considered a first approximation of access to SNS. The use of this data has clear advantages for demographic research. For example, it offers ways to obtain information about subpopulations that are otherwise difficult to reach and to study. As such, Facebook data have already been used to study access to digital technologies (Fatehkia, Kashyap, & Weber, 2018), immigrant's cultural assimilation (Stewart, Flores, Riffe, Weber, & Zagheni, 2019; Dubois, Zagheni, Garimella, & Weber, 2018), and to estimate migrant stocks across countries (Zagheni, Weber, & Gummadi, 2017).

In what follows, we first give a general background of the ideas underpinning the work. We then introduce the two databases used for the analyses and explain the methodological approach. After showing the results obtained from the analyses of each database, we summarize the findings and conclude. This paper aim to contribute in two ways; methodologically, showing how data from the Facebook Marketing Application Programming Interface (API) can help to understand individual characteristics of the population, albeit its aggregated nature; substantially, showing how digital trace data can complement survey information, when we are studying a hard to reach population.

## 2 Background

Loneliness and social isolation are among the major hazards to older people's well-being (Gierveld, van Tilburg, & Dykstra, 2006). Loneliness is the subjective feeling of lack or loss of companionship (Gierveld, 1998), while social isolation refers to an objective social situation of lack of relationships (Dykstra, 2009). The health impacts of loneliness and social isolation are widely recognized (e.g., Malcolm, Frost, & Cowie, 2019). Therefore, some researches have explored how the use of ICT, in particular internet and SNS, could help older adults to overcome them. Though results vary depending on the type of ICT older adults have access to and their openness to use them (Blaschke, Freddolino,

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& Mullen, 2009; Damant, Knapp, Freddolino, & Lombard, 2017) a common result, among those that use internet, is that the use of internet benefits their quality of life.

The literature has identified social capital as an important resource to maintain well-being in later life. Despite several definitions have been used in previous studies (Sum, Mathews, Pourghasem, & Hughes, 2008; Neves, 2013; Barbosa Neves, 2015), the common idea is that social capital consists of the resources that are potentially available from people's social network and that in turn relate with health outcomes. As Smith and Christakis (2008, p. 406) remarks *"Social networks affect health through a variety of mechanisms, including (a) the provision of support, (b) social influence, (c) social engagement, (d) person-to-person contacts, and (e) access to resources."*. This ideas found digital backup in Burke and Kraut's work, where they showed through a representative Facebook survey that online interactions influence well-being, and that *"... people derive benefits from online communication, as long it comes from others they care about and has been tailored for them."*(2016, p. 279). Therefore, this dimension of well-being is important, given that older adults' perceptions and experiences of social connectedness in home and community (Waycott, Vetere, & Ozanne, 2019) can be leverage through the use of internet and SNS.

Digital technologies are also likely to affect well-being indirectly by facilitating positive feelings which in turn contribute to increased levels of well-being. Hill et al. (2015) found that older adults recognized digital technologies as facilitating their daily activities and helping them maintaining social relationships by helping them to overcome physical and geographical barriers associated with aging. In particular, Facebook has found to be used by older people mainly as a means to social bonding, i.e. to stay connected with family, to keep in touch with old friends, and to maintain relationships with people they do not get to see very often (Jung & Sundar, 2016).

## 3 Data

In this work we decided to use, and build, representative databases that could help us to analyze, and contrast, the use of internet and SNS by older people and the characteristics of their online and offline social support. First using SHARE, and second through the Facebook Marketing API data. Though these data have different properties, one is a representative survey and the second one is information about the whole Facebook population.

### 3.1 SHARE Database

SHARE is a longitudinal survey whose target population consists of all persons aged 50 years and over who at the time of sampling have their regular domicile in the respective SHARE country. For this study we used wave 6, conducted in 2015 in 17 European countries, because it is the most recent wave including an additional module on Social Networks. Figure 1 shows the ratio of internet users to total population. The countries where older population use internet the most are Denmark, Sweden, and Switzerland. From SHARE we will use the variables showed in Table 1 in order to study the use of internet and their networks.

