

**Silver Generation and Internet Use:
Role of Cognitive Age and Loneliness**

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Abstract: This paper seeks to identify the effect of two variables (*i.e.* cognitive age and loneliness) on the internet adoption by Tunisian older people. 146 surveys were completed. Results revealed a significant relationship between chronological age and perceptual age. It is also found that family isolated respondents are likely to use internet for surfing on the web. No significant relationships between social loneliness and internet used have been found.

Key words: seniors, loneliness, cognitive age, internet use

Introduction

The generation of baby boomers has been progressed with mass marketing. Seniors have lived both the expansion of television and then the emergence of the Internet (Lee and Kiley, 2005). They believe that the Internet is an application used by commercial companies (Olphert, 2005). A large number of individuals are not aware that e-mails are part of the Internet Olphert, (2005); they consider it as a separate source of communication. Some seniors refuse depending on technology (Fleming, 2004) because the use of the computer is an unusual activity in their lives (Selwyn, 2004). Some seniors refuse using Internet in order to preserve traditional forms of social interactions, they try to avoid the disadvantages they perceive in the use of Internet (Olphert, 2005).

Abernathy (1999) estimated that 72% of Internet users who are aged 50 years or more use emails. 74% of seniors connect for medical information (Polyak, 2000) and seek information about their health (Daulerio, 2001; Gervery and Lin, 2000) or have the support of social and / or medical (Carpenter, 2000). Online seniors also find various information (Gervery and Lin, 2000 search the news (Gervery and Lin, 2000; Abernathy, 1999). On the other hand, Allardice (2001) assumes that seniors visit the web for leisure.

The development of virtual market engenders several questions among academics who attempt to explain the behavior of individuals towards the use of the Web when they browse, seek information and buy Online. Seniors, as part of this growing market, are enjoying a special interest in research these last few years. According the UNO, 20% of the world population will be aged 60 and over in 2050. That is why some academics called it the “*Silver Tsunami*” (Fox, 2001). As for Tunisia, the population of the country has seen since 2010, a decrease in people aged between 20-59 years and an increase of those who have more than 60 years (NIS, 2005)¹. The purchasing power of seniors is important (Reisenwitz *et al.* 2007) although they are considered as “invisible consumers” (Visvabharathy and Rink, 1986). Often ignored by the research because they are supposed to be resistant to new products (Szmigin and Carrigan, 2000), especially when products are related with technologies. The investigations in this area are almost nonexistent for the Tunisian market. This generates questions about the factors that may motivate or inhibit the cyber-senior to use self-service technologies.

The age of the individual causes an inability to maintain social contact, due to his deteriorating physical or cognitive (Dykstra *et al.* 2005) and the loss of a spouse (Tilburg, 2008; Dykstra *et al.* 2005). Seniors to compensate by attending cafes, spending hours in front of computers (McLuhan, 2000), seeking new membership groups and clubs adhering to cultural and / or sports (Pretty, 2006). Note that cognitive age plays a more important role than chronological age (Iyer *et al.*, 2008; Simcock *et al.* 2006; Safraou, 2006). On the other hand, some researchers advocate that loneliness pushes seniors to use the Internet. This phenomenon has been attracting the interest of sociologists and psychologists (eg Brenda *et al.*, 1999; Dykstra *et al.*, 2005; Kim *et al.* 2005).

Purpose of the study

Internet becomes a necessity; it is omnipresent in individuals' life. With internet, older people might enjoy several activities from their homes such as surfing on social networks or bill payments, medical information, vacancies reservation, etc. In fact, self-service activities may be beneficial for seniors who are in general limited in mobility (McMellon and Schiffman, 2000). While studies in older consumers have attracted researchers from different parts of the world, research on this nature in Tunisia is relatively new. The aim is to investigate the role of cognitive age and loneliness on the internet use behavior.

1 <http://www.ins.nat.tn/indexfr.php>

Theoretic basis

1. Silver generation

Reaching the age of a senior is manifested by physical problems, cognitive difficulties (Schewe, 1989) and a degradation of information processing (Phillips and Sternthal, 1977). From a sociological standpoint, it is the age at which the individual undergoes mutation within the family, becomes increasingly dependent on others with the beginning of health problems (Penninx *et al.* 1999). It became particularly important to understand the behavior of seniors with technological advancement because they are part of daily life (Mead *et al.* 1999) and are increasingly using Internet. Selwyn *et al.* (2005) indicate that this category of consumers generally use computers to keep in touch with others. The "Silver Surfers" recorded large online community participation (Sherry, 1999; Cleaver, 1999).

