

GENDER SEGREGATION OF OLDER PEOPLE: THE CASE OF MEDITERRANEAN COUNTRIES¹

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1. Introduction

In the last twenty years, the population structure across European Countries has sensibly changed. For instance, the percentage of people aged 65 and above was 12.8% in 1985 and it has increased to 17.4% in 2010 (Eurostat, 2012). In fact, the ratio of population over 65 to total population has already become higher in Europe than in any other continent and data forecast the increment of this ratio in the 21st century. In the last decade, the European countries with the highest proportions of population over 65 are Italy and Germany, and these ratios increased continuously. For instance, Italy moves from 19% in 2003 to about 21,5% in 2013, whereas Germany passes from 17,5% in 2003 to 21% in 2013. If population over 65 is split into two groups: 65-79 and 80 and above, is the second group which has increased more than proportionally with respect to the first one in the period 1990-2010. The European Union is particularly sensible to this issue, as testified by its decision of designing the 2012 as the European Year for Active Ageing and Solidarity between Generations. The aims have been manifold: helping creating better job opportunities and working conditions for the growing numbers of older people in Europe, supporting the old people playing an active role in society, and encouraging ageing and independent living. The financing of the “Survey of Health, Ageing and Retirement in Europe” (SHARE) also evidences the growing interest on behalf of the EU on these issues. SHARE aims at collecting micro data (cross-national panel) of individuals over 50 years living in 20 countries (19 European countries plus Israel) respect to several variables related to health and socio-economic status and social and family networks. SHARE accounts for four different releases, called wave1, wave2, sharelife and wave4, published in 2004/05, 2005/08, 2009/10 and 2011/12 respectively.² Among the 20 countries participating

¹ Although all authors contributed extensively and in closely collaboration to the work presented in this paper, the Introduction could be attributed to all the authors, Section 2 to Lasso de la Vega and Ciommi, Section 3 to Ciommi.

² See www.share-project.org for more details.

in SHARE, we focus on five Mediterranean countries, namely France, Greece, Italy, Portugal and Spain. This selection is due to the higher incidence of aged population reported by these countries.³

Respect to this particular target population, we are interesting in analyzing the segregation of women and men in a number of attributes. Since the seminar paper of Duncan and Duncan (1955), the measurement of segregation has attracted the interest of researchers and a large body of both, theoretical and empirical work have been written to examine inequality in the distribution of people across groups (occupations, schools, or neighbourhoods). The literature on measuring segregation seeks to assess whether one distribution of people across groups is more segregated (less equal) than another distribution. For instance, occupational segregation measures the extent to which men and women, or different ethnic groups are concentrated in certain industries or occupations. As observed by Anker (1998), segregation may lead to labor market rigidity and to a reduction in the economic efficiency. For this reason, we hope that the evaluation of segregation may be a good instrument to better understand the structure of European society and plan possible strategies aiming at promoting integration among their citizens. In this analysis, we focus on two variables: education and occupation.

The rest of the paper is organized as follows. Section 2 describes the dataset used and the methodology. After defining what occupational and educational segregation is, we briefly introduce some segregation indices and the segregation curves. In turn, Section 3 is devoted to the analysis. In particular, we compute for the five mentioned countries and over time several segregation indices and analyse the results. Finally, we seek for possible dominances.

2. Data description and methodology

One way of establishing if a particular characteristic, e.g. jobs or educational level, is distributed in a gender, race, and ethnic blind form is by looking at whether certain types of such characteristic are more likely to have a larger percent of a certain type. This can be measured through the use of segregation indices that attempt to review whether there is a “larger” than expected presence of a certain group in any given attribute category.⁴ Economists, sociologists and demographers have been interested in analysing several aspects of segregation: occupational, geographical, residential, racial, religious, educational or gender, among others. In addition, their studies have been conducted both time-series of individual countries and cross-sectional. Among these analyses, occupational and educational gender

³ See Eurostat data available at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_r_d2jan&lang=en.

⁴ Obviously, segregation indices can be computed with respect to any another variable of interest considering different population groups.

segregation are the two areas of interest that have received and are receiving an increasing attention. In general, a gender segregation index allows capturing the extent to which women and men are unevenly distributed across one variable. In what follows, we adopt the standard definition of segregation in one attribute. In particular, scholars state that there is occupational or educational gender segregation when women and men are evenly distributed across occupations or level of education. However, such definition does not take into account the nature of the job or education allocation nor inequality.

