Mobile life and family. The impact of ICTs on spatial-geographic mobility[a]

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Abstract

The family is in a constant process of adaptation to the structural changes brought about by the *network society*, such as the digitalization of social relationships as a result of the extension of Information and Communication Technologies (ICTs). The aim of this study is to examine the process of spatial-geographic mobility in Spain supported by ICTs within the family. To meet this objective, data from two studies by the Spanish Center for Sociological Research (2015 and 2016) focused on understanding the *Impact of ICTs on the Family in Spain* were analyzed. The results indicate that the probability of moving geographically is greater when instant messaging software and digital social networks are used within the family. Differences are found in sociodemographic and social status factors. The probability of moving geographically increases when the use of ICTs enables families to become more efficient and competent and when their social capital increases.

Keywords: family, spatial and geographic mobility, information and communication technologies, social networks, digital networks.

1. Introduction

This article examines the potential influence of ICT use on geographic mobility processes and the association with family dynamics. Based on this premise, we seek to understand whether the use ICTs, when geographic mobility occurs, can be interpreted in terms of increasing social capital and its benefits (Requena, 2003, 2008; Pigg & Crank, 2004), greater technological competence in motility processes (Kaufman, 2002) and as an explanatory element of the social changes produced in the context of mobile lives (Elliot

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and Urry, 2010), in the family dynamics themselves (Kaufmann & Widmer, 2006; Hannam, Sheller and Urry, 2006; Lanigan, Bold & Chenoweth, 2009, Beck and Beck-Gernsheim, 2013; Ayuso, 2019) or the emergence of forms of the social digital divide (Norris, 2001; Cabero, 2004).

The geographic setting for this study is Spain. Although it has been demonstrated that individuals who move geographically are more likely to develop upward social mobility (Requena, 2005; Yaish & Andersen, 2012), geographic mobility in Spain for many years has not exceeded 25% of those employed, with important regional differences (Bentolila, 1997) influenced by residential dynamics and sociodemographic characteristics (Módenes & López-Colas, 2014). Nevertheless, the predisposition to move geographically has increased in Spain as a consequence of the globalization process, with an important impact on the younger population (Meil, 2010, 2014a).

The interest in studying the Spanish case is motivated by the fact that, due to the widespread use of ICTs in family environments, the emotional costs of long-distance relationships associated with mobility processes are reduced. ICTs increase communication and interconnection among family members, thus responding to the demands of increased geographical mobility (Ayuso, 2015, 2019) in the global network society (Castells, 2006), where individual qualities, coupled with family and domestic factors have significant impacts on these geographical mobility processes (Nivalainen, 2010). Spain is also among the European Union countries with the greatest Internet connectivity (in 2018, ranking 10th out of 28 on the European Commission's Digital Economy and Society Index) and worldwide has the highest use of online social networks (according to the 2016 Connected Life study by Kantar TNS). Thus, Spain is a society in which face-to-face interaction is being complemented by new forms of interpersonal contact (Wellman et al., 2001; Requena & Ayuso, 2018) and where real contexts are giving way to virtual contexts of interaction mediated by technologies adding to online interactions those that were pre-existing offline (Castells, 2001), without losing sight of the fact that face-to-face social relationships continue to be crucial for sociability and subjective well-being in Spain (Requena, 2010).

The virtual connection of families and the increasingly frequent virtual journeys made through a screen complement physical journeys and are changing the very nature of the co-presence (Urry, 2002) of their members. Rather than being a disadvantage, new technologies, when part of family relationships, generate all types of benefits by: improving family coordination (Castells, 2006); allowing families to become more competent (digitally) and effective (in their daily activities); helping to improve communication with physically distant relatives (Hannam et al., 2006); and expanding the network of relationships - of friendships (Requena, 2008). Nonetheless, not everything is positive, since differentiated ICT use, taking into account not only perceived usefulness, ease of use and attitude towards technology, but also social stratification factors (Torres et al., 2017), is generating a new social digital divide in Spain in contexts of greater geographic mobility.

The objective of this study is therefore to examine to what extent geographic mobility processes in Spain have been strengthened as a consequence of the use of ICTs (hardware and software) in the family, while also striving to establish to what extent these mobility processes are explained by variables associated with sociodemographics, status and the impact of ICT use on Spanish families.

2. Theoretical framework

2.1. Spatial-geographic mobility, motility and family dynamics

New technologies applied to online social relationships transform the way everyday life is organized as perceptions of space, time, relationships and social practices are reconfigured. One of these transformations occurs in the processes of spatial mobility, which are increasingly complex, faster and framed within a context of demand for instantaneous change (Elliot and Urry, 2010). All this takes place in the society of the knowledge economy, where individuals are asked to be increasingly available to move geographically as a requirement for adaptation to the structures of development in the global information age, with its demands for innovation and competitiveness (Castells & Himanen, 2014).

