The mobility of elderly people: what are the differences between men and women?

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ABSTRACT

In this paper, we analyze the differences of mobility between men and women among the elderly in France. Taking into account gender in the mobility study gives a better insight of the needs of mobility in the elderly, often considered as heterogeneous. After tackling with the definitions, we analyze mobility of men a women aged 55 and over in France with the National Travel Surveys from 1973 to 2007, describing people's mobility and applying a cohort analysis to car licensing.

Mobility behaviors and differences between genders are all the more important than people age. These differences between genders are much more perceived in the *old-old* groups. They are the consequences socio-demographic characteristics - such as the household's composition, age, incomes - and the differences of behavior concerning modes of transport within generations. Even though inequalities between genders of car licensing may decrease, mobility habits of the earlier stages of life influence behaviors in the later life. As women quit driving easier than men, their modes of transport in later life may be restricted. With a percentage of 5% of common transport use of the *old-old* women, they do not compensate much by others means of transport.

Keywords: Mobility, elderly, gender analysis, cohort analysis, French National Travel Survey.

INTRODUCTION

Our study is carried out after a major law in France on accessibility in 2005 which states that every amenity must be totally accessible to everyone in 2015 and reveals that many elder people may keep encountering difficulties while travelling. What are their socio-demographic characteristics? Studies have been leaded out (Dejeammes, Benlahrech, Le Ruyet, & Livebardon, 2000; Dejoux, 2010; Pochet, 1995) and show that gender is

determinant in mobility among older people. In this study, we give a further insight on the elder people's mobility with the national travel surveys.

Mobility, social integration and quality of life in the elderly

Mobility plays a key role on quality of life, health and social integration (Hirvensalo, Rantanen, & Heikkinen, 2000; OCDE, 2001; Rosenbloom, 1999; Spinney et al., Scott, 2009). Economic growth, urban sprawl have come along with a general widespread of car, an increase of travels and the improvement of mobility since the second half of the XXth century: In 1973, 162 million of daily trips against 181 million in 2007 were estimated in France. These links between social and economic networks and mobility have got so narrow that nowadays, improving one's mobility is a *sine qua non* condition to integration. In our societies, mobility has indeed become a positive social value at the center of people's quality of life since they choose to perform their actions on society according to their abilities to move (Kaufmann, 2008). Thus mobility, as the ability to go from one place to another, is fundamental to achieve activities and live in societies.

Mobility cannot only be studied by counting trips: it is a part of the individual's decision to leave his/her home and face the public environment to perform an action on society. From this point of view, the individual makes the choice to achieve an activity according to his choice between the beneficial effect of the activity on his social role and his satisfaction while travelling (Zhao, Tyler, & Lan, 2012). Mobility is therefore determined by the individual himself, his environment and its accessibility, his satisfaction and feeling about the travel and accessibility. The ways people organize their travels and integrate it in their schedule are different: for instance aged people may organize their travel differently from newer generations using fewer technologic devices. Furthermore, some generational habits have evolved, implying differences in modes of transport especially more and more use of car among women (Roux, 2012b).

What are the mobility patterns of aged people in France? Many studies have pointed out the limitation of mobility with ageing, particularly among the people aged 75 and older abroad (Mitchell, 2003; Rosenbloom, 1999). How and why do they move in France? What are the differences among them? This study aims to evaluate the elderly mobility and to highlight differences between men and women in France in order to anticipate their needs.

Gender differences

Compared to elder men, elder women's mobility differs on many points: fewer trips travelled, shorter distances, less time spent for travelling (Dejoux, 2010; Hjorthol, 2013; Kalinowska & Kunert, 2009; Mitchell, 2003; Rosenbloom, 2007; Siren, Heikkinen, & Hakamies-Blomqvist, 2001). Besides these differences of quantitative indicators of mobility, women are expected to behave differently than men. Firstly, while driving a car remains the main mode of transport among the elderly, their decision to stop driving is more chosen than men (Burkhardt, Berger, & McGavock, 2000; Siren & Hakamies-Blomqvist, 2006). For instance, whereas men wait for their doctors to advise them to stop driving and continue to drive even though they may have some inabilities, women tend to stop driving on their own (Eberhard, 1996). Does this attitude reveal that women are less car dependent than men? In