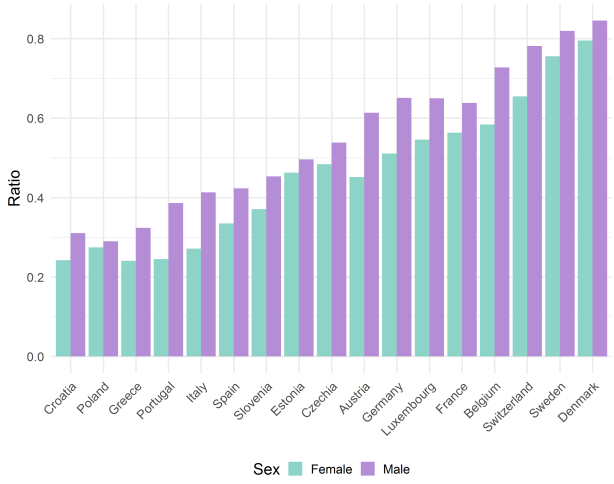



Fig. 1. Bar charts showing the SHARE ratio of internet users age 50 or older to total population split by country and sex.

### 3.2 Facebook Database

The Facebook Marketing API is a platform that, before an add is launched and before any payment is performed, gives advertisers the approximate number of Facebook users that match certain characteristics. This platform was built for marketing purposes, but demographers and sociologists, among others, have found an invaluable resource of information on it. For this work we retrieved the Daily Active Users (DAU) during one month- from June 9 to July 9 2019- that match the combination of the characteristics shown in table 2 [1] [2].

In this way the total number of data points per country that we retrieved per day were $2 \times 2 \times 3 \times 2^4 = 192$. We did this for 31 days, resulting in a database with $31 \times (29 \times 192) = 172,608$ rows. For our study we use the maximum number of DAU per characteristics-combination, so the final database consists of $(27 \times 192) = 5184$ rows. The maximum Facebook DAU value in a month is preferred when we are working with small populations, given that the Facebook Monthly Active Users value has a lower bound of 1000, while the DAU lower bound is 0.

As a visual summary of the database figure 2 shows as bars the maximum Facebook DAU per country. On the one hand, the countries with the largest maximum Facebook DAU over 50 years of age for both genders are Italy, France, Spain, and Germany. On the other hand, the countries that show the highest Facebook penetration rates are Malta, Luxembourg, and Denmark for both genders (Fig.3), the denominators come from the respective countries total populations according to United Nations (2017).

Regarding the distribution of the population subsets, Figure 4 shows the composition of the sets broken down by gender and level of education for the population 50 to 64 years old and 65 or older, without considering the

1. The definition of the variables completely depend on Facebook, we do not know how the Facebook algorithms work in order to classify the users as having those characteristics.

2. These subsets are mutually exclusive, therefore the maximum total Facebook DAU population in each country age 50 or older can be rebuilt as the sum of all of them.

| SHARE Variable | New Name | Definition |
|---|---|---|
| dn003_ | AGE | Year of birth. With this variable we build the variable AGE, that can be either *50-64* or *65 or more*. |
| dn004_ | EXPAT | Born in the country of interview. We used this variable to build the dummy variable EXPAT, with 1 meaning the person was not born in the country of interview. |
| ch001_ | PARENT | Number of children. It was used to build the dummy variable PARENT, with 1 meaning the person has at least one child. |
| sn009_X | FRIEND | Network closeness. With this variable we build the dummy variable FRIENDS, with one when the person has at least one person with whom she or he feels either *Very close* or *Extremely close*. |
| isced1997_r | EDUCATION | Highest school degree obtained, classification according to ISCED. With this we build the categorical variable EDUCATION, which categories are:<br>• Below College: either ISCED-97 code 1, ISCED-97 code 2, ISCED-97 code 3, ISCED-97 code 4, or ISCED-97 code 5.<br>• College or Above: ISCED-97 code 6.<br>• Unspecified: either Refusal, Don't know, None, Other, or Still in school. |
| it004_ | INTERNET | Use of internet. This is a dummy variable of whether the person used internet during the past 7 days, either for e-mailing, searching for information, making purchases, or for any other purpose at least once. With one meaning `yes` and zero `no`. |

