

THE ORDINARY MOBILE TELEPHONE AS AN ENHANCING FACTOR FOR SENIOR CITIZENS' MOBILITY.

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This work contains part of the results of project SIZE – *"Life quality of senior citizens in relation to mobility conditions"* (project number QLK6-CT-2002-02399) which is a project in the framework of the specific research and technological development programme "Quality of life and management of living resources", key action 6 "The ageing population and disabilities" in EU's Fifth Framework Programme.

ABSTRACT

Nowadays it cannot be denied that the use of cellular or mobile phones has become a social phenomenon widely disseminated due to its extraordinary versatility.

Currently some voices are asking for a bigger exploitation of this device in order to substitute the increasing number of cards (carnets, travel-bonus, cash,...), cancelling and expenditure machines/sites. Also, from our experience in developing the research EU-Project "SIZE", we found that the ordinary mobile phone has proved to be a determinant element to enhance the mobility of older adult citizens.

Some projects are now being carried out in Spain using mobile phone technology but when talking about new technologies there is always the question of how senior citizens will cope with them. In this communication we would like to present a small study exploring the importance that senior citizens have given to this device related with their autonomy-independence and as one of the solutions for increasing their mobility.

We also have the intention of studying what are the optimal characteristics that a mobile phone should have, including the type of company tariff so that it is specifically designed for senior citizens; in order to present some recommendations with direct implications for the industry.

KEY WORDS: Senior citizens, elderly, mobility, transport safety, mobile phone, wireless technologies, telematics

1. Objectives

The general objective of this paper is to put forward the relevance of the mobile telephone as an enhancing element for the mobility of the senior citizens in the EU, and more specifically:

- To determine whether there are differences between the degree of usefulness (in terms of its urgency as a solution) attributed by senior citizens and the so called "expert group", and also among the countries taking part in the SIZE project, in regard to the mobile telephone as a facilitating element for the mobility of senior citizens.
- To determine the relative contribution of *having a mobile phone with them* to the senior citizen's feeling of autonomy in the relative context of the variables considered in the SIZE questionnaire.

2.- Justification

2.1.- The success of the mobile telephone

A common scene in urban areas is that of a mass of people with their heads slanted to one side and their mobiles attached to their ears.

The mobile telephone has brought about a revolution. Its advantages have made it necessary in this globalized society. The mobile telephone allows freedom of movement to the user and is the maximum expression of individual freedom and confidentiality in the telecommunication field.

2.2.- Users

In the 25 countries of the EU, the number of mobile phone owners (subscriptions) was around 80 per 100 of their inhabitants in 2003 (*Eurostat* 2004; 2005), for some members states, the penetration rate for mobile communications was close to 90% (communication from Commission of 19 November, 2003).

However the mobile phone industry seems to have lost sight of other significant changes of our time, the ageing population. The industry seems to be completely focused towards the young sector of the market, losing out on an enormous opportunity to attend to the needs of and win over senior citizens. The market for senior users of mobile telephones remains widely unexploited and potentially lucrative enough, but perhaps society (including senior citizens themselves) has not made its mind up over the utility of mobiles for senior citizens and is not too clear whether the industry is prepared to accept this challenge.

But technology can enhance the daily lives of senior citizens by providing opportunities to maintain or increase their independence. The rapid growth of technology and the increase in the age of the population are happening at the same time. As more people who regularly use computers as part of their working lives (and therefore tend to have a higher comfort level with them) continue to enter into the category of "senior citizen", the percentage of older users of this type of modern technology will continue to grow. In fact senior citizens are already the fastest growing customer group in computer sales and Internet services.

Some reports (*Empocket*, 2004) show that, contrary to popular belief, mobile phone penetration is still growing. The elderly demographics are leading this growth. Penetration in the 65+ age group has grown at a rate of 42% each year. In Europe, the prospective for 2010 for those aged 65 or more who will use wireless services will range from 30% to 50%. This is however a best-case scenario (Forge, Blackman and Bohlin, 2005). In Spain 32% of adults over 65 are mobile users; still some way from the 70% that characterizes the general population (Miranda, 2004).