the household, results have put forward that women tend to be more passenger than the major car driver in the household. The reason of the premature stop of driving may be in the difference of habits of driving among men and women (Siren & Hakamies-Blomqvist, 2006): as women are not used to driving, they have more difficulty in travelling by car so they'd rather stopping it prematurely. In the beginning of the 20th century, a woman driving a car in France has a long time been seen as a feminist feature. This historic perspective is not only the case of France (Siren et al., 2001). Later women were aimed by commercial advertising and car models were promoted among women but for a long time they had a passive role as passengers. Therefore, as we will see, this mode of transport is influenced by a strong generational effect. A second explanation could be that women do not account entirely on car in their transport planning and prefer using another mode of transport but as women who do not use car as a mode of transport generally travel fewer trips, this assumption seems specific to specific situations (for instance a woman who lives in town center without any disability and with a efficient common transport network). In that case, a cessation of car driving would not directly lead to a reduction of mobility but rather be a compensation of modal choice of transport and could have beneficial effect since it is anticipated. However cessation of driving is linked to a negative impact on mobility and can lead a depression (Siren & Hakamies-Blomqvist, 2006).

Some studies revealed that women are more dependants of the environment's negative impacts on mobility. Public transit is generally not one of their principal mode of transport since they often seem not enough convenient (Coughlin, 2009; Hjorthol, 2013). Furthermore, mobility is affected by well-being in an environment; hence fear of aggression restricts women's use of public transit at some hours and in dark areas (Keane, 1998). Older women who are single and of lower socioeconomic class, living in an urban area are more likely to fear crime (Keane, 1998). Furthermore, women with fear of crime reported lower relationships (activity, friendship, family). This perception women have on the environment that surrounds them may influence their travel patterns and modes of transport and restrict their mobility especially for older women (Loukaitou-Sideris, 2010).

Ageing and mobility

Ageing, on many points, is determinant in people's mobility; however before giving some reasons, we question the definition of ageing. The chronological age is the most precise value we have on ageing but this way of thinking ageing is tantamount to not considering the difficulties that appear with age and that restrict people's mobility, it can therefore be considered as a control variable (Arber, Davidson, & Ginn, 2003). Thus it becomes difficult to see the implications between the health problems and restrictions of mobility. Furthermore, many have pointed out the heterogeneity characteristics of the older people whereas the elderly is often seen as a bipolar group of *young-old* (65-74) and *old-old* (75 and more). The aged people will undoubtedly appear heterogeneous if we do not take into account neither sociodemographic characteristics affecting their whole lifestyle nor health factors determining the capability of practicing activities.

However functional limitations may appear with ageing (Cambois et al. 2005). These functional limitations, often linked with impairment can cause disability and social disadvantaged situations (WHO, 2001). According to Cambois et al. (2005) 50% of the

French population aged 55 and over report at least one functional problem. These limitations may influence people's choice on practicing activities of daily living (ADL) and furthermore, restrict their mobility (Shumway-Cook et al., 2002).

To overstep the limitation of chronological ageing, three distinctions of age were proposed: chronological, functional age and in terms of major life events (Arber & Ginn, 1991). These three approaches to tackle with ageing refer to different conceptions. The first one reflects the exact age of a person since she was born. This chronological age is important since it permits to identify the legal age with important steps of a life cycle at 18 in France for adulthood or 65 for retirement. The second one reflects the difficulties that may appear with ageing: this is not because a person is (chronologically) aged that she is physically restricted. Even though there is a link between ageing and deteriorating of health conditions, this feature is not the same for everyone. Stereotyping ageing and ability restrictions (Siren et al., 2001) may lead to a negative image of ageing (Townsend, Godfrey, & Denby, 2006). Finally, the major life events indicate the social roles a person is having in his life. Differences between biological, psychological and social ages were also put forward allowing pointing out the limitation of psychological functioning. This psychological age allows revealing three consequences of ageing that are the cognitive functioning, psychomotor performances and personality. The personality can be considered as the synthesis of the different roles of a person according to the stages of his social life. For example an individual passes from the status of parent to grandparent and disengages from his personal earlier roles. These changes of roles can affect the relationships to others.