There is no consensus about the age of seniors. Many researchers consider a senior, a person who is at least, 55 years old (Vuori *et al.*, 2005; Price *et al.*, 2000; Penninx *et al.* 1999; Moschis and Mathur, 1993; Fox *et al.*, 1984), while others set the limit at 65 years (Day *et al.* 1987; Lumpkin, 1985; Russel, 1980). Other studies hold the minimum age of 50 years (Pak *et al.* 2008; Dychtwald and Flower, 1989; Barto's, 1980). Table 1 presents different previous studies of the use of internet by elderly people.

2. Loneliness

It is considered as a feeling like joy; hunger or pain (Sawir *et al.* 2008). Young (1982) defines it as the absence of satisfaction of social relations, accompanied by psychological troubles. Loneliness is the discrepancy between interpersonal relationships perceived by a person and those that he or she wishes to have (Sermat, 1978). This is due to an experienced social failure in term of the quality or number of relationships (Perlman & Peplau, 1981).

Solitary individuals often have a sense of emptiness (Weiss, 1973). Sawir *et al.* (2008) explains that the personality is a major factor in the exposure of the individual to loneliness; it can also be due to integration difficulties (Gardner *et al.* 2005).

There is a distinction between the loneliness of social isolation and emotional loneliness (Green *et al.* 2001; Di Tommaso and Spinner, 1997; Weiss, 1973). Emotional loneliness is in turn divided into two categories: family loneliness and romantic loneliness (Di Tommaso *et al.* 2003).

2.1. Emotional loneliness

According to Weiss (1973), emotional loneliness is defined as the absence of close emotional attachment; he also notes that this feeling occurs due to loss or lack of an intimate relationship with the spouse, parent or a child. Emotional loneliness arises when a relationship is dissolved by divorce or widowhood and is characterized by intense feelings of emptiness and despair (Gierveld, 2006).

Table 1. Synthesis of work treating the use of Internet by seniors

Authors (year)	Title	Méthodology	variables
Walsh and Callan (2010)	Perceptions, Preferences, and Acceptance of Information and Communication Technologies in Older-Adult Community Care Settings in Ireland: A Case-Study and Ranked-Care	Qualitative investigation: 4 case-studies 3 focus-group	Perceptions of Technology Acceptance of Technology

Program Analysis

<p>Cresci, Yarandi and Morrell (2010)</p>	<p>Pro-nets versus no-nets: differences in urban older adults' predilections for internet use</p>	<p>Quantitative study</p>	<p>-Information technology use -Health Variables -Computer use</p>
<p>Vuori <i>et al.</i> 2005</p>	<p>55+ people as internet users</p>	<p>Quantitative Study</p>	<p>Internet experience and use Frequency of online shopping Attitude towards Internet</p>
<p>Hogeboom <i>et al.</i> (2010)</p>	<p>Internet use and social networking among middle aged and older adults</p>	<p>Quantitative study</p>	<p>-Internet use -Social networks</p>
<p>Broady, Chan and Caputi (2010)</p>	<p>Comparison of older and younger adults' attitudes towards and abilities with computers: Implications</p>	<p>Review of literature</p>	<p>-Barriers to the older person's acceptance of technology and</p>

			overcoming them
	for training and learning		-Older adults' positive views towards computers
Peterson and Prasad (2011)	Easy life, intelligent systems, and life 2.0: European research on ict for aging adults	Literature review	-Age -Information and Communication Technology
Callaria, Ciairano and Re (2012)	Elderly-technology interaction: accessibility and acceptability of technological devices promoting motor and cognitive training.	Qualitative Study	Interaction with technology Technological acceptability
Brenda <i>et al</i> 1999	Social Network, Social Support, and Loneliness in Older Persons With Different Chronic Diseases	Quantitative study	- The state of the chronic disease - size of the social network

Fox *et al*
1984.

A longitudinal analysis of
consumer behavior in the
elderly population

Descriptive Study

-loneliness

Practices and
behavior of the
seniors on line

2.2. Social loneliness

Social loneliness is the feeling caused by a perceived lack of social interactions such as engaging friendships, collegial relationships, or other links within a community (Weiss, 1973). It is characterized by boredom and a sense of exclusion (Weiss, 1973). Gierveld, (2006) defines social loneliness as a lack of relationship with others which its intensity varies from one individual to another.

When an individual is accepted and incorporated, it acquires positive emotions like happiness, commitment and confidence. However, when he feels the separation, exclusion or ignorance, he often proves negative feelings such as anxiety, unhappiness, jealousy and loneliness (Osterman, 2001). Loneliness occurs in all age categories, genders and social levels (Gierveld, 2006). Yang (2009) found that social loneliness is greater among women than among men.

3. Cognitive age

The cognitive age is mainly studied in marketing to understand seniors' consumption tendency (Evanschitzky and Woisetschläger, 2008; Simcock *et al.* 2006; Moschis *et al.* 2006). Persons see themselves younger, more confident and involved in the search for new experiences and adventures challenged (Schiffman and Sherman, 1991).