TABLE 1
Variables with new names and definitions from SHARE

| Variable | Definition |
|---|---|
| COUNTRY | Each of the 27 countries show in the Appendix A. |
| SEX | The gender that the Facebook user specified, either *female* or *male*. |
| AGE | Either *50 to 64 years old* or *65 or above years old*. |
| EDUCATION | *Below college*, *college or above*, or *unspecified*. |
| EXPAT | Dummy variable representing whether the user is *expat*. |
| PARENT | Dummy variable representing whether the user is *parent*. |
| FAMEXPAT | Dummy variable representing whether the user is *family of expat*. |
| FRIENDS | Dummy variable representing whether the user is *close friend of people with birthdays in a month*. |

TABLE 2
Facebook variables and definitions

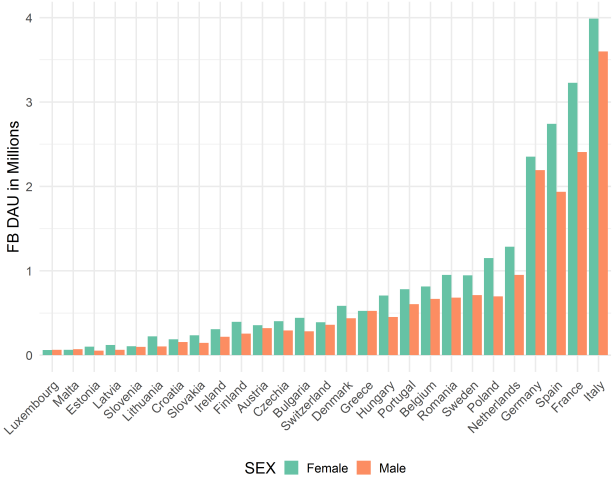



Fig. 2. Bar charts showing the Facebook DAU age 50 or older split by country and sex by million users.

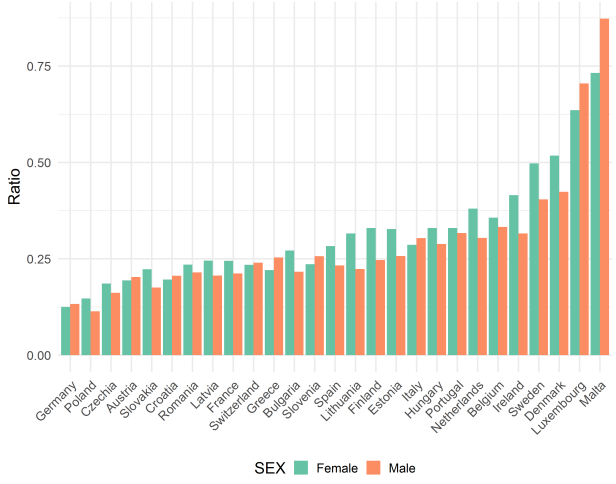
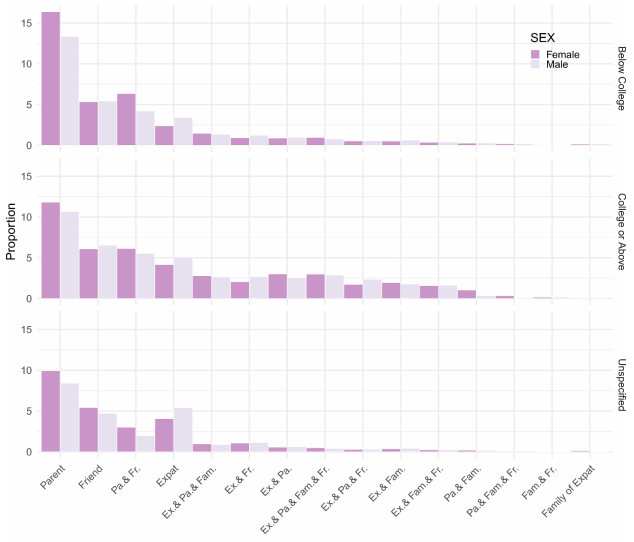