We can indeed expect the life cycle to provoke changes in people's mobility patterns. With ageing, individuals' social roles influence their daily living and therefore their mobility. Aged people's behaviors evolve according to their past situation triggering generational effects: new generations of women have known changes compared to older generations such as abortion, new methods of contraception and their participation to the labor market (Arber et al., 2003). The income, the marital distribution and family relatives are influenced by the past situations and may affect their roles.

In France, life expectancy at age 0 is 85 years for women and around 78 years for men (INED, 2013). This difference may lead to particular situations such as a higher proportion of women among the people aged 75 and over, widowed and living alone. These facts may greatly affect women's mobility if they were used to move accompanied.

METHOD

In this paper, as we aim to give a better insight of older people's mobility and particularly the differences between men and women, we compute the results from national travels surveys from 1973 to 2007 (1973, 1981, 1993, 2007). These surveys give an insight of individuals' socio-demographic characteristics and their mobility: in terms of trips, distance and length travelling. Furthermore we have information of the modes of transport and travel patterns. These national travel surveys are the only surveys carried out on a national basis on mobility. More precisely, we will focus on the last survey (2007-08). This survey contains a sample of 45,000 individuals from the 1999 population census. Therefore, the survey represents the population that does not live in institution in 2007-08 in France.

A trip is defined as a movement from a place to another for the achievement of a pattern. Local trips are distinguished as soon as they are in a range of 80 kilometers from home (Armoogum et al., 2011). In this paper, only the local trips are considered since we analyze daily mobility. Unfortunately, in the French Travel Surveys, restrictions of activities of daily living or eventually impairment are not taken into account. Only one question concerns impairment: "*Do you feel difficulty while you're travelling?".* We will consider the chronological age since we do not have data that allow to take into consideration health of the individuals.

Plus, we consider mobility of the population aged 55 and more instead of starting the comparison at the age of 60 (age of the legal retirement) in order to check differences between active and retired people we analyze mobility with indicators such as the number of weekly trips per day, their time length and distance, modes of transport used, travel patterns. Indeed trips per day represent the number of trips the person report having travelled during a reference day (the last week day before the interview).

After describing the mobility in France of the 55 and more, we study the car licensing by means of a cohort study from 1973 to now.

RESULTS

In this section, we report the results from the French national travel surveys. Firstly, we give an insight of the sociodemographic characteristics of people aged 55 and over.

Difference of mobility between men and women in 2007 – 08

There are about 17 million individuals aged 55 and over in France according to the NTS (National Travel Survey) of 2007. Some differences appear when gender is distinguished: women feel more difficulty while travelling, their household's income distribution is much lower tailed that men's distribution (half of them live in a household with less than 1600 euros per month), one out of four live in a household without any vehicle, four out of five have a diploma lower than *baccalauréat* and 10% of them are inactive. Furthermore, the proportion of women in household of one person is 35%, 20 points higher than men's proportion concurrently to 21 points less than men in the *couple* classes.

Variables		Men	Women
Age	55 - 64	47	40
	65 - 74	29	29
	75 and over	24	31
	Persons Feeling difficulty while travelling	19	26
Household	One person	16	35
	One-parent family	3	5
	Couple without children	63	48
	Couple with at least a children	14	7
	Other	4	5
Household's incomes	Less than 1600 €	38	50
	[1600 ; 2400 [	25	22
	[2400 ; 3400 [	17	14
	3400 and more	20	14

Residential area	Inner city	39	42
	Outer city	32	32
	Suburbs	29	26
Motorization	No automobile	11	25
	1	49	47
	2 or more	40	28
Professional activity	Inactive	1	11
	Retired	24	18
	Active	75	71
Frequency		7,7 million	9,4 million