2.1. Data description

The paper is based on data collected in three different periods, namely wave1 (hereafter w1), wave2 (w2) and wave4 (w4) collected in 2004/05, 2005/08 and 2011/12 respectively under the SHARE project. We compute segregation indices and segregation curves for five Mediterranean countries: France, Greece, Italy, Portugal and Spain, respect to two variables. The first variable refers to the job situation. The possible categories are: retired, employed or self-employed (including working for family business), unemployed, permanently sick or disabled, homemaker and other (specify). This variable allows comparison among countries for a fixed year and over-time. The second variable, education, is one of the most diverse international variables, since the school system is not homogenous among the European countries. SHARE uses the 1997 International Standard Classification of Education proposed by UNESCO. For this reason, the number of categories may vary among countries. For France, Italy and Spain data are available for the three waves, whereas SHARE contains only partial data for Greece (w1 and w2) and Portugal (w4). In what follows, we define occupational and educational segregation and we compute segregation indices as well as the segregation curves.

2.2. Evaluating segregation: measures and curves of segregation

Literature accounts for a huge number of different segregation measures. Most of these indices are borrowed from the inequality context and modified to account for segregation.⁵ One of the most famous has been introduced in literature by Duncan and Duncan (1955) (hereafter D). It is a powerful instrument to compute segregation in the case of two groups. D is defined as the half-sum of the modulus of the differences between the proportion of men and women from the various fields of work. In the case of occupational segregation, a value of X% means that you need to move X% of the workers to obtain equal distribution of Employment, that is the X% of members of the first group would have to change jobs for the

⁵ See Silber, 1989 for the relationship between inequality and segregation.

employment distribution be the same. In addition to the D index, we also compute further segregation indices, namely Karmel and Maclachlan index (1988) (hereafter KM) that is a transformation of D, the Gini Index of segregation (hereafter G) proposed by Silber (1989); the Hutchens (2004) square root (hereafter H) that is equal to one member of the Generalized Entropy Family for $\alpha = 0.5$ divided by 4. Finally we also compute the Mutual Information Index (hereafter M) proposed by Theil and Finizza (1971).⁶ Table 1 reports the formulation of the indices jointly with their minimum and maximum values. To complete the analysis we also compare all the countries for a fixed wave. However, a particular segregation index could lead to non-robust results. For this reason, we also propose to draw segregation curves.

Table 1 – Formula, minimum and maximum for the segregation indices.

f_i and m_i is the share of female and male in level i , F and M the total number of female and male, $f_i + m_i = n_i$ the share of individual in level i and $F+M=N$ the total population.

Index	min	Max
$D = \frac{1}{2} \sum_{i=1}^k \left \frac{f_i}{F} - \frac{m_i}{M} \right $	0	1
$KM = 2 \frac{F}{T} \frac{M}{T} D$	0	$2 \frac{F}{T} \frac{M}{T}$
$G = 1 - \sum_{i=1}^k \frac{f_i}{F} \left(\frac{m_i}{M} + 2 \sum_{s=i+1}^k \frac{m_s}{M} \right)$	0	1
$H = \sum_{i=1}^k \frac{m_i}{M} \left[\left(\frac{f_i}{F} \frac{M}{m_i} \right)^{0,5} - 1 \right]$	0	1
$M = \frac{M}{N} \log_2 \left(\frac{N}{M} \right) + \frac{F}{N} \log_2 \left(\frac{N}{F} \right) - \sum_{i=1}^k \frac{n_i}{N} \left[\frac{m_i}{n_i} \log_2 \left(\frac{n_i}{m_i} \right) + \frac{f_i}{n_i} \log_2 \left(\frac{n_i}{f_i} \right) \right]$	0	1

The segregation curves have been introduced by Duncan and Duncan (1955). Roughly speaking, a segregation curve is a variant of the Lorenz curve that is appropriate when considering inequality in proportions (E.g. white/non-white). It is built by plotting the cumulative fraction of one type against the cumulative fraction of another, with fractions ranked from lower to higher values of the ratio f_j/m_j . Similarly to the Lorenz curves, segregation curves yield a partial ordering of distributions. If both groups are equally distributed across the categories, the curve becomes the diagonal, and there is no segregation. Consequently, the higher is the distance of the curve to the diagonal, the more the population is segregated. Thus,

⁶ See Gradin (2014) for more details about the indices.

if the segregation curve for distribution x lies everywhere below that for distribution y , then distribution x is more segregated than distribution y . However, when they cross, no conclusion may be obtained.