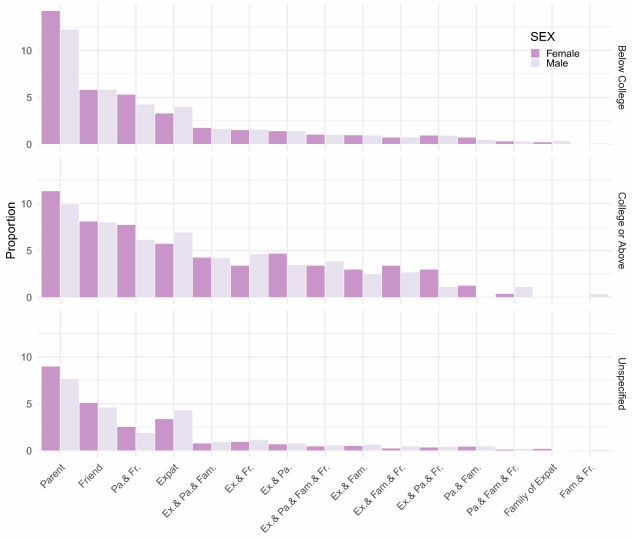

Fig. 3. Bar charts showing the ratio of Facebook DAU age 50 or older by UN's total population split by country and sex.

subset of Facebook DAU that are not EXPAT, PARENT, FAMEXPAT, nor FRIENDS, because this subset is the biggest one with around 50% of the observations. As said before, there are four dummy variables, therefore we have 16 possible combinations of these ones. So, we summarize these combinations with the acronyms Expat (Ex.), Parent (Pa.), Family of expat (Fam.), and Friend (Fr.), this way having all the characteristics is symbolized "Ex.&Pa.&Fam.&Fr." and just having one characteristic with just one acronym.

As these figures show, the subsets with the highest numbers of DAU, without considering the population that do not match any characteristic, notwithstanding the age




(a) 50 to 64 years old




(b) 65 and over

Fig. 4. Bar charts illustrating the distribution of the Facebook DAU population subsets

are:

1) Just being PARENT (Pa.)
2) Just being FRIEND (Fr.)
3) Just being PARENT and FRIEND (Pa. & Fr.)
4) Just being EXPAT (Ex.)

The correlation between the proportion of Facebook users by total population -using United Nations (2017) for the denominators- and the proportion of internet users by total population -wave 6 SHARE data - is 0.4108.

## 4 Methodology

In order to analyze the offline characteristics, we used the already described SHARE variables (Tab.1). First we studied older people's use of internet, this was done using logit models to measure the impact of being EXPAT, PARENT, and FRIEND have on the probability of being an internet user. Then we analyze the variable FRIEND as a proxy of support.

The online dimension was analyzed using the Facebook DAU data, for this we used logit models. One important reason for using logit models is, that the Facebook data is aggregated data, therefore the Maximum Likelihood estimates and standard errors are the same if we use the $1/0$ individual outcome or if we aggregate them according to their categorical independent variables[3]. An important drawback in the analysis is the lack of information regarding those who do not use Facebook. Therefore, we cannot compare the characteristics of those using Facebook against those that do not use it. But we can describe the Facebook population measuring the association of the different variables (Tab.2) on the probabilities of being a female user (SEX), PARENT, and EXPAT independently.

The analyses were performed differentiating by age, 50-64 and 65 or more, because we expect to have different results for the none-retired population and retired. The models were run using the `base` library of the statistical software R (R Core Team, 2019).

## 5 Results

### 5.1 SHARE

We summarize the results from the logit models for the use of internet in Fig.5. For these models the base values are for the population that are men with education below college and that are not parents, do not have close friends, and are not expats.

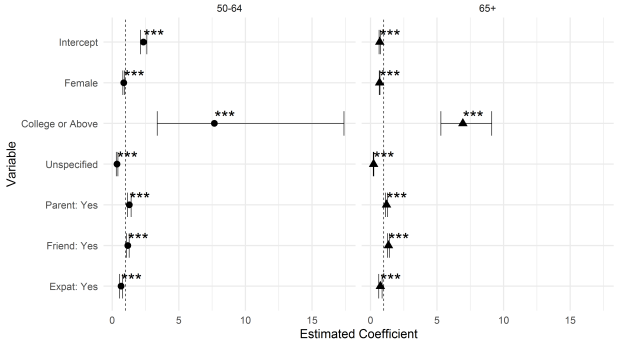



Fig. 5. Exponential of the estimated coefficients and standard errors of the different internet logit models using individual level data from SHARE. They include their corresponding confidence interval. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. The dashed lines corresponds to the one x axis intersection.