Table 1 - Socio demographic characteristics

Source: Enquête nationale Transport et Déplacements[1] 2007 – 08, INSEE-SOeS-INRETS

As women live longer than men, it is not surprising to see more women than men in the age band 75 and over. This fact involves differences of sociodemographic characteristics: more women feel difficulty while travelling than men (Casas, 2007; Dejoux, 2010), these difficulties may come from disability, from the environment that is not enough accessible to the places of interests and amenities. Furthermore, as a consequence of widowhood and single life, more women than men live alone in their household. In the case of widowhood, living alone can be determinant in women's mobility since many among them used to be a passenger in a car. Therefore, if they are unable to drive, they have to think again their mode of transport, asking to their surroundings or use a transportation service.

Figure 1 represents the 10 years moving average[2] of men and women trips per day. A moving average is used in order to smooth the trends and lighten volatility and the trips per day represent the average of weekly local trip men and women make. Overall the number of trips per day decreases much more for the *old-old* than for the *young*-old. From 55 to 69 years old, there is no significant difference between the number of trips per day of men (2.9) and women (2.8). Although trips per day are very close at 70 years old, differences tend to increase between men and women from 70 to 90. Women aged less than 55 make more trips per day than men (3.6 against 3.3) and women aged from 55 to 64 years old make 2.8 trips per day against 2.9 for men (no significant differences). Thus, the main differences of trips seem to appear with ageing. The estimated parameters of the impact of age on trips per day (-9%) show that from 70 and over the decrease of trips per day per age is faster for the *old-old* than for the *younger-old*.

[1] National Travel Survey

[2] $\mathrm{MA} = \sum_{k=1}^{5} \frac{\mathrm{trips}_{age-k+1}}{5} + \sum_{k=1}^{5} \frac{\mathrm{trips}_{age+k}}{5}$