In this context, individuals can engage in different types of geographic-spatial mobility. A basic classification distinguishes between internal movements that occur within the same territory (Recaño, 2016), external movements into other territories with, in general, permanent or long-term change of residence (Recchi et al, 2019) or, finally, circular movements that take place when there is displacement of a temporary and/or cyclical nature where there is no change of permanent residence (Meil, 2014b).

Similarly, geographic mobility can be measured in different ways. The first would be to carry out a study of the effective patterns of population movement from one place to another in a given period of time and, for example, for labor reasons (Spanish National Statistics Institute [INE, 2020]). This is the case of the Statistics on Labor and Geographic Mobility published by the INE[b]. Thus, in Spain, the mean percentage of employed persons who have changed their municipality of residence compared the previous year in the period 2012-2020 is 2.6, with a higher percentage in the younger and more highly educated population. This same mean percentage during this same period rises to 4.1 in the unemployed population.

A second form of measuring geographic mobility would be as reported mobility in the framework of a general study through a survey on attitudinal, cultural and social stratification issues. The mobility measured in this study is a proxy for actual mobility; it is mobility studied on the basis of the probable influence of other variables. That is, here we are not measuring movement from one place to another but rather determining whether certain factors are perceived as facilitators of mobility processes (such as ICTs) associated with family dynamics. Surveys to measure geographic mobility processes are frequently used in studies in the European context (Schneider & Meil, 2008; Schneider & Collet, 2010), including to understand transformations in family dynamics (Meil, 2014b).

In addition, beyond these classifications, it has been shown that individual mobility patterns, with a focus on the individualization of movements, can explain behavior patterns of families (here we will see behavior patterns mediated by ICTs), as well as their form and modality (Heiko et al, 2011), generating non-linear family trajectories (Wall et al, 2013). Similarly, there is a need to understand the negative impacts that geographic

[b] All the information concerning these statistics and their results can be accessed at the following link: https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176909&menu=publi&idp=1254735976597 and the latest results at: https://www.ine.es/prensa/emlg_2020.pdf

mobility can have on the family in order to minimize such impacts (Green & Canny, 2003), understanding family dynamics, changes in life cycles and family welfare within the framework of these geographic mobility processes (Cooke, 2008).

Furthermore, spatial-geographic mobility is analyzed not only from the perspective of how many moves have taken place, but also from the perspective of how these moves generate dynamics of social structure transformation from spatial forms that are associated with these structures in the process of social change (Kaufmann, Bergman & Joye, 2004). Thus, we understand mobility in terms of motility (Kaufmann, 2002), as it refers to both cultural and structural characteristics of that which becomes mobile. The three elements of motility are: access to different forms and/or degrees of mobility; the ability to recognize knowledge acquired in order to move; and finally, appropriation regarding whether one recognizes the ability to be mobile or tries to improve in order to obtain the necessary elements for this mobility, elements that are none other than strategies, values, perceptions and habits (Kaufmann et al., 2004; Kaufmann & Widmer, 2006).

Motility becomes a factor of social integration to the extent that its use provides insight into the increasing ways in which people can move in time and space, and the ways in which they occupy that space. Motility can be acquired in the family context in such a way that it will depend on the daily functioning of the family and on the family structures and dynamics (Kaufmann & Widmer, 2006).

Certain family dimensions have an impact on motility or mobile capital: autonomy - fusion as the amount of resources which, although individual, are controlled by the family as a whole and are used by the individual components of that family unit; degree of openness/closure of the family to the outside world in terms of socialization in skills; and regulation, understood as the way in which family members are organized (Kaufmann & Widmer, 2006). Taking these dimensions as a reference (and the competition component of the concept of motility), new technologies have enabled family members to become more skilled and effective in the context of the network society, improving the possibilities of spatial-geographic mobility. That is, the mobility process, being more complex than the geographic movement itself, implies not only access, but also competence in the use of ICTs families with an open and communicative character (with greater capacity for social integration in the network society and the information society).

This leads us to the idea of the virtual connection of families as the materialization of the virtual journey (Urry, 2002) mediated by ICTs. Travel has become a social necessity as a way to achieve proximity and a rich and dense social life in terms of interconnection. Virtual travel is not only a substitute for physical travel, but it is a journey made by means of a screen, which allows one to be present and absent at the same time (Urry, 2002). The virtual journey encourages the interconnection of the physical with the virtual, insofar as experiencing this type of journey favors the physical journey (spatial-geographic mobility).