2.3.- Applications

The mobile phone can be a tool for work and a personal communication device, but it can also be considered as virtually a small personal assistant with an antenna. According to Perez (1996) 13% of users have had to call at least once to ask for help in situations of personal emergency from their mobile telephone.

Among the new uses, different from those of simply verbal communication, it must be emphasized the short messages (SMS) and the so called MMS technology that allows the user to send not only text but also images.

Some social and medical sectors have studied the great possibilities that the mobile telephone offers in diverse medical applications: for example in the fields of Alzheimer's disease, Asthma and Hypertension.

Some applications directly related to the transport are:

To know traffic conditions in real time:

Thus, it is possible to know where the traffic is congested or an accident has happened, with the exact indication of the initial and final kilometre of the bottleneck, its possible causes and even the scope of the damage and other information.

Finding the best route by public transport or the location of the shop or service desired:

One of the new possibilities made available by WAP is the novel system of location based on the position of the user. This technology allows for the automatic location of the position of the mobile, and offers information about the closest amenity desired. When the user enters this menu and requests information about restaurants, drugstores, traffic, cashiers or any other service, the net operator verifies where the interested party is and how to get to their desired destination.

Getting tourism information and reservations:

Information about rural houses, resorts, hotels, the cost of plane tickets and tourist packages, which can be obtained by mobile phone.

Also, the mobile telephone can play a more active role in the traffic-system, like:

Communicate a road accident and ask for help:

The mobile telephone users can easily and rapidly inform the event of an accident or incident on the road to the road authority and ask for assistance or help.

Public transport payment:

Following the *European Committee for Standardization* (2003) mobile communication networks are one of the telematic systems or technologies applicable to multimodal and interoperable transport, to which standardisation activity is or should be addressed.

The use of the mobile telephone as a means of payment is a good candidate for the title of "killer application". The potential development of the *Internet electronic trade*, added to the insecurity that the consumer perceives in the use of "*plastic money*", have prompted the appearance of initiatives aimed at the generalization of the use of the mobile telephone as a payment tool (Perez, 2002). The utilization of these types of terminals is progressively gaining ground, because of the distrust of inserting a secret credit card number to acquire products over the net.

The experts (Grado and Grado, 2005; McManus and Standing, 2004) think that this system of acquisition supposes a "minimal" cost in comparison with other means of payment, and at the same time diminishes the level of identification needed. It also allows for the use of "micro-payments" (less than 10 Euros).

Among the advantages of this new means of payment is the fact that the user is "authenticated" in a secure way "without risk of supplantings". Likewise, it can be a good alternative form of payment for businesses in which mobility is a "decisive" factor, such as taxi companies or public transport.

In the chapter on the disadvantages appears the fact that the payments made on these types of terminals " has not yet reached the awaited penetration ", according to the experts, there still remains some problems to be solved such as the safety of the transmission and the legal protection of the consumer, as well as its acceptance as a "trustworthy" mean of payment.

At the present, a pilot project is underway in Malaga (Spain) (Ruiz, 2004), whereby bus tickets can be bought by mobile phone. In the project the *Malaga Transport Municipal Enterprise (EMT)*, the *BBVA* bank, *Telefónica* co. and *Mobipay España* are all involved and they will allow users to recharge their cards and to acquire tickets by means of *Mobipay*. The system consists basically in the user identifying his/her card transport number using *Mobipay*, the user also indicates the type of recharges wanted (either ten trips or a flat monthly tariff) and the user confirms the purchase by passing the card in front of a recharge post. In the case of a single ticket a SMS will be received by the user showing a bar-code on the screen of their mobile phone which has to be passed in front of a bar code reader on the bus and this will check off the ticket by GPRS, coordinated by a centralized system of ticket management developed by *Telefónica*.

In France, The *France Télécom Company* and the society of highway travellers' transport *Transdev* have initiated an ambitious project that will allow for the buying of bus tickets on inter-city routes by mobile telephone.

The advantages of this technology aim to be, "comfort for the client who can request the ticket right up to the last moment and save queuing at stations".