On the one hand, for the population aged between 50 and 64, we found that the base odd of being an internet user is 2.3428, this gives a probability of $2.3428/(1+2.3428) = 0.70$ of being an internet user. In the case of the older women the odd decreases to $2.3428 \times 0.8573 = 2.008482$ giving a probability of about 67%. These probabilities increase for those who have an education of college or above, are parents, and have close friends. Surprisingly, being an expat decreases the odds. On the other hand, for the retired population the base probability is 40% and it decreases to 32% for the female population. The maximum probability (89%)

3. For more information check Agresti (2013, chap. 4, example 4.2.2)

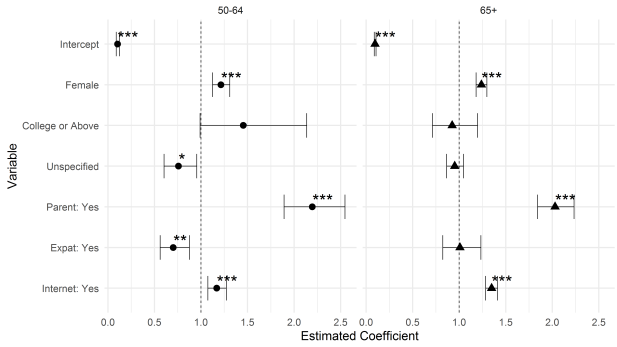



Fig. 6. Exponential of the estimated coefficients and standard errors of the different friend logit models using individual level data from SHARE. They include their corresponding confidence interval. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. The dashed lines corresponds to the one x axis intersection.

is reached when the population are fathers, with college or above, and have close friends; in the case of mothers with education of college or above that have close friends, the probability decreases 4 percentage points.

Regarding the effect of having close friends, the base probabilities are 9.4% and 8.8% for the 50-64 and 65+ group respectively. For the group of age between 50 and 64, we have that the maximum probability ($\sim$ 32%) of having close friends is reached when moving to being women, being parent, and using internet. For the group 65 or more, moving to being women, being parent, and internet user gives a maximum probability of 25%. For both ages, the education level does not show any significance on the odds; for the case of the retired population being expat does not show any significance.

### 5.2 Facebook

The results from the four logit models are summarized in the tables 5 and 6 of Appendix B. Figures 7 and 8 show a visual summary of them.

For all the models the base values are for the population that with education below college and that do not have any of the target characteristics, i.e. not women, not PARENT, not FRIEND, not EXPAT, and not FAMEXPAT- the variables depend on whether they are part of the model or not. In this case, we are treating the aggregated population as the weights of the logit model, this must give the same as if we were using individual data, given maximum likelihood properties (Agresti, 2013, chap. 4, example 4.2.2).

For the first model (SEX), we found that the base probabilities for the 50 to 64 and 65 or more groups are 54% and 51%, respectively, meaning that both women and men are equally likely to be Facebook users when their education is below college and they are neither parents, expats, family of expats, nor have friends with birthdays in a month. These values decrease about four percentage points when moving from below college to college or above for both populations 50 to 64 and 65 and over; and increases 3 and 6 percentage points respectively when moving to unspecified; meaning that the probability of being a female Facebook user is higher for the below college and unspecified education populations. On one hand, being either mother or friend