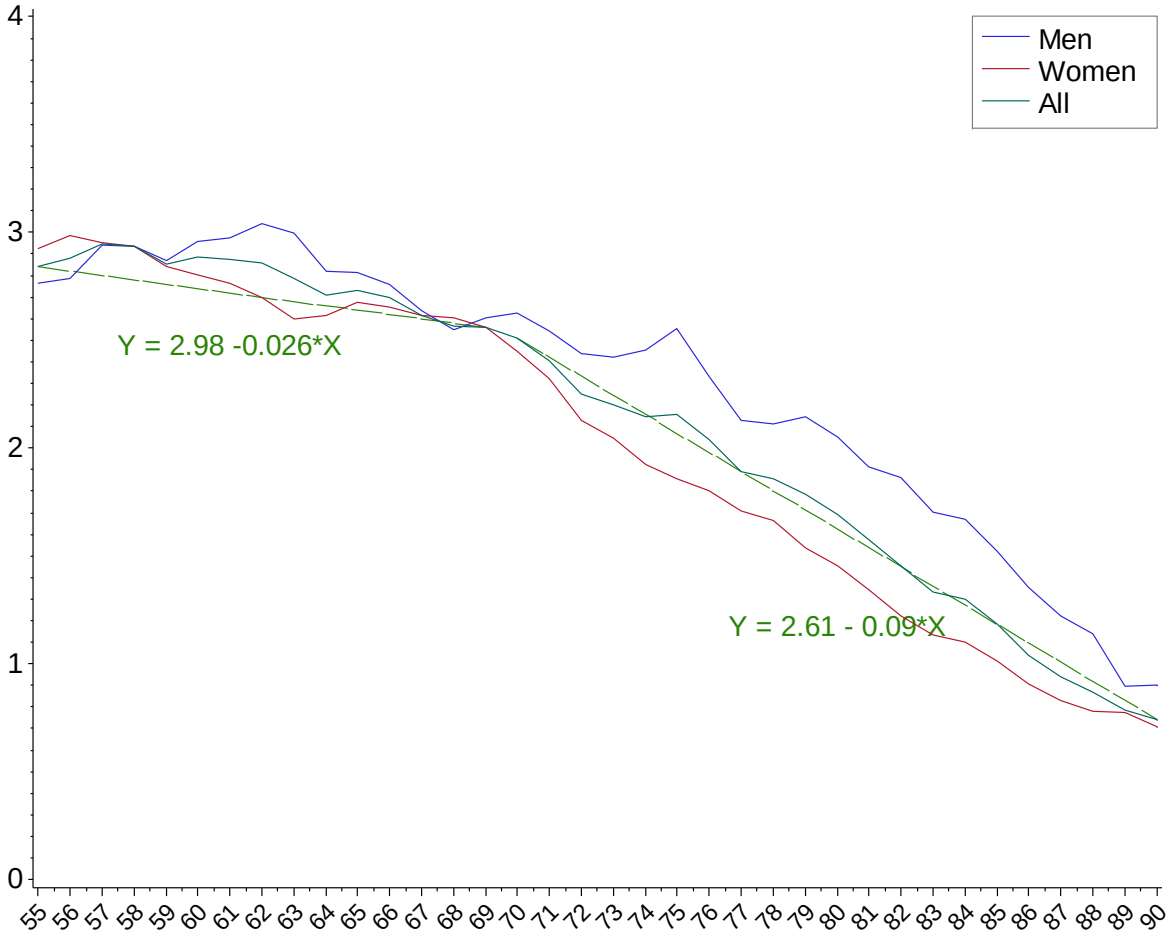

Figure 1- Men and women trips per day per age

Source: Computation from Enquête nationale Transport et Déplacements (National Travel Survey) 2007 – 08, INSEE-SOeS-INRETS.

These figures are influenced by a larger part of women who did not make any trip on the reference day of the week: they are 29% among women and 24% among men aged 55 and over. Concerning the ones who traveled on the reference day, if we count the kilometers and time spent (in minute) by trip, they both overall decrease from 55 to 90. Men travel on longer distance and spend more time travelling than women. At 90 years old, the average number of kilometers per trip tends to increase although the time spent travelling is decreasing. This increase can be or due to the inelastic character of the distance for the one who continue travelling at these ages because of a better accessibility among them (being transported as a car passenger or using on demand transport services too).

However the number of trips per day is influenced by socio demographic characteristic, professional activity (for the people aged between 55 and 64), so this higher average mean of trips per day among men and women hides differences of socio demographic characteristics which condition their mobility.

In this background, the more aged people are, the more differences of trips per day appear, the fewer kilometers they travel, the least time is spent travelling.