Apparently, in Finland it is already possible to pay for many public transport services by mobile phone.

Parking fee payment in blue zones:

Based in the same advantages and procedures see above, pilot experiences in this direction are carrying in several cities, like Cork (Ireland). The car owners can use their mobile phone to pay their parking fee in blue zones and to record their payment done.

2.4.- Importance of the mobile phone to facilitate the mobility of senior citizens

We will find an increasing number of studies interested in how senior citizens can benefit from such new technologies, for example:

EU project LOCOMOTION (IST. 2001-32180) is devoted to the investigation, development, and testing of an innovative location service for the Elderly and disabled citizens.

Some market studies deal specifically with senior citizen IST needs (*information society technologies*) to guide the industry, RTD projects and policies. In these studies older Europeans appear to regard the mobile as a security device (*SeniorWatch*, 2002).

Senior Citizens' Organizations themselves have started to show real interest in ongoing activities, innovative projects and practical examples of specific mobile applications to their needs of independence and mobility (*Bundesarbeitsgemeinschaft Der Senioren-Organisationen*, 2005). In general the relevance of new technology for senior citizens has been pointed out by Fubini (2002), Mollenkopf & Kaspar (2002) and Marcellini, Marcucci & Freddi (2002) among others.

The EU Commission opened a recent public consultation on the New Information Society Strategy for beyond 2005 (*EU Commission*, 26 November 2004 – 17 January 2005). The rapidly ageing population has been considered a challenge to take into account. By 2020, around 40 % of the population will be older than 65. Health and increased mobility will play an important role in society, not only because of the ageing population but also because the borders of the European Union are expanding.

Finally, it is worth mentioning the *OECD-MIT International Symposium* celebrated in Cambridge, Massachusetts in September 2003, devoted to *New Transport Technologies for Older People* in which different mobile applications were presented.

From our experience in the project SIZE (*Life Quality of Senior Citizens in Relation to Mobility Conditions*), we have had the opportunity to know the opinion of those really affected and involved (both senior citizens, and experts/decision makers).

3.- Procedure

3.1.- Sample.

Two kinds of samples from 8 European countries took part in this study:

a) A group of "experts" belonging to three different competences: political, technical and advisory; all of them involved in the fields of transport and mobility in each participant country.

b) A larger group of senior citizens aged 65 or more from the same participant countries as the "experts".

An *expert sample method* was followed for gathering the 'experts' and the decision-makers sample and a proportional *quota sample method* for gathering the 'senior-citizen' sample, following the criteria of living area, age group and gender.

Their distribution and number was as follows:

"EXPERTS" SAMPLE DISTRIBUTION	
COUNTRY	N of CASES
Austria	63
Germany	62
Ireland	45
Italy	65
Sweden	61
Poland	60
Czech Rep.	61
Spain	73
TOTAL	490

"SENIOR-CITIZENS" SAMPLE DISTRIBUTION	
COUNTRY	N of CASES
Austria	414
Germany	413
Ireland	413
Italy	414
Sweden	414
Poland	414
Czech Rep.	414
Spain	413
TOTAL	3309

3.2.- Instruments

3.2.1.- Questionnaires for gathering information.

The relevant data for this study comes from two questionnaires developed in the SIZE project. These questionnaires were developed following a method to convert previous qualitative information into quantitative (Monterde-Bort & Moreno, 2004).

According to common specific guidelines, the transcription of the answers of affected people (senior citizens and experts) obtained from interviews during the qualitative phase of the

SIZE project was organized to report what was said separately for each of five questions asked in the interviews (see Zakowska & Monterde-Bort, 2003):

- 1) HOW DO senior citizens COPE with the present mobility situation?
- 2) WHAT ENHANCES the mobility of senior citizens?
- 3) WHAT LIMITS the mobility of senior citizens?
- 4) WHAT MEASURES ARE NECESSARY to improve the situation?
- 5) WHAT PREVENTS MEASURES that are considered useful from being implemented?.