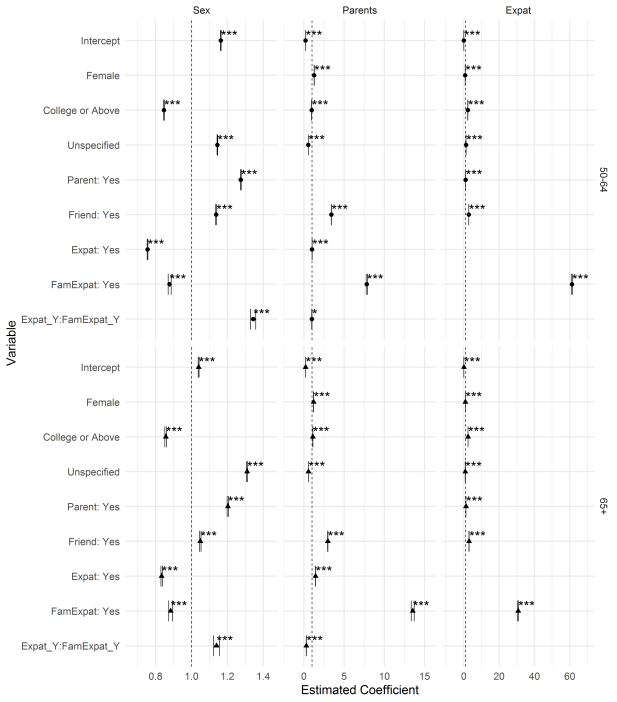



Fig. 7. Exponential of the estimated coefficients and standard errors of the logit models for sex, parent, and expat, using aggregated level data from Facebook with correspondent confident intervals. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. The dashed lines corresponds to the one x axis intersection.

of people with birthdays in a month give a probability of 63% and 58% being a female Facebook user with education below college for the none-retired and retired populations respectively. On the other hand, being either expat or family of expat decreases the odds of being a female Facebook user to 50% for the retired population and 46.5% for the none-retired one.

In the case of being parent (PARENT), we found that being either FRIEND, or FAMEXPAT increases the odds of being a parent Facebook user, in contrast with the previous model, moving from below college to college or above does not show a significance difference in the odds of being a Facebook parent user. For this model, one important highlight is that being FAMEXPAT has a high impact on the odds of being a parent Facebook user, with an increase of 7 and 13 times the base odds of the populations age 50 to 64 and 65 or more respectively. The probability of being a parent Facebook user reaches its maximum, about 90%, when the users are women, with education bellow college, FRIENDS, FAMEXPAT irrespective of the age group.

For EXPAT model, we have that the odds of being EXPAT increase 62 and 31 times when the user is FAMEXPAT for the Facebook users between ages 50 to 64 and 65 or more respectively, this shows how being an EXPAT in Facebook is highly related with having family that is also consider as expat by Facebook. For both age groups being woman decreases the odds of being an EXPAT Facebook user; in the case of 65 or more moving from below college to college or above duplicates the odds for both age groups.

Considering FRIEND as a proxy of the online social capital, we can interpret the respective model as the probability

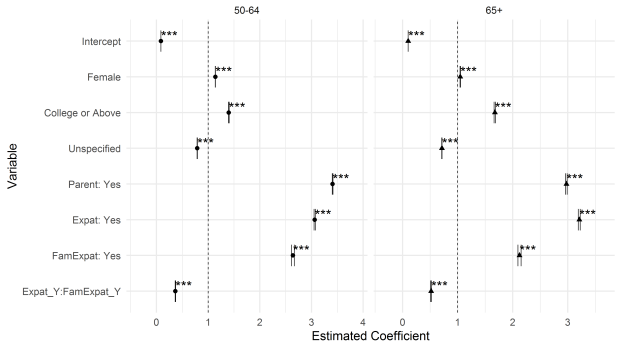



Fig. 8. Exponential of the estimated coefficients and standard errors of the friend logit models using aggregated level data from Facebook with correspondent confident intervals. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1. The dashed lines corresponds to the one x axis intersection.

of being a user with online social capital. So, the odds of being a user with online social capital reaches its maximum when the users match all the characteristics and have an education of college or above, with a probability of about 60%, otherwise the probabilities remain bellow 50%, for both age groups.

## 6 Discussion

The first goal of this work was to understand the set of characteristics that explain older people's use of internet and Facebook. In the case of being an internet user, this is more probable among the none-retired population, this might be related with being more use to technology, derived from using them in their daily work (Kiel, 2005). In the case of both retired and none-retired populations, we found that having an education of college or above is the most important characteristic, increasing the odds six or more times, this result was also found in previous literature (Lee, Chen, & Hewitt, 2011). For both populations we also found that, having close friends and being parent have a positive association on being an internet user, this remains unexplain and requires future research; being woman is related with a decrease on the probability of being a user. Given Hill et al. (2015) findings, we expected that being expat had a positive effect on being an internet user, but for both populations it was negative.