These dynamics and the effects that ICTs have on families allude to how roles change, new rules are negotiated, limits, cohesion and communication are established in the context of the family structure, and the need for emotional bonding between family members is addressed (Lanigan et al., 2009) even in times of spatial-geographic mobility. Through ICTs, the possibility of leading a family life at a distance increases, changes

occur in social life, the possibility of connecting people who are far away improves, increasing the connectivity of households and families that communicate increasingly on the move (Hannam et al., 2006), thus responding to the growing demand for planning the type of family life desired (Ayuso, 2015). Given this new presence of ICTs in family life, the disadvantage that geographic mobility could have in terms of a probable decrease in contacts and loss of support from the family network is reduced and influences the decision of whether or not to make a move (Mulder, 2018) be it internal, external or circular.

2.2. Social capital and social interaction mediated by ICTs

The current development of ICTs takes place in the context of *the network society* where communications go beyond face-to-face exchanges, without the need for physical presence, and where mobility in the digital environment is increasingly important, sometimes even with the weakening of physical-spatial mobility (Castells, 2006). In this society, individual actors have been able to create their own networks starting with their own lives and projects (Castells & Tubella, 2007) as a result of the omnipresence of the internet where online interaction perpetuates the same self-regulation that exists in the offline world (Robinson, 2007).

This society is undergoing profound changes that can be explained by the transformations taking place in the spatiotemporal conditions in the interactions between its members (Castells, 2001; Lee et al., 2011). Thus, ICTs that facilitate social interaction (mobile telephony, instant messaging software and virtual social networks) influence the development of social capital, capital that is beneficial for those who participate in this society (Putnam, 2002), since it enables the emergence of interpersonal trust, where actors contact each other with the aim of providing security, goods, services or information (Requena, 2003, 2008). The mediation of ICTs helps to create environments that favor the establishment of instrumental social relations and, with this, the accumulation of social capital for community benefit (Pigg & Crank, 2004).

Today, with the extension of everything virtual, the type of interconnection is different as is, initially, the type of social capital. Beyond the classic perspective of Goffman (1956), it is accepted that, without the physical presence of the interlocutor, the participants in the interaction can currently generate communication that is intersubjective (with calls through telephony) or not intersubjective (as a result of the individual interpretation that the reading of a text message on a screen, for example, can imply) (Rettie, 2009). Digital interaction can be as real and personal as that which develops in the physical world, only it is mediated by technology, in a society without the delimitation of spaces, and it must be interpreted as though it were a virtual and effective network of relationships (Requena, 2008), where virtual space becomes relativized (Gergen, 2002) to the extent that the online environment is not very different from the offline environment. Both are linked as a consequence of the expansion of the use of ICTs, where the relationships that exist or existed in the physical environment are strengthened and, in turn, allow the emergence of new social relationships - social connections (Serrano, 2013), in a context where part of one's own identity is generated in the dynamics of online social interaction (Robinson, 2007).

An important part of the interaction processes that we develop online are carried out with our family. The presence of ICTs in these interaction processes therefore allows

individuals to acquire new competences in terms of developing knowledge accumulation strategies through the development of a greater social capital mediated by these technologies (Kline & Konstanze, 2013). This accumulation of knowledge is also technological capital (Selwyn, 2004) that reduces the personal cost of mobility and physical distance from family. Thus, ICTs are associated with mobility, insofar as a new digital nomadism is being created. The classic digital nomad (Makimoto and Manners, 1997) was reminiscent of someone who worked remotely and who, because of his or her work, could move around the world, travel and enjoy leisure activities. The new digital nomad, who continues to move geographically, also takes advantage of ICTs to expand and improve his or her social capital and to merge technologies with everyday life (Büscher, 2014). This strengthens and improves the connection with the family environment and also generates forms of support mediated by these ICTs. ICTs that help develop mobility processes also serve to increase social cohesion through new forms of interconnection (Ling, 2008). These new forms of mediated interconnection foster social interaction and coordination among family members (Castells, 2006). Mobility costs are thereby reduced, at least in terms of satisfying the basic need for interaction with the family.

2.3. The use of ICTs and the social digital divide

In this work we analyze how geographic mobility can be influenced by the use of ICTs, taking into consideration the social implications that this use can generate in terms of the digital divide (DiMaggio et al., 2001) and that would foster the understanding of different types of geographic mobility.

The Technological Acceptance Model (Davis, 1986, 1989) explains the reasons for ICT use based on perceived utility and perceived ease of use. Understanding why a person decides to adopt certain technology involves considering that person's attitudes and mental processes towards this technology. If a person wanted to use the Internet, he or she would analyze the difficulties of its use, and the advantages or disadvantages that this technology could bring in comparison with other technologies. However, as Internet use has become more widespread, the favorable opinion of citizens towards its possibilities and ease of use have become normalized, and other variables such as age and educational level are starting to become relevant and to explain the limitations in the use of ICTs, the frequency of their use and how advanced this use is (Torres et al., 2017). This return to the structural factor allows us to understand how new inequalities are produced in the network society that modify forms of inequality prior to this current model (Robles & Molina, 2007), thus revealing educational, generational or economic inequalities as explanations for the penetration and use of a technology (Torres et al., 2017).