After a categorisation of all the responses given by the interview participants ("seniors" and "experts" separately), a large list of statements was produced and submitted to a selective and refining process. The result was 73 basic statements (common to the 8 countries) over which were elaborated the questionnaire items, classified into 4 logical factors: **fears** -older adult psychological barriers- (9 items), **life-quality indicators related with older-adult mobility** (17 items), **barriers to older-adult mobility** (18 items) and **solutions for older-adult mobility** (19 items).

The circumstance of having an ordinary mobile telephone with them (senior citizens) was one of the "solutions" items.

Besides these logical factors originally composed of statements made by the affected people, 4 items were added which represent attitudes towards **balanced political decisions** (decisions which would have positive consequences but also certain negative consequences) and a further 11 criteria variables were included: **Living area** (5 levels from urban to rural), **Age, pension amount or income** (adjusted relatively for each country), **condition of belonging to some elderly association**, **condition of needing regularly some kind of help to move around (and what)**, plus an **index of "satisfaction with their life - senior citizens-"** (0 to 5 points), developed ad-hoc by us from the *Diener's Satisfaction With Life Scale* (Diener et al, 1985), and an **index of "autonomy/independence"** (0 to 9 points), also developed ad-hoc by us from the *Lawton-Brody Instrumental Activities of Daily Living* (Lawton and Brody, 1969).

3.2.2.- Data processing.

For the analysis of the information obtained through the described questionnaire, we used the statistical package SPSS version 12 and the Microsoft EXCEL spreadsheet.

4.- Results

4.1.- The mobile (ordinary) telephone viewed as an urgent solution for enhancing the mobility of senior citizens

In our study, senior citizens were asked their opinions about to what extent they consider as an urgent solution for enhancing their mobility having an ordinary mobile telephone with them. They were asked to grade the urgency with which this solution should be applied as: "not urgent" (value=0), "somewhat urgent" (=1), "quite urgent"(=2) and "very urgent" (=3).

The results, in percentages, are shown in the follow table, for each studied country and for the total.

Table 1: How urgent senior citizens considered the solution of carrying an ordinary cellular telephone for their mobility to be.

COUNTRY	Not urgent (0)	Somewhat urgent (1)	Quite urgent (2)	Very urgent (3)	Quite + Very (2)+(3)
Austria	19.1 %	16.8 %	33.9 %	30.2 %	64.1 %
Germany	39.1 %	25.3 %	23.8 %	11.8 %	35.6 %
Ireland	7.8 %	18.7 %	26.1 %	47.3 %	73.4 %
Italy	23.9 %	20.0 %	39.0 %	17.1 %	56.1 %
Sweden	17.1 %	18.3 %	37.2 %	27.4 %	64.6 %
Poland	37.8 %	26.1 %	24.9 %	11.2 %	36.1 %
Czech Rep.	16.5 %	28.1 %	32.7 %	22.8 %	55.5 %
Spain	36.3 %	19.0 %	25.8 %	19.0 %	44.8 %
TOTAL	24.7 %	21.6 %	<u>30.4 %</u>	23.2 %	53.6 %

The last column offers the results adding the two response categories “very urgent” and “quite urgent”, the “somewhat urgent” category has been considered by us as a neutral position. So, the results made it clear enough that the majority of senior citizens consider as an urgent measure having an ordinary mobile telephone with them to increase their mobility: 53.6% (quite or very urgent) versus 24.7% (not urgent) over the total sample, being the “quite urgent” category the most selected.

Also, the group of “experts” was asked about the same characteristic with reference to senior citizens (“in your opinion -expert’s opinion- how urgently do you think the circumstance of senior citizens having the possibility of carrying an ordinary mobile telephone should be implemented to increase their mobility”). The global results (with the whole sample of the experts) are shown in the following table.

Table 2: How urgent the EXPERTS consider the solution of senior citizens carrying an ordinary cellular telephone to be for their mobility.