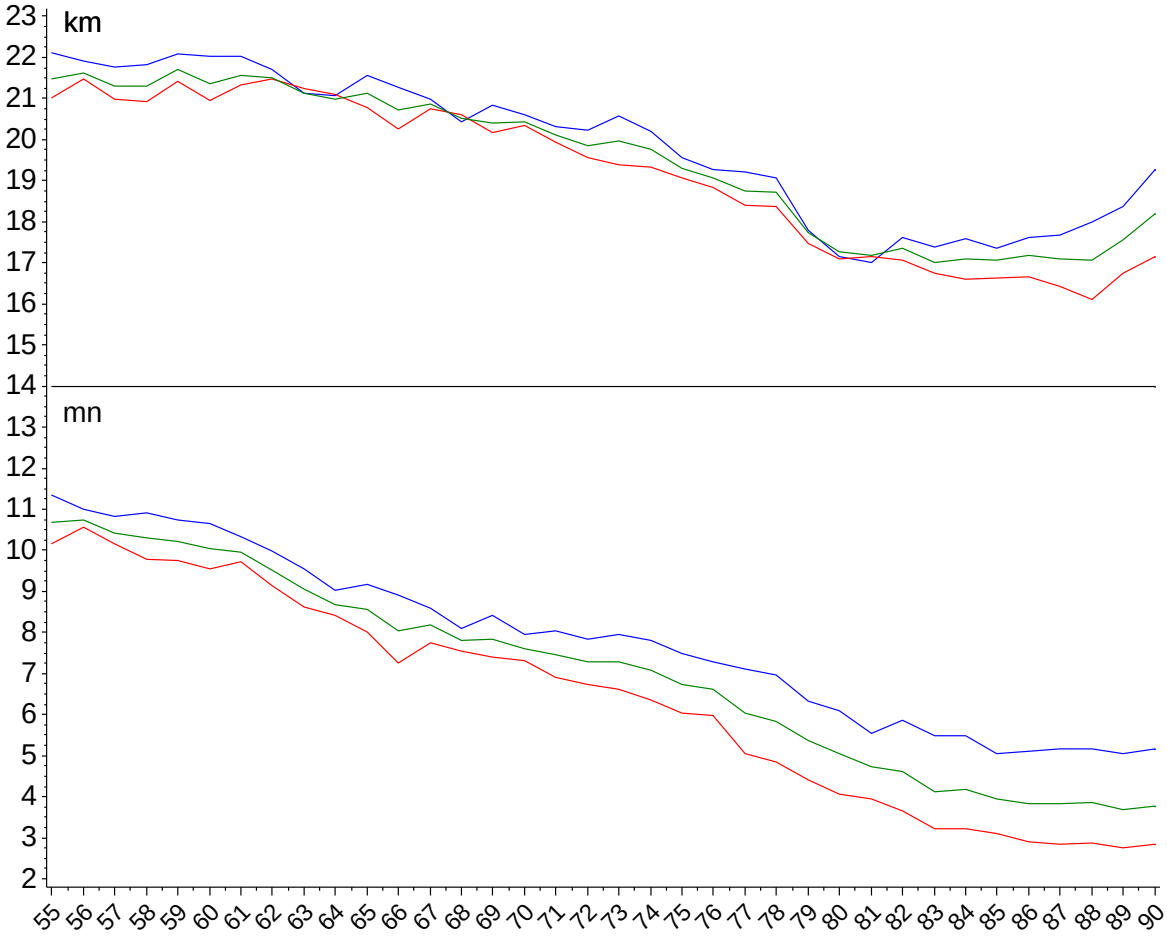

Figure 2 – Kilometers and time spent per trip

Source: Computation from Enquête nationale Transport et Déplacements (National Travel Survey) 2007 – 08, INSEE-SOeS-INRETS.

On the one hand, whatever their age (over 55), women are more pedestrian than men: from 20% to 40% of their weekly travel are done as pedestrian. On the other hand, they are much fewer drivers than men. While driving a car is by far the most used mode of transport (from about ¾ for the men aged between 55 and 64 to 56% for the ones aged 75 and over), this mode of transport is only used for 51% of the women's aged 55 to 64 travels and decrease to 19% with ageing. Nevertheless when there are just a few parts of men being passengers, at least 23% of women (aged from 55 to 74) are passengers and this figure rises to 34% for the older ones. According to the literature, these figures are not surprising (Rosenbloom, 1996; Whelan, Langford, Oxley, Koppel, & Charlton, 2006). Even though walking may be more a constraint as the only mode of transport remaining than a deliberate choice, this mode of transport plays a key role on health (Simonsick, Guralnik, Volpato, Balfour, & Fried, 2005) despite the danger because of the public environment (Shumway-Cook et al., 2002). Finally, common transports are not much used whatever the age over 55

but this mode of transport is even more linked with the environment as the zone of residence, the economic choice of the public transport provider (Alsnih & Hensher, 2003), etc.

	Men			Women		
	55 - 64	65 - 74	75 and over	55 - 64	65 - 74	75 and over
Pedestrian	17	21	26	20	32	40
Two-wheeled	3	3	4	1	2	1
Car (driver)	73	67	56	50	38	19
Car (passenger)	4	6	11	23	23	34
On demand transport	0	1	1	1	1	2
Public transport	3	2	2	5	4	4
	100%	100%	100%	100%	100%	100%

Table 2- Mode of transport by gender and age (percentage)

Source: Enquête nationale Transport et Déplacements 2007 – 08, INSEE-SOeS-INRETS.