The cognitive age is defined as the age of the individual thinks he has (Stephens, 1991). According to Barak and Schiffman (1981), cognitive age is based on four main dimensions "feel age", "look age", "do age" and "interest age." The cognitive age is considered as a factor in seniors' lifestyle (Iyer *et al.* 2008). It contributes much more than the chronologic age in understanding the behavior of the elderly and their consumption patterns (Barak and Schiffman, 1981).

4. Hypotheses

Relationship between chronological and cognitive ages

Past studies have found chronological age to be an antecedent of cognitive age (Ong *et al.* 2009, Logan *et al.* 1992). Being old has an

important role to play in individual's feeling Ong *et al.* (2009) concluded that there is a positive correlation between chronological and cognitive age. The difference between cognitive age and chronological age guarantees largely self-esteem, provides satisfaction of the social life and can be strengthened by using new technologies (Iyer and Eastman, 2008). It is posited:

H₁: chronological age is positively correlated with cognitive individual's age

Relationship between cognitive age and internet usage

Cognitive age has been found to be an important predictor of consumer behavior (Chang, 2008). Individuals behave according their feelings and what they think about their ages (Barak and Schiffman, 1981). "For example, elderly people who think they are younger tend to be less traditional and old fashioned (Barak and Gould, 1985)" (Chang, 2008) and they are more likely to use high-tech products (Wei and Bei, 2003) and Internet (Chang, 2008).

Particularly, seniors who have a cognitive younger age are more sensitive to the search for new information (Sherman *et al.* 2001) and more likely to use Internet (Reisenwitz, 2007; Carrigan *et al.* 2000) and use products originally conceived for younger people (Ahmed, 2002). Thus it is posited that:

H₂: seniors with lower cognitive ages are more likely to use internet for (1) surfing and (2) for buying

Relationship between loneliness and internet use

Loneliness is a serious problem that people daily encounter (Kang and Ridgway, 1996). It is associated with "Problematic Internet Use" (Moody, 2001). The importance of online communities for the elderly has received little attention in recent years (Wright, 2000; Furlong, 1997). Only few studies focus on the relationship between Internet use and loneliness among the elderly (Gross *et al.* 2002). When the baby-boomers move into retirement, they are increasingly using the Internet as a research tool, leisure and social activities (Reisenwitz *et al.* 2007). Internet provides the ability to perform active roles in society and also gives individuals the pleasure of being part of a group (Haddon, 2000).

People who are more socially lonely engage in communication through the Internet "web surfing" (Das *et al.*, 2003), because it can enrich and stimulate emotional experiences (Hoffman and Novak, 1996). Thus, people tend to spend more time for social virtual activities.

Among seniors, the use of the Internet for communication with family and friends is specifically associated with feeling of social isolation, but online communication with unknown persons is related to family loneliness (Sum *et al.* 2008). It was reported that loneliness represents an important predictor of internet use (Ceyhan and Ceyhan, 2008).

On the other hand, loneliness may affect impulsive or compulsive use of the Internet (Kim *et al.* 2009, Fullwood *et al.*, 2006) and impulse buying in the context of shopping (Lee and Fiore, 2009). The seniors probably make more purchases online and surf the Internet (McLuhan, 2000). On the other hand, they have some reluctance to make a payment online by giving references of their credit cards, the payment by invoice is preferred to the credit card (Belmiloud, 2000).

In the online context, Das *et al.* (2003) found that persons who suffer from social loneliness are more likely to engage in surfing and net communication and this does not confirm the assumption that these users necessarily become online compulsive buyers. We propose to study the effect of loneliness on the Internet for purchase.

H₃: There is a positive relationship between loneliness and internet use

H_{3,a}: there is a positive relationship between loneliness and internet surfing

H_{3,b}: there is a positive relationship between loneliness and online buying

5. Method

Sample

Online seniors were approached in a Facebook group which was created for this research "*j'ai plus que 50 ans, et j'ai un compte Facebook, ça vous dérange??*". The questionnaire was developed in French language. 146 surveys were completed and taken into consideration. Table 1 provides sample characteristics.

Table 1. Respondents' profiles

Characteristics		Frequency	%
Gender	Male	119	81.5
	Female	27	18.5
Age	[50-55[63	43.2
	[55-60[41	28.1
	[60-65[25	17.1
	More than 65	15	10.3
	Missing	2	1.4
	values		
Education	High school	36	24.7
	College/univer	108	74.0
	sity		
Matrimonial status	Missing	2	1.4
	values		
	Married	135	92.5
	Widower	5	3.4
	Divorced	6	4.1
	Less than one	22	15.1
Time	hour		
	Between one	77	52.7
	and three		
Reasons of internet use	hours		
	More than	47	32.2
	three hours		
Reasons of internet use	Professional	24	16.4
	leisure	28	19.2
	Both	94	64.4

Instruments

Cognitive age was measured with Barak and Schiffman (1981)'s four-items: feel, look, act and interests: "I feel as though I am in my————", "I look as though I am in my————", "I do most things as though I am in my————", and "My interests are mostly those of a person in his/her————" (Moschis *et al.* 2006).