	Not urgent (0)	Somewhat urgent (1)	Quite urgent (2)	Very urgent (3)	Quite + Very (2)+(3)
Expert’s total sample	21.4 %	<u>41.7 %</u>	23.4 %	13.5 %	36.9 %

In this case, the “experts” impute less importance to mobile telephones than senior citizens as a mobility enhancing factor for senior citizens. The category most selected by the “experts” was the neutral (“somewhat urgent”).

In addition to the above question, the “experts” were asked about the type of cause which prevents this measure from being implemented, among 7 possible types of hindrances used in our study (Monterde-Bort & Moreno, 2004), based in the Banister’s classification (Banister, 2002). These results are shown in the following table.

Table 3: Expert's opinion about what is the main barrier type for implementing the availability of ordinary mobile telephones among the older adult population.

Type of Barrier	%
1) Coordination problems among Administration competences (conflicts among different Government-Administration levels)	3.8
2) Legal problems (difficulty to fit into legal requirements)	6.3
3) Exclusively financial problems	55.1
4) Negative side effects over other activities (transport, tourism, national industry,...)	3.1
5) Opposition of other collectives (ecologists, handicapped, trade-unions,...)	5.4
6) Cultural barriers (social refuse, religion,...)	23.1
7) Physical-Topographical barriers	3.1

It is difficult to interpret these results according to the characteristics of some types of barriers, so, perhaps it is necessary to study more the circumstances that the experts take into consideration when they answer this question. In any case, the type of implementation barrier selected most by the "experts" was "financial problems" (55.1 %) followed by "cultural barriers" (23.1 %).

Finally, inside this analysed topic, a test of statistical significance was done for comparing the groups, senior citizens and "experts", in the urgency degree assigned to this telematic solution.

As a result of the current controversy about significance tests (Wilkinson & The APA Task Force on Statistical Inference, 1999; *APA Publication Manual* -5th ed.-, 2001), and the particular characteristics of the compared samples (big N's difference and ordinal type variable), we used non-parametric statistics, concretely the *Mann-Whitney U Test*, and offer additionally the (pseudo)Means and its 95% confidence interval limits. The following table shows the comparison results.

Table 4: Statistical significant differences between older-adults and "experts" in the urgency level given to the availability of ordinary cellular telephone by the senior citizens as a solution for enhancing their mobility.

Compared Group	N (valid cases)	Mean	95% confidence interval around the Mean	Mean Rank	U value	Signif. (2-tailed)
Older-adults	3242	1.52	1.48___1.56	1892.33	684604.0	p<.001
Experts	482	1.29	1.21___1.37	1661.84		

The result is statistically and socially significant in favour of older-adults group. This population group gives a higher degree of urgency to this mobility solution (having an ordinary mobile telephone with them) than the experts, who consider this solution as less urgent.

4.2.- The importance of the ordinary mobile telephone in defining the "autonomy/independence" of senior citizens

A specific measure of autonomy/independence was developed in order to be used as an external criterion. The development of this index was based on a consolidated instrument, the *Lawton-Brody Instrumental Activities of Daily Living* (Lawton & Brody, 1969) used with senior citizens in clinical medical and psychological settings. In order to have a quick and easy measure, over this scale we built a brief adapted version of it using four cumulative levels (0 to 3) for each one of three domains: "doing the shopping", "using transport modes" and "handling finances". The result consisted in a scoring system with a range from "0" (minimal autonomy/independence) to "9" (maximal autonomy/independence) points.

One of the objectives planned in the SIZE project was to define this construct from the different research variables studied. This operatively can consist in finding which set of variables, among all studied, is enough to predict the autonomy-independence of senior citizens. So we launched a Discriminant Analysis using all of the variables as predictors, and this autonomy/independence index as the criterion (dividing the older-adults sample in two group-levels: "low autonomy group" and "high autonomy group").

The in depth analysis of these results exceeds the objectives of this paper, we only wish to highlight, as concerns our current interest here the following. Firstly that to consider as an urgent mobility solution that senior citizens should have with them an ordinary mobile telephone was one of the discriminant variables selected among 73 predictor variables introduced. Secondly that this variable occupied 10th place (of 12) in importance for the autonomy prediction of those older-adults who drive and 15th place (of 23) for the autonomy prediction of senior citizens in general.