The travel patterns of the elderly does not differ much between men and women aged between 55 and 74 if we do not take into account the professional ones. Women make proportionally fewer travels for leisure activities whereas they make more shopping, or treatment and pay more visits than men. This higher proportion of visiting for women may be linked with their higher propensity to be a care giver. Analyzing travel patterns requires taking into consideration the accompanied travels and the repartition of the roles within household.

Pattern	Men			Women		
	55 - 64	65 - 74	75 and more	55 - 64	65 - 74	75 and more
Return to the starting point	42	46	37	42	43	42
Shopping	20	18	27	23	23	26
Treatment	2	2	3	3	4	5
Administrative	2	2	3	1	2	1
Visit	7	8	8	10	9	9
Accompany	3	3	1	3	3	1
Leisure activity	11	19	20	13	16	15
Professional	10	0	0	5	0	0

Table 3 - Travel patterns by gender and age

Source: Enquête nationale Transport et Déplacements 2007 – 08, INSEE-SOeS-INRETS.

These results have pointed out some differences of mobility among elder men and women. Finally, men travel more than women, on longer distance and spend more time travelling. Yet these results are influenced by sociodemographic characteristics that must be taken into account. These differences tend to increase with ageing, revealing that women may have more difficulties in older ages even more when they become a widow that used to be a car passenger. But these differences reveal a dynamic in which one inequalities tend to decrease.

A cohort analysis of men and women car licensing

Driving licensing of women has kept increasing since the second half of the XXth century. Concerning men of the three last generations and aged 35 and over, more than 90% of them have had a car license whereas this is only the case of the generation 1960 – 69 of women. Compared to men, women's car licensing has known a significant generational gap. Only around 50% of women had a car license in the generation 1950 – 59 and among this generation, car licensing has only slightly increased (of about 10 points). But car licensing among women has significantly improved from the generation 1930 – 39 to 1940 – 49 and this rise has kept on for the later generations. Between 35 and 44 years old, the newer generation analyzed of men and women have about the same proportion of car licensing showing that inequalities of car licensing have widely narrowed between men and women although they keep existing (Roux, 2012a).

However the distribution of non-driving habits among the car license owners is not the same according to gender. While fewer than 5% of car license owners among men never stop driving (whatever age and generation), this is the case of a much more important proportion of women. Concerning women, we can point out two major features. Firstly the more aged women are, the more they tend to stop driving; secondly, the newer the generation is, the fewer women tend to stop driving. For instance, among the women of the generation 1930 – 39 who had their driving license, around 5% of the ones aged between 35 and 44 stopped driving against 14% for the 45 – 54 and 25% for the 65 – 74 age class. Finally, we can point out that this rate among the 65 – 74 has decreased to 15% for the generation 1940 – 49.

These figures reveal that although inequalities tend to decrease concerning the driving license, the car usage keeps being gendered among generations. These inequalities tend to decrease among newer generations.