We are therefore in a context in which social differences are explained depending on the position occupied in this new society, in terms of the digital divide (Van Dijk, 2005). We understand this digital divide as an unequal possibility of accessing information, knowledge and education through ICTs, with a combination of factors, not only technological, but also socioeconomic and limiting factors concerning access to these technologies (Serrano & Martínez, 2003). The use of ICTs in today's society leads to a digital divide that goes one step further becoming a social digital divide, since it is produced as a consequence of existing social stratification characteristics. This social digital divide can be explained by the differences between social groups in access to ICTs according to sex, educational level, income (Norris, 2001), age, and employment status

(Cabero, 2004). The presence of these structural variables associated with differences in use justifies their inclusion in an attempt to explain the impact of ICTs on family life in terms of mobility.

2.4. Hypothesis

From the above theoretical framework, it can be concluded that family dynamics are impacted by ICTs (Kaufmann and Widmer, 2006; Hannam et al, 2006; Lanigan et al, 2009; Beck and Beck-Gernsheim, 2012; Ayuso, 2019). This impact takes place as a consequence of the use of different hardware and software that mediate the relationships between family members. The main hypothesis of this study is that *the use of ICTs in family relationships acts as a facilitator of geographic mobility.* That is, in those cases in which ICTs have been incorporated into family relationships, the emotional cost of geographic mobility is reduced to the extent that these technologies make it possible to stay connected and provide support to those family members who are far away. However, this is not linear to the entire population, rather it is produced differently depending on sociodemographic and status factors, elements of competence and increased social capital in families. Thus, we have three sub-hypotheses:

(H_1) Hypothesis that ICTs promote geographic mobility: *Those individuals who use cell phones, WhatsApp and online social networks are more likely to be geographically mobile.*

ICT use is perceived in terms of utility (Davis, 1986, 1989), acting as a multiplier of geographical mobility in the process of adaptation by the individual actors to the network society from their particular lives and projects (Castells and Tubella, 2007), where communication is constructed and interpreted in a non-intersubjective way (Rettie, 2009) but with effects on the creation of community benefits (Pigg and Crank, 2004).

(H_2) The hypothesis of the acquisition of skills for the digital age: *When the members of a family become more competent and efficient through the use of ICTs, it is more likely that there will be geographic mobility of some of its members*.

ICTs offer a benefit that becomes evident in more coordinated and efficient families (Castells, 2006) who are more digitally competent due to the technological capital acquired (Selwyn, 2004) as mobile actors and who fit the principles of motility (Kaufmann, 2002; Kaufmann et al, 2004).

(H_3) The hypothesis of increased sociability in the global network society: *There is a greater probability of geographic mobility when the use of ICTs enables family members to have greater interaction with relatives who live far away and/or make new friends.*

That is, the global network society supports the expansion of the network of friends and family (Castells, 2001; Granovetter, 2003; Requena, 2008) in relational environments where connectivity in movement grows (Hannan et al, 2006).

(H_4) The hypothesis of mobility marked by the social digital divide: *The profile of Spaniards who say they move more because of the influence of ICTs varies according to age, educational level and socioeconomic status.*

Accordingly, the social implications of the use of ICTs are analyzed in relation to the digital divide (DiMaggio et al, 2001), focusing here on the structural and sociodemographic factor (Norris, 2001; Cabero, 2004) of social inequalities associated with the way in which a new technology is implemented and used (Robles and Molina, 2007; Torres et al., 2017).

3. Data, variables and methods

3.1. Data

The data used in this study were obtained from the Spanish Barometers 3057 and 3131 produced by the Spanish Center for Sociological Research (CIS)[c]. The CIS barometers are monthly surveys that have a fixed module focused on elements of social structure and a variable module dedicated to various issues of sociological interest. Specifically, this variable module in both study 3057 (March 2015) and study 3131 (March 2016) focuses on the impact of ICTs on the family. These Barometers are based on a random representative sample of the population living in Spain aged 18 years and over. The sample analyzed in this article is 4943 cases, for a confidence level of 95.5% (two sigmas) and a sampling error of ± 1.4%.

The type of sampling used in the Barometers is multistage, stratified by clusters, through the selection of primary sampling units (municipalities) and secondary sampling units (sections) in a proportional random manner. The final units (individuals) are selected following random routes and using quotas for sex and age. The Barometers developed by the CIS use proportional allocation, such that the sociodemographic characteristics of the surveyed population coincide with the official population data published by the INE.

Several of the survey questions included variables focusing on geographic mobility as a consequence of ICT use, variables associated with ICTs and their influence on family life, and sociodemographic and social status variables. These are the variables that we used to design the analyses undertaken in this study and that are presented in **Table 1**.