The summarized tables of both discriminant analysis (driver and general senior-citizen samples) are as follows.

Table 5: Discriminant Analysis in function of the condition of having low or high independence/autonomy. Partial sample: SENIOR CITIZENS WHO DRIVE.									
CANONICAL DISCRIMINANT FUNCTION									
Functio	Eigenvalu	Pct of Var	Cum Pct	Canonical Corr	Wilks' Lambda	Chisquare	df	sign	
n	e	100.0	100.0		.742	197.475	12	<.001	
1	.348			.508					
CENTROIDS (GROUP MEANS)							Function 1		
Low autonomy/independence group =							1.949		
High autonomy/independence group =							-0.178		
CLASSIFICATION RESULTS					Predicted group membership				
N	Real (original) group				As Low	As High			
81	Seniors with LOW autonomy/independence				54 66.7 %	27 33.3 %			
88 3	Seniors with HIGH autonomy/independence				123 13.9 %	760 86.1 %			
Percent of originally grouped cases correctly classified/discriminated = 84.4 %									
STRUCTURE COEFFICIENTS (correlations variable-function) ordered from the most to the least important.									
<i>Note: 1)Only from the selected variables.2)Positive coefficients go in favour of "low" autonomy, negatives "high".</i>									
Variable	Function 1	Description							
fear-11.9	.572	<i>To sense that his/her reflexes are not what they were. [as drivers]</i>							
bar-13.18	.493	<i>To consider as barrier (for their mobility) to find an uncomfortable design of vehicles (too old and out of fashion car). [as drivers]</i>							
fear-11.4	.428	<i>To feel fear of becoming completely confused (for example, fear of being lost and not recognising people in the streets).</i>							
mov_help	.417	<i>To use regularly some kind of help to moving.</i>							
fear-11.8	.379	<i>To sense that his/her does not like to drive as much anymore. [as driver]</i>							
bar-13.14	.348	<i>To consider as barrier (for their mobility) the reliance on people around he/her (family, neighbours, volunteers, other passengers).</i>							
pension	-.327	<i>Pension amount / Income.</i>							
qli-12.03	-.231	<i>To consider as a life-quality indicator (for their mobility) the ease to afford the regular needs for mobility, e.g. petrol for the car, taxi,... (no financial problems).</i>							
qli-12.04	.209	<i>To consider as a life-quality indicator (for their mobility) the ease to find company / companions for going out and about (some one to walk with and to talk to).</i>							
sol-14.19	-.175	<i>To consider as urgent solution (for enhancing their mobility) to wear (to carry with him/her) a cellular/mobile (ordinary) telephone.</i>							
qli-12.06	.153	<i>To consider as a life-quality indicator (for their mobility) the ease to access resting places and seating areas in public places.</i>							
sol-14.18	-.063	<i>To consider as urgent solution (for enhancing their mobility) to nominate a "Senior Citizens' Representative (or Campaigner)" to each level of Administration (municipal, councils, ..., EU government).</i>							

Table 6: Discriminant Analysis in function of the condition of having low or high independence/autonomy. General sample: SENIOR CITIZENS.

CANONICAL DISCRIMINANT FUNCTION								
<u>Funcio</u>	<u>Eigenvalu</u>	<u>Pct of</u>	<u>Cum Pct</u>	<u>Canonical</u>	<u>Wilks'Lambda</u>	<u>Chisquare</u>	<u>df</u>	<u>sign</u>
<u>n</u>	<u>e</u>	<u>Var</u>	100.0	<u>Corr</u>	.538	847.337	23	<.001
1	.860	100.0		.680				
CENTROIDS (GROUP MEANS)							<u>Function 1</u>	
Low autonomy/independence group =							1.106	
High autonomy/independence group =							-0.777	
CLASSIFICATION RESULTS					Predicted group membership			
<u>N</u>	<u>Real (original) group</u>				<u>As Low</u>	<u>As High</u>		
75	Seniors with LOW autonomy/independence				599	154		
3					79.5 %	20.5 %		
99	Seniors with HIGH autonomy/independence				147	847		
4					14.8 %	85.2 %		
Percent of originally grouped cases correctly classified/discriminated = 82.8 %								

Table 6 (cont.): Discriminant Analysis in function of the condition of having low or high independence/autonomy. General sample: SENIOR CITIZENS.