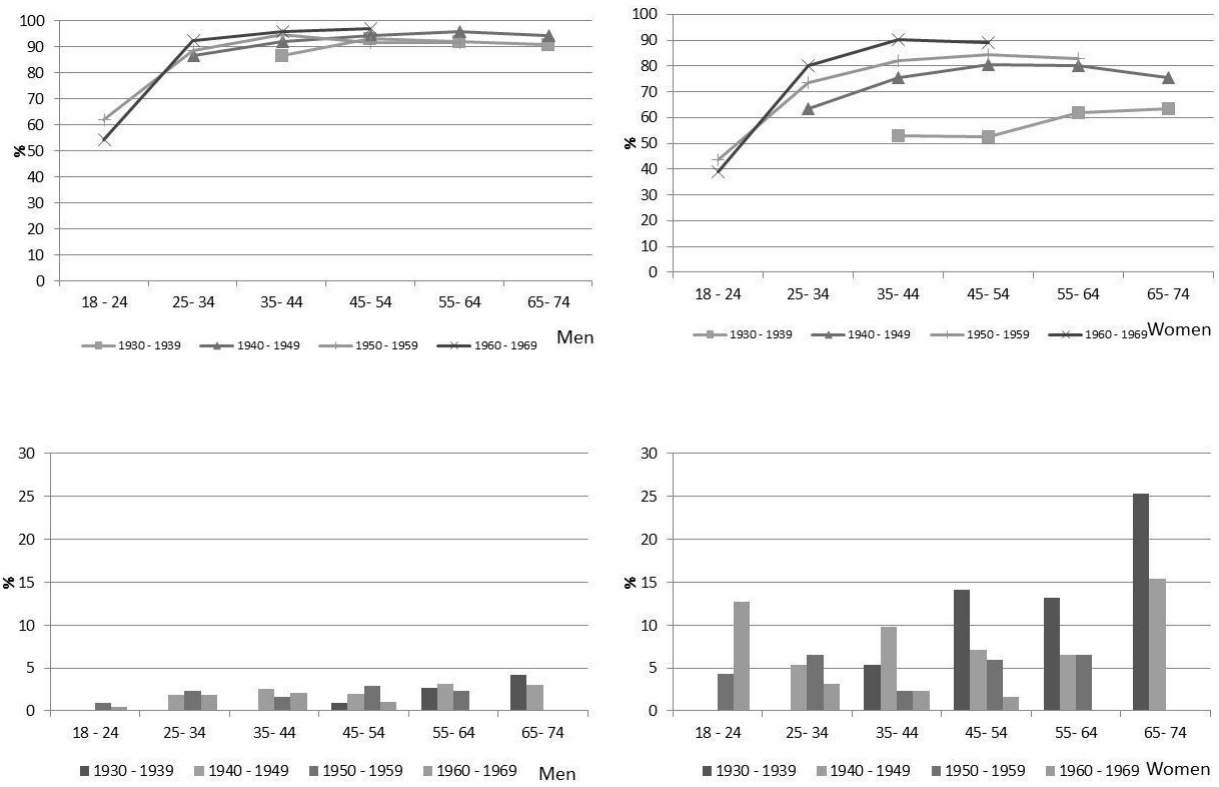

Figure 3 – Cohort analysis of driving licenses

Source: Enquête nationale Transport 1973, 1981, 1993, 2007, INSEE-SOeS-INRETS and (Roux, 2012a).

CONCLUSIONS

Trips per day do not evolve much on the first years of the elderly but tend to decrease (of around 9% each year) for the *old-old*. The higher part of people who do not leave their home is a cause of this decrease. The network and the spatial control seem to restrain in older ages since both men and women travel shorter distance per trip.

Older men and women have different socio-demographic characteristics that may influence their mobility. First of all, as women live longer than men, they are subject to longer living with functioning limitations (Sieurin, Cambois, & Robine, 2011). These functioning limitations may limit their mobility since they may encounter barriers, restricting their abilities, in their daily life (Casas, 2007; Dejoux, 2010; Shumway-Cook et al., 2002). As a consequence more of them feel difficulty while travelling because of a disability situation. These restrictions may cause all the more a disadvantage than some socio economic characteristics limit their influence and networks: lower incomes, widowhood, single life (more and more recurrent in newer generations). Secondly, they have different experiences of the labor market and constraints on domestic tasks (Kwan, 2000) which lead them to different mobility habits since they have to deal with other constraints of the daily life than me. Thus mobility of elder women may be influenced by their lower access to car (Siren & Hakamies-Blomqvist, 2006). Finally, generational effects play a key role in the explanation of these differences. As we saw, the car licensing has been democratizing on the second half of

the 20th century and allows the reduction of inequalities. However men and women still have different car habits since more women quit driving with ageing.

Therefore, gender is a key variable in the analysis of mobility in the elderly since women are an important part of the *old old* and subject to functional limitations; with lower incomes and quit more easily driving than men. Results from the cohort analysis have yet showed that inequalities tend to decrease between generations.

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