Chronological age was obtained by asking respondents to indicate their year of birth.

The scale of loneliness *SELSA* (Social and Emotional Loneliness Scale for Adult) has been validated by Ditommaso *et al.* (2003). The authors have proposed a reduced version SELSA-S 15-item in order to simplify the administration for the elderly.

This is why we opt to use this scale because it allows us to measure both dimensions of loneliness, social and emotional dimensions with 7-Lickert points, ranging from "strongly disagree" to "totally agree". In the pre-test stage, we noticed that an important portion of respondents did not filled items related to romantic loneliness. We also received comments indicating that these items were daring and disruptive. In the literature, this dimension is considered a sub-scale (Ditommaso *et al.* 2004). This is why we permissible to remove the questionnaire because it does not affect the overall structure of the entire scale of loneliness.

In the literature, this scale is two-dimensional: social loneliness and emotional loneliness. In our study, the CPA with Promax rotation revealed two dimensions: social loneliness ($\alpha=0.74$ and family loneliness ($\alpha=0.68$).

Online behavior was measured by through dimensions related to "Internet surfing» ($\alpha = 0.81$) and "online shopping" ($\alpha = 0.92$) (Das *et al.* 2003). This scale is measured at 7-point Lickert scale ranging from (1) "strongly disagree" to (7) "Strongly Agree".

6. Results

The chronological age average was 57.02 years (SD= 5.9); whereas the mean for cognitive age was 41.08 years (SD=8.19). This indicates that respondents viewed themselves younger than their chronological ages. The difference age between chronological and

cognitive age is 16 years. The age difference found by Ong *et al.* (2009) was eleven years and Mathur and Moschis (2005) was 7.3 years. The first hypothesis was examined by Pearson correlation ($r = .353$, $\text{sig} = .000$); indicating that there is a positive correlation between chronological and cognitive age. Then, **H₁ is supported.**

In order to test hypothesis 2, Pearson correlation was used to examine the relationship between cognitive age and internet use. Results revealed no significant relationship between these variables ($r = -.041$, ns). Results suggest that internet usage did not depend on senior's cognitive age. Hypothesis 2 is **rejected.**

Multiple regression analyses were conducted in order to examine H3. Results shown in Table 2 reveal that only familial loneliness exerts a significant effect on senior's surfing behavior. All other variables did not display any significant result. H3 "there is a positive relationship between loneliness and internet use" is **partially supported.** Results suggest that when,

Table 2. Regression analyses

Dependent	Dimensions	Beta	t-test	Sig.	R ²	F-test
Surfing Behavior	Familial loneliness	.249	2.955	.004	.063	3.705
	Social Loneliness	-.54	-.614	n.s		

		s		
Buying behavior	Familial			
	lonelines	.163	1.864	n.s
	s			
	Social			- -
	Lonelines	-.098	-1,122	n.s
		s		

7. General Discussion

The main aim of this investigation is to understand the using of internet by elderly people in Tunisia. To do that we suggest that both loneliness and cognitive age might impact seniors' decisions. Two dimensions have been used for this purpose: loneliness and cognitive age.

Findings suggest that chronological age is accounted for variation in cognitive age. This result is consistent with Mathur and Moschis's study (2005) and Onget al. (2009). Seniors in Tunisia perceive themselves younger than their chronological ages.

However, findings revealed that they are differences between results of the present research and those of some previous researches. According to Reisenwitz (2007), Carrigan et al. (2000), Mathur *et al.* (1998) and Iyer and Eastman (2008) seniors with low cognitive age are likely to use internet than those with high cognitive age. In this research, no significant relationships between cognitive age and

browsing or buying behavior have been found. Perceived age is not related to e-senior behavior. This might be explained by the differences in cultures

On the other hand, we explored the effect of social and family loneliness on internet usage. We found that only family lonely individuals are likely to use internet to surf but not to buy something through the web. Online communities can help overcoming cognitive and geographical barriers that often inhibit older people to participate in social activities (Jaeger et al. 2009). The active participation in these communities might improve the well-being of individuals (Shaw *et al.* 2002, Wright 2000), and allows them to form new relationships in new online communities (Jaeger *et al.* 2009).

Few investigations have integrated seniors' loneliness in the field of marketing. Some issues might be explored as future directions such as including larger sample and clustering individuals. Future research also might be needed to segment elderly people on the basis on other potential variables that may explain the seniors' behavior when using internet.

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