The Facebook analysis is constrained to a description of what characteristics make certain subgroups more likely to be Facebook users, given the lack of data regarding older people that do not use Facebook. First, for female Facebook users, we found that in general it is more probable to find either less educated women or those who do not specify their level of education, and that these probabilities are maximized when they are mothers and have close friends with birthdays in a month; otherwise the chances that a Facebook user is either woman or man are equal. Second, being a parent in Facebook is associated with having close friends with birthdays in a month and that the odds increase significantly when the user is family of expat, supporting the statement that older people use Facebook to keep in touch with their families. And for the last characteristic, expat, we have that this is highly related with being family of expat.

The second goal of our work was to study the characteristics that are associated with older people's offline and online social support, which may indicate an increase of social capital. We found a significant relation between having close friends and both being a parent and use internet, and this is more expected to happen for women. So, it can be said that the chances of having access to social capital are higher for mothers who use internet, notwithstanding the age.

In the case of Facebook, we found that having close friends in Facebook is also related with being a mother, and that in contrast with the offline perspective, this significantly increases when the user has an education of college or above and is either an expat or a family of expat. So, the chances of having online social capital are higher for older women with education of college or above, that are either expats and mothers or mothers of expats. These findings are in accordance with our previous results (Gil-Clavel & Zagheni, 2019).

## 7 Acknowledgment

This paper uses data from SHARE Waves 6 (DOI: 10.6103/SHARE.w6.700), see (Börsch-Supan et al., 2013) for methodological details.[4]

## 8 Reproducibility

All the codes for replicating this work will be available in Gil-Clavel's github repository. Given the private policy terms from Facebook and SHARE we do not share the databases.

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## APPENDIX A

List of countries that constitute the bases:

- Bulgaria
- Czechia
- Hungary
- Poland
- Romania
- Slovakia
- Denmark
- Estonia
- Finland
- Ireland
- Latvia
- Lithuania
- Sweden
- Switzerland
- Croatia
- Greece
- Italy
- Malta
- Portugal
- Slovenia
- Spain
- Austria
- Belgium
- France
- Germany
- Luxembourg
- Netherlands

## APPENDIX B

| Variable | 50-64 | | 65+ | |
|---|---|---|---|---|
| Intercept | 2.3428 | *** | 0.6941 | *** |
| | (1.0546) | | (1.0338) | |
| Female | 0.8573 | *** | 0.6828 | *** |
| | (1.0358) | | (1.0194) | |
| College or Above | 7.6660 | *** | 6.9360 | *** |
| | (1.5196) | | (1.1488) | |
| Unspecified | 0.3599 | *** | 0.2243 | *** |
| | (1.0898) | | (1.0531) | |
| Parent: Yes | 1.2741 | *** | 1.1974 | *** |
| | (1.0548) | | (1.0338) | |
| Friend: Yes | 1.1676 | *** | 1.3476 | *** |
| | (1.0444) | | (1.0244) | |
| Expat: Yes | 0.6646 | *** | 0.7350 | *** |
| | (1.0906) | | (1.0911) | |

TABLE 3
Exponential of the estimated coefficients and standard errors of the logit models of being an internet user - SHARE. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

| Variable | 50-64 | | 65+ | |
|---|---|---|---|---|
| Intercept | 0.1042 | *** | 0.0959 | *** |
| | (1.0861) | | (1.0525) | |
| Female | 1.2136 | *** | 1.2377 | *** |
| | (1.0396) | | (1.0242) | |
| College or Above | 1.4548 | . | 0.9238 | |
| | (1.2165) | | (1.1414) | |
| Unspecified | 0.7585 | * | 0.9513 | |
| | (1.1241) | | (1.0493) | |
| Parent: Yes | 2.1958 | *** | 2.0289 | *** |
| | (1.0788) | | (1.0505) | |
| Expat: Yes | 0.7012 | ** | 1.0075 | |
| | (1.1199) | | (1.1083) | |
| Internet: Yes | 1.1687 | *** | 1.3475 | *** |
| | (1.0444) | | (1.0244) | |