STRUCTURE COEFFICIENTS (correlations variable-function) ordered from the most to the least important.		
<i>Note: 1)Only from the selected variables.2)Positive coefficients go in favour of "low" autonomy, negatives "high".</i>		
<u>Variable</u>	<u>Function 1</u>	<u>Description</u>
bar-13.12	.592	<i>To consider as barrier (for their mobility) the awkwardness, bad balance, a feeling of insecurity when walking.</i>
fear-11.3	.491	<i>To feel fear of falling down / being injured.</i>
mov_help	.490	<i>To use regularly some kind of help to moving.</i>
pension	-.413	<i>Pension amount / Income.</i>
bar-13.03	.411	<i>To consider as barrier (for their mobility) the ramps (for wheelchairs or for access to garages) on footpaths (e.g. may cause loss of balance).</i>
sol-14.04	.403	<i>To consider as urgent solution (for enhancing their mobility) to have specific legislation related to older adults.</i>
fear-11.4	.368	<i>To feel fear of becoming completely confused (for example, fear of being lost and not recognising people in the streets).</i>
bar-13.02	.395	<i>To consider as barrier (for their mobility) the roundabouts in urban areas (which make it difficult for walking/crossing the road).</i>
qli-12.02	-.326	<i>To consider as a life-quality indicator (for their mobility) the ease to drive their own car.</i>
age_gr	.309	<i>Senior's Age [group].</i>
bar-13.07	.267	<i>To consider as barrier (for their mobility) the public transport transfers that are not well designed (e.g. when changing lines seniors must overcome long distances, barriers and busy roads).</i>
qli-12.03	-.262	<i>To consider as a life-quality indicator (for their mobility) the ease to afford the regular needs for mobility, e.g. petrol for the car, taxi,... (no financial problems).</i>
sol-14.13	.255	<i>To consider as urgent solution (for enhancing their mobility) to prolong the crossing time at some traffic lights and pedestrian crossings (green-times) for pedestrians.</i>
bar-13.15	.209	<i>To consider as barrier (for their mobility) the inconsideration of car drivers (bad manners and arrogance, fast and aggressive way of driving, lack of responsibility).</i>
sol-14.19	-.189	<i>To consider as urgent solution (for enhancing their mobility) to be able of wearing (carrying with him/her) a cellular/mobile (ordinary) telephone.</i>
qli-12.14	-.185	<i>To consider as a life-quality indicator (for their mobility) the ease to find that public transport drivers facilitate slower moving older people.</i>
sol-14.12	.123	<i>To consider as urgent solution (for enhancing their mobility) to introduce greater enforcement of speed restrictions to reduce pedestrian accidents.</i>
sol-14.09	.108	<i>To consider as urgent solution (for enhancing their mobility) to introduce more low-floor vehicles: buses with low platforms, and kneeling buses.</i>
bar-13.11	.105	<i>To consider as barrier (for their mobility) the lack of toilets in public spaces.</i>
qli-12.04	.093	<i>To consider as a life-quality indicator (for their mobility) the ease to find company / companions for going out and about (some one to walk with and to talk to).</i>
qli-12.06	.049	<i>To consider as a life-quality indicator (for their mobility) the ease to access resting places and seating areas in public places.</i>
sol-14.06	.023	<i>To consider as urgent solution (for enhancing their mobility) to increase the sense of security and safety of older people (e.g. extra police presence, security cameras at public transport stops and stations).</i>
sol-14.18	-.011	<i>To consider as urgent solution (for enhancing their mobility) to nominate a "Senior Citizens' Representative (or Campaigner)" in each level of Administration (municipal, councils, ..., EU government).</i>

In both analysis, the negative sign of the structure coefficient, corresponding to this predictor variable, indicate that the circumstance of having a mobile telephone characterises those senior citizens with a high level of autonomy/independence (group with negative centroid).