3.2. Dependent variable

The existence of geographic mobility as a consequence of the use of ICTs in family life was measured from question 19 of the Barometers. The question was worded as follows:

> *We would like you to tell us about ICT use (internet, mobile phone, etc.) in relation to your family life. Please tell us to what extent (quite a lot, a lot, a little or not at all) the use of these technologies has helped you to have greater geographic mobility.*

For inclusion in the binary logistic regression model applied, the categories of the original ordinal variable were recoded, resulting in a dichotomous variable: 1) *Yes, it allowed for greater geographic mobility* with a value of 1, which includes the original categories *quite*

[c] All the technical information from the surveys can be found on the Center for Sociological Research website. For study 3057 at http://www.cis.es/cis/opencm/ES/1_encuestas/estudios/ver.jsp?estudio=14168 and for study 3131 at http://www.cis.es/cis/opencm/ES/1_encuestas/estudios/ver.jsp?estudio=14272

a lot, a lot and a little (n=2,715); and 2) *It did not allow for greater geographic mobility*, which includes the original category *not at all*. (n=1.563).

[TABLE 1 NEAR HERE]

3.3. Independent variables

3.3.1. Use of ICTs in the last 6 months

Here we have three dichotomous variables that refer to the use or lack of use in the last 6 months of: 1) Mobile phone (calls and/or sms), 2) WhatsApp or another instant messaging application (Line, Telegram, Snapchat, etc.) and 3) Virtual social networks (Facebook, Twitter, LinkedIn, etc.). The three variables received the same statistical treatment taking not using them in the last 6 months as a reference category.

3.3.2. Control Variables

The control variables used are variables that serve to test part of our hypotheses: sociodemographic, socioeconomic status and variables of effects of ICT use in families.

The sociodemographic variables that we considered are: sex, age ranges and educational level. In order to include these variables in the models, they were used as dummy variables. In the sex variable, the reference category is *female*, in the age range variable the reference category is *65 years and over* and, finally, in educational level variable the reference category is *no studies*.

The socioeconomic status variable is a variable created ad hoc[d] by the CIS based on the examination of many other variables in the study (employment situation, class position of the population in terms of education and income, etc.). In our study, this was used as a dummy variable, with the reference category being *upper/upper-middle class*.

A final set of control variables included are associated with the consequences of ICT use on family members. Specifically, the three variables refer to whether family members: *become more efficient and competent, interact more with relatives who live far away, and, finally, make new friends*. These are dichotomous variables, where the reference category response was *no*.

3.4. Method

In order to test our hypotheses, as a methodological strategy we used binary logistic regression analysis, where geographic mobility is explained by the use of ICTs in relation to the family. In addition, the models presented included the control variables indicated above. This is an analysis technique appropriate to the subject of the study insofar as we can predict belonging to a group (mobile or not mobile, as a categorical dependent variable) from the set of independent variables.

4. Results

[d]Further information on how the CIS creates the Socioeconomic Status variable can be found in the document NOTA DE INVESTIGACIÓN at http://www.cis.es/cis/export/sites/default/-Archivos/NotasdeInvestigacion/NI010_CNO11-CNAE09_Informe.pdf

4.1. Factors influencing geographic mobility

Which factors explain geographic mobility related to the family when ICTs mediate? The explanatory capacity of the variables considered in this study associated with these mobility processes is presented in Table 2, which summarizes the results of the binary logistic regression analysis.

The first model, without considering the control variables, has an explanatory capacity of 19.1% (R-squared). The probability of having greater geographic mobility mediated by ICTs is almost 3.5 times greater among those who used Whatsapp and other instant messaging applications, and almost 2.5 times greater among those who used digital social networks. In addition, when both probabilities are combined - being a user of WhatsApp (and other applications) and being a social network user - the probability of having had greater spatial-geographic mobility rises to 8.6 times higher than those who have not moved. Nevertheless, mobile phone use alone does not increase or decrease the likelihood of greater geographic mobility. ICT-mediated spatial mobility is independent of mobile device use. That is, hardware (the device) is not useful for predicting the dependent variable, while software has a high predictive power (among the highest of all the variables included in the set of four models in our study).

[TABLE 2 NEAR HERE]

When sociodemographic control variables are included, the predictive capacity of the model improves to 22.6% (R-squared). Men are 1.3 times more likely than women to have greater geographic mobility as a result of the use of ICTs in their family relationships. By age ranges, compared to those aged over 65 years, the youngest (18 to 29 years) and those between 30 and 44 years, are 1.6 and 1.4 times more likely to have greater geographic mobility. The group aged 45 to 64 years does differ significantly from the reference category. Concerning educational level, it can be seen that, compared with those who have no studies (*no studies*), the probability of having greater mobility increases starting with those who have second stage secondary education, in this case the probability is 2.4 times greater. This positive probability is 2.1 times higher among those with vocational training and more than 2.7 times higher (as compared to those with no studies) among those with university education. As an example, a man under 29 years of age with a university education is 6.1 times more likely to have greater geographic mobility due to the use of ICTs in family relationships than a woman over 65 years of age with no studies.