TABLE 4
Exponential of the estimated coefficients and standard errors of the logit models of having close friends - SHARE. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

| Variable | Sex | | Parents | | Expats | |
|---|---|---|---|---|---|---|
| Intercept | 1.1632 | *** | 0.2091 | *** | 0.057 | *** |
| | (1.0006) | | (1.0009) | | (1.0015) | |
| Female | - | | 1.2762 | *** | 0.7723 | *** |
| | | | (1.001) | | (1.0015) | |
| College or Above | 0.8462 | *** | 0.9614 | *** | 2.2884 | *** |
| | (1.002) | | (1.0024) | | (1.0031) | |
| Unspecified | 1.1442 | *** | 0.5359 | *** | 1.2673 | *** |
| | (1.0008) | | (1.001) | | (1.0015) | |
| Parent: Yes | 1.2746 | *** | - | | 1.022 | *** |
| | (1.001) | | | | (1.0019) | |
| Friend: Yes | 1.1372 | *** | 3.4102 | *** | 2.804 | *** |
| | (1.0012) | | (1.0012) | | (1.0018) | |
| Expat: Yes | 0.7551 | *** | 1.014 | *** | - | |
| | (1.0015) | | (1.002) | | | |
| FamExpat: Yes | 0.8778 | *** | 7.8186 | *** | 61.2241 | *** |
| | (1.0049) | | (1.0053) | | (1.0029) | |
| Expat_Y:FamExpat_Y | 1.3437 | *** | 0.9857 | * | - | |
| | (1.0055) | | (1.0062) | | | |

TABLE 5

Exponential of the estimated coefficients and standard errors of the different logit models for Facebook DAU age 50-64. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

| Variable | Sex | | Parents | | Expats | |
|---|---|---|---|---|---|---|
| Intercept | 1.0396 | *** | 0.1984 | *** | 0.0728 | *** |
| | (1.0011) | | (1.0017) | | (1.0024) | |
| Female | - | | 1.202 | *** | 0.8463 | *** |
| | | | (1.0017) | | (1.0023) | |
| College or Above | 0.8563 | *** | 1.1026 | *** | 2.4125 | *** |
| | (1.0031) | | (1.0036) | | (1.0042) | |
| Unspecified | 1.3092 | *** | 0.5515 | *** | 0.8351 | *** |
| | (1.0013) | | (1.0017) | | (1.0024) | |
| Parent: Yes | 1.2026 | *** | - | | 1.2291 | *** |
| | (1.0017) | | | | (1.0028) | |
| Friend: Yes | 1.049 | *** | 2.9686 | *** | 2.961 | *** |
| | (1.0019) | | (1.0021) | | (1.0027) | |
| Expat: Yes | 0.8334 | *** | 1.4376 | *** | - | |
| | (1.0024) | | (1.0029) | | | |
| FamExpat: Yes | 0.8836 | *** | 13.5369 | *** | 30.7747 | *** |
| | (1.006) | | (1.0069) | | (1.0038) | |
| Expat_Y:FamExpat_Y | 1.139 | *** | 0.2903 | *** | - | |
| | (1.0071) | | (1.0082) | | | |

TABLE 6

Exponential of the estimated coefficients and standard errors of the different logit models for Facebook DAU age 65+. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.

| Variable | 50 - 64 | | 65 + | |
|---|---|---|---|---|
| Intercept | 0.0853 | *** | 0.1001 | *** |
| | (1.0012) | | (1.002) | |
| Female | 1.1387 | *** | 1.0457 | *** |
| | (1.0012) | | (1.0019) | |
| College or Above | 1.3995 | *** | 1.6738 | *** |
| | (1.0026) | | (1.0037) | |
| Unspecified | 0.7883 | *** | 0.7135 | *** |
| | (1.0012) | | (1.002) | |
| Parent: Yes | 3.4087 | *** | 2.9746 | *** |
| | (1.0012) | | (1.0021) | |
| Expat: Yes | 3.0613 | *** | 3.2085 | *** |
| | (1.0018) | | (1.0029) | |
| FamExpat: Yes | 2.6398 | *** | 2.123 | *** |
| | (1.0052) | | (1.0067) | |
| Expat_Y:FamExpat_Y | 0.3661 | *** | 0.5174 | *** |
| | (1.006) | | (1.0079) | |

TABLE 7

Exponential of the estimated coefficients and standard errors of the friend logit model for Facebook DAU. Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1.