5.- Conclusions

From our research results, three conclusions can be made:

Firstly, the discovery of the role of the ordinary mobile telephone as an enhancing factor for the mobility and autonomy of senior citizens in Europe. Concerning this result and looking further into it, it is important to highlight that the single and simple circumstance of having an ordinary mobile phone may be a sufficient condition for going out of doors.

Secondly, this circumstance, that senior citizens could have mobile phones with them, has not received the attention level by politicians, technicians and decision makers which it seems to deserve as a ***telematic solution for enhancing and/or keeping the mobility, autonomy and independence, of our senior citizens***, in the European Union. This solution was considered (significantly in the statistics) less urgent by "experts" group than it was considered by the senior citizens themselves.

And thirdly, this circumstance of having an ordinary mobile phone, appears as an important predictor variable of their autonomy-independence, ahead of some variables related with public transport facilities, in this population group in Europe (at least).

The importance of this new telematic device as a factor for enhancing the mobility and autonomy of senior citizens has to lie in the fact that the mobile phone gives to senior citizens security to go out of doors. The security that offers the possibility of making contact with the family, health centres or help services when they want.

Consequently, the ordinary mobile telephone has to be included within the group of telematic devices used to ensure safe transport.

IMPLICATIONS FOR INDUSTRY

As consequence of this "new" role given by senior citizens to the ordinary mobile phone, it would be convenient to pay some attention to the question of how to transform mobile phones so that they become more accessible devices to this collective, which includes people with some kind of disability (motor, visual, auditory,..). So, based on some of the few studies in this direction (IMSERSO, 2004; Collado et al., 2005; Lopez et al., 2005) and on our own experience we want to offer some recommendations to the industry. These recommendations have to affect aspects of both hardware and software.

Hardware oriented recommendations affecting the design of phone terminals. They would be the following:

- a) Big screens, in order to allow big letters and numbers, and great audio capacity.
- b) Loud ring and vibration mode.
- c) Loud speaker for running in the "hands free" mode. Automatically activated with determinate actions or kind of calls (e.g.: pushing special or programmed keys such as an emergency key or pre-programmed numbers).
- d) Separate and big enough keys, which allow greater tolerance of motor mistakes.
- e) Special key (separate) for emergency number, activated only by pushing once which would turn on automatically the loud speaker.
- f) Numeric keys with the possibility of being pre-programmed with determinate numbers to call them directly only by tapping once and so avoiding the agenda and searches, with automatic switch on of loud speakers when activated. The programmed numbers will be dialled automatically (sons, partner, brothers, physician, hospital,...) turning on the loud speaker automatically.

- g) Handle to hang the phone from the neck (if necessary).
- h) Easy connection to the power supply to charge the battery (plug not too much little).
- i) Few extra functions (games, messages, photos, etc.) which overcharge its use and consume the battery, rather, long battery life.
- j) Water and shock resistance.

And

- k) Preferably with active lid (response only lifting or sliding lid) or with automatic response, to avoid blocking the keyboard thus preventing accidental activation (necessary in models with an uncovered keyboard).

Software oriented recommendations affects the offer of tariff options (calling plans) by the operators. Operating companies, which cannot ignore that these new devices could bring new users, have also to take part in these initiatives of adaptability and accessibility. So, it would be necessary to introduce a special tariff type for senior citizens. From our point of view, this tariff type (in some countries called "call plans") should be designed according two basic characteristics:

- 1) Only calling functions, in other words, no possibility of receiving or sending messages (or the possibility of disabling these functions) or other services which could provoke changes in the screen's normal aspect. Our experience says that for older people it is a cause of disturbance that the screen changes from that to which they are accustomed. The companies are in the habit of sending messages offering offers, news and diverse information that produce an immediate effect in the appearance of phone terminals, and this produces insecurity, and lack of confidence and anxiety in older owners.
- 2) Emergency and programmed number calls (to programmed keys) should be automatically operated by any company whatever the company contracted may have been.

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