Including the socioeconomic status variable, the predictive capacity improves slightly to 22.9% (R-squared). In this case, taking the upper/upper-middle class as the reference category, it is proven that the probability that they have undergone processes of spatial mobility due to the use of ICTs in the family decreases significantly only among qualified and unqualified workers. Indeed, among qualified workers, this probability is 38.2% lower than among those who are upper class/upper-middle class, while this same probability decreases by 41.4% among unqualified workers.

Finally, when we include all the control variables, adding those that measure the consequences that ICT use had on family members (Model IV), the explanatory capacity improves again (R-squared = 23.3%). It is shown that, among those who responded

affirmatively that their families became more efficient or competent, the probability that geographic mobility had increased is 1.5 times higher compared to those who had not seen this effect on their family members. The same probability occurs among those who said that as a result of ICTs they interacted more with relatives who live far away or made new friends. Taking into account the two variables associated with social capital, the probability of moving spatially is 2.2 times higher among those Spaniards who say that the use of ICTs has caused their family members to interact more with relatives who live far away and who have managed to make new friends.

5. Discussion and Conclusions

In this study, we did not measure the probability of geographic mobility per se. We have shown that the use of ICTs associated with family dynamics has a positive impact on geographic mobility. To do this, we worked with data that allowed us to measure the effect of variables concerning ICT use, sociodemographics, socioeconomic status and the effects of this use on families.

In view of our results, spatial-geographic mobility in Spain appears mediated by ICTs, if not facilitated by their use in family relationships. This allows Spaniards to develop their own networks based on their own lives and life projects (Castells & Tubella, 2007) through the networking generated by the usefulness and acceptance of the use of technologies (Torres et al., 2017) such as Whatsapp and online social networks, but without the specific weight of the physical device used for communication. Thus, the hypothesis that ICTs promote geographic mobility was confirmed only in part, to the extent spatial mobility seems to be explained by the use of software, but not by the use of hardware (mobile phones). Moreover, if family relationships are mediated by messaging applications and virtual social networks, we are witnessing communication constructed and interpreted individually and not intersubjectively (Rettie, 2009), but with positive consequences for the generation of social - relational capital.

Accordingly, the *hypothesis of the acquisition of skills for the digital age* was also supported. Thus, it is more likely that there will be more ICT-mediated spatial mobility among those Spaniards whose families are more efficient and competent than among those who are not. Spatial-geographic mobility implies a displacement in space, but beyond this, those Spanish families who are more efficient, coordinate better (Castells, 2006), and improve their competence (digital, why not), describe movements beyond the geographical as an element of the very dynamics of the social structure (Kaufmann et al, 2004). Spanish families show attributes that are specific to mobility (Kaufmann, 2002): accessibility to these technologies, capacity and competence in the knowledge required to move in today's society (penetration of the use of applications and social networks) and recognition of their own mobile capacity (appropriation) using elements that support this mobility. In other words, those Spanish families that have the attributes of mobile players will describe spatial mobility processes to a greater extent.

More competent, more efficient Spanish families are families that exhibit the dimensions that have an impact on motility (Kaufmann & Wimder, 2006): autonomy - fusion, openness and a specific type of regulation. In other words, if there are families in Spain that, as a result of technologies, are made up of more competent and efficient members, and with these traits the probability of moving spatially increases, this may indicate that: 1) they are families whose members share the idea of using technological resources jointly

and for the benefit of the family itself (they coordinate more closely in the context of the technological revolution); 2) they are families open to the external world and impacted by the transformations of the information society where mobile lifestyles develop (Elliot & Urry, 2010) and, 3) finally, in Spain, the category of family may be emerging where family regulation (the way in which they coordinate) is based on more open communication and greater flexibility in managing daily life (Kaufmann & Wimder, 2006). In this way, families in Spain would have the capacity to organize, coordinate and adapt to the new society with the aim of social advancement (Parsons & Bales, 1955; Castells, 2006), while also having the capacity to acquire mobile capital (Kaufmann & Wimder, 2006).

The hypothesis *of increased sociability in the global network society* has also been confirmed. Thus, if a person's family has expanded their relationships (both family and friends) by using ICTs, it is more likely that this person has also described processes of geographic mobility. In other words, geographic mobility does not imply isolation, but rather can increase the social capital of individuals if this mobility has been positively influenced by ICTs. The rise in social interactions that are not face-to-face is allowing new contexts to develop in Spain - both real and virtual sociability spaces on the basis of technological development. All this is fostering increased interpersonal family contact, complementing other forms of communication such as those produced face-to-face (Wellman et al., 2001) by simulating these directly (Rettie, 2009) through ICTs. Spanish families therefore form part of the greater process of creating a society, where spaces are blurred (they are not as delimited) and everything is articulated in a reticular and effective network of relationships (Requena, 2008), with special emphasis on the mobility processes of those families with increasingly global lifestyles (Elliot & Urry, 2010).

The community benefits of this network society (Pigg & Crank, 2004) seem clear. The possibility of leading a family life at a distance or of connecting with people who are far away increases (Hannam et al., 2006), thus strengthening both strong and weak ties (Granovetter, 1973). This growth, which is taking place in Spain, confirms the idea that the online and offline worlds are linked as a result of digital social networks (Serrano, 2013), and also strengthen face-to-face social relationships (Granovetter, 1973). Using approaches from Castells (2001), this study demonstrates that the sociability that is promoted as a consequence of Internet use increases contacts, not only in local society (in the closest surroundings) but also in global society (in the contexts of mobile life), where Spanish families have adopted and incorporated into their daily lives the idea of virtual travel (Urry. 2002) in their mobile lives. The arrival of this virtual journey is a response to preserving necessary emotional bonds needed by the Spanish family (Lanigan et al., 2009).

In this study, and as a result of the *hypothesis of mobility marked by the social digital divide*, it became clear that certain sociodemographic and socioeconomic status variables explain the greater probability of geographic mobility in Spain, as stated by Módenes and López (2004) and Bentolila (2001). Specifically, the opportunity for geographic mobility mediated by technology varies among Spaniards depending on structural variables, with differences according to sex, age, educational level (three personal attribute variables) and socioeconomic status (social stratification variable). These differences by age and educational level revealed in our analysis of proxy variables agree with the abovementioned data from the Statistics on Labor and Geographic Mobility in Spain (INE, 2020), which measures actual movements in terms of change of residence.

The differentiated penetration of the Internet according to age and educational level in Spain[e] suggests that these two structural variables are central in explaining the possible limitations that may be occurring in the use of ICTs, the frequency with which they are used and how advanced their use is (Torres et al., 2017). Thus, the digital divide in access to new technologies, defined by the limitations and difficulties of access to the Internet or to technological infrastructures (Serrano and Martínez, 2003), is influenced by social factors (social digital divide), factors underlying the existing social stratification in Spanish society such as sex, educational level (Norris, 2001) and age (Cabero, 2004), which in addition, explains differences regarding the significant presence of these three variables in explanatory models of ICT-mediated spatial mobility. The presence of structural variables to explain mobility can be found in Huber (2004) in his analysis of inter-regional mobility in Europe, in Borghans and Golsteyn (2012) in their comparison of labor mobility in Europe, Japan and the United States or in Viry and Kaufmann (2015) in their study of mobility in Europe and its implications for the family and professional development.

Similarly, the probability of geographic mobility in Spain, which has been driven by the use of ICTs, differs according to social class. The dynamics of spatial mobility that transform social structures and allude to a form of distribution of individuals, families and groups within the structures or networks themselves (Kaufmann et al., 2004) does not affect all layers of the Spanish social structure equally, and here the concept of the mobile-digital social class divide takes on meaning.

Several limitations should nonetheless be mentioned. Possible reverse causality is one of these. That is, in this study we demonstrated causality: those individuals who use ICTs (software, specifically) in family relationships are more likely to move geographically. It is possible to imagine that the opposite occurs: those individuals who have moved geographically are more likely to use ICTs within their family. In this case, given the meaning of the question included in the questionnaire used for this study, we consider that this reverse causality is not measured. Therefore, we cannot refer to it in this study, as the respondent is specifically asked to indicate whether the use of these ICTs has been beneficial for geographical mobility. Similarly, it is clear that having longitudinal data (not available) as opposed to transversal data (as is the case here) would allow for a better analysis of the possible causality of the phenomenon and a deeper insight into the real experiences of individuals who have undertaken a geographical move. Finally, it should be pointed out that, given the scope of analysis (Spain), we have no information regarding the opinions and attitudes of those Spanish citizens who have emigrated abroad and who did not form part of the population studied.

The field of research in this area remains very broad, both in terms of the impact of ICTs on society in general and on family dynamics. Future studies should address whether the processes of spatial mobility run parallel to the increase in social capital or, conversely, whether this process of mobility has led to the obligatory increase in the use of technological means to facilitate the expansion of social and personal networks, without

[e] According to data from the National Statistics Institute (Spain) *Survey on Equipment and Use of Information and Communication Technologies in Households* (2018). These data can be accessed at: https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=Estadistica_C&cid=1254736176741&menu=resultados&idp=1254735976608

falling, of course, into technological determinism. We also consider it of crucial interest to further explore the emergence of the social digital divide and, in particular, the dynamics associated, not as much with access or difficulty of access as with the new forms of inequality that this divide may ultimately cause with regard to class structure. It would also be of great interest to conduct a study in which data from directly measured geographic mobility processes are combined and compared with indirectly measured mobility processes (with proxy variables) as a way of complementing the shortcomings of these data if they are treated individually. Finally, further studies should be undertaken in spatial-geographical mobility using new methodological strategies to understand the different discourses surrounding the role that ICTs play in the mobility processes of Spanish families and their members.

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Table 1. Descriptive statistics for the variables in the regression models.

	N	Mín.	Máx.	Mean	SD
Independent variables					
Has used in the past 6 months					
Mobile phone (calls and/or sms)	4937	0.00	1.00	0.9247	0.26398
WhatsApp or other application (Line. Telegram. Snapchat. etc.)	4943	0.00	1.00	0.7087	0.45442
Virtual social networks (Facebook. Twitter. LinkedIn. etc.)	4943	0.00	1.00	0.4762	0.49949
Control variables					
Sociodemographic					
Male (dummy)	4943	0.00	1.00	0.4900	0.50000
Age ranges (dummy)					
18 to 29 years	4943	0.00	1.00	0.1562	0.36306
30 to 44 years	4943	0.00	1.00	0.2899	0.45376
45 to 64 years	4943	0.00	1.00	0.3292	0.46995
65 years and older	4943	0.00	1.00	0.2248	0.41747
Educational level (dummy)					
No studies	4932	0.00	1.00	0.0570	0.23182
Primary	4932	0.00	1.00	0.1782	0.38274
Secondary 1st Stage	4932	0.00	1.00	0.2476	0.43164
Secondary 2nd Stage	4932	0.00	1.00	0.1306	0.33697
Vocational Training	4932	0.00	1.00	0.1825	0.38628
University	4932	0.00	1.00	0.2042	0.40314
Socioeconomic Status (dummy)					
Upper class/upper-middle class	4943	0.00	1.00	0.1794	0.38376
New middle classes	4943	0.00	1.00	0.2306	0.42128
Old middle classes	4943	0.00	1.00	0.1343	0.34104
Qualified workers	4943	0.00	1.00	0.2923	0.45488
Unqualified workers	4943	0.00	1.00	0.1404	0.34744
Consequences of ICT use in families					
Become more efficient and competent	4263	0.00	1.00	0.4091	0.49173
Interact more with family members who live far away	4547	0.00	1.00	0.6941	0.46084
Make new friends	4307	0.00	1.00	0.5368	0.49870
Dependent variable					
Have greater geographic mobility due to the use of ICTs	4278	0.00	1.00	0.6346	0.48159

Source: CIS, Barometers 3057 (March 2015) and 3131 (March 2016). Author's own elaboration.

Table 2. Analysis of binary logistic regression of Spaniards who consider that they do have greater geographic mobility due to the use of ICTs.

Independent variables	Model I		Model II		Model III		Model IV	
	Odds ratio		Odds ratio		Odds ratio		Odds ratio	
Usage variables								
Mobile use	.898		1.061		.976		1.104	
Use of Whatsapp and other applications	3.466	***	2.468	***	2.434	***	2.260	***
Use of virtual social networks	2.470	***	2.009	***	1.981	***	1.766	***
Sociodemographic variables								
Sex								
Male			1.343	***	1.366	***	1.383	***
Female (ref.)			---		---		---	
Age								
18 to 29 years			1.674	***	1.760	***	1.861	***
30 to 44 years			1.431	**	1.537	**	1.706	***
45 to 64 years			1.156		1.213		1.230	
65 years and older (ref.)			---		---		---	
Educational level								
No studies (ref.)			---		---		---	
Primary			1.092		1.023		.758	
Secondary 1st Stage			1.374		1.281		.853	
Secondary 2nd Stage			2.368	***	1.981	**	1.352	
Vocational Training			2.096	**	1.822	**	1.243	
University			2.723	***	1.901	**	1.494	
Socioeconomic status variables								
Upper class/upper-middle class (ref.)					---		---	
New middle classes					.806		.795	
Old middle classes					.793		.782	
Qualified workers					.618	***	.593	***
Unqualified workers					.586	***	.581	***
Consequences of ICT use in families variables								
Become more efficient and competent							1.485	***
Interact more with family members who live far away							1.509	***
Make new friends							1.467	***
Constant	0.476	*	0.221	***	0.365	*	0.262	**
-2 log-likelihood	4973.8 85		4835.1 37		4710.6 54		3882.4 76	
Chi squared	0.000		0.000		0.001		0.000	
Nagelkerke's R-squared	.191		.226		.229		.233	
Overall percentage of classification	71.8		72.3		72.2		72.5	
N	4277		4269		4169		3510	

Source: CIS, Barometers 3057 (March 2015) and 3131 (March 2016). Author's own elaboration.

Level of significance: *** p < 0.001, ** p < 0.01, * p < 0.1