3. Analysis, results and conclusions

For the five mentioned Mediterranean countries and respect to the two variables, we compute the five indices displayed in Table 1, trying to rank country from the most segregated to the less one. To ensure robustness respect to the rank we also compute confidence interval for the index. Table 2 reports some of the results of our computations.⁷

For instance, analysing the values of occupational segregation for Spain, the five indices are not concordant. If we look at D , we have a consistent ranking; $w1$ is the more segregated society whereas $w4$ the less one. However, according to H there is not unanimous ranking since the confidence intervals intersect. On the other hand, KM and G suggest that $w1$ is more segregated than $w4$ and $w2$ but no relationship between $w2$ and $w4$ is provided. Finally, M only ranks $w1$ above $w4$. This means that the only thing we have is that the job segregation in Spain declined over time. Unfortunately, with respect to educational segregation, the indices are unable to rank the waves. Occupational segregation in France is also decreasing. All the indices rank in an appropriate way $w1$ as more segregated than $w4$. In particular, the values of all the indices in the two periods are about halved. However, only KM defines $w1$ as more segregated than $w2$, also in this case no relationship is provided between $w2$ and $w4$. For France educational segregation, we obtain a partial dominance for D , KM and G since $w1$ is always more segregated than $w4$. According to KM and D also $w2$ is more segregated than $w4$. However, we cannot conclude if $w1$ is more or less segregated than $w2$ since the confidence intervals intersect. On the other hand, the remaining indices are unable to rank waves. Looking at the values of segregation indices for Italy, we do not reach any significant dominance: here there is not complete nor partial dominance. Finally, for Greece, we obtain that $w1$ is more educational segregated than $w2$ according to D and KM , whereas the rest of the indices cannot rank the waves. Hence, according to the five indices, there is not perfect dominance for occupation. Regarding the educational variable, taking into account the values of D , the comparison among countries along the waves allows us to conclude that Italy is the most segregated in all the waves. In particular, Italy is more segregated than Spain in $w1$, more segregated than France and Greece in $w2$ and, finally, more segregated

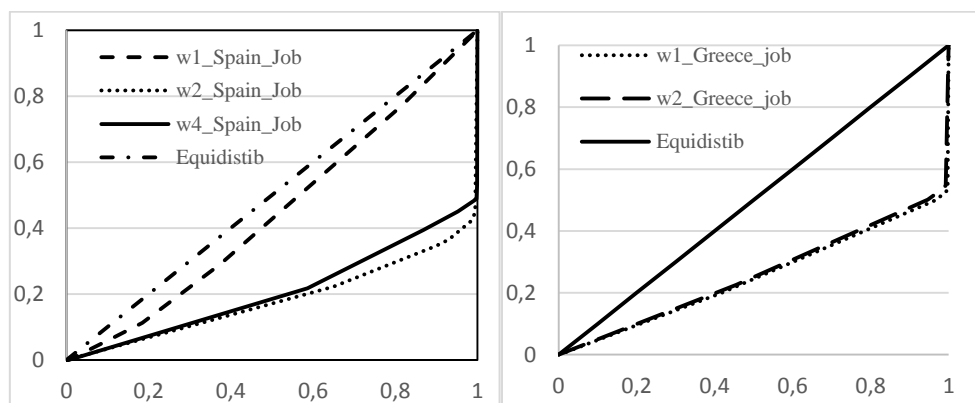
⁷ For all the countries and respect to the three waves, we compute the value of the occupational and education segregation indices as well as confidence interval for all the five indices. Given the cramped space, here we report only few examples. The overall (60x9) table is available upon request.

than Spain and France in the last wave. If we analyse occupational segregation, only w4 yields a total ordering ranking Spain, Italy, Portugal and France from more segregated country to less. Although w1 and w2 lead to partial orderings. We can conclude that Spain is the most segregated country across waves. Finally, we would like to stress that France shows very low levels of segregation according to D, recording about $\frac{1}{4}$ of the most segregated country.

Table 2 – Some results for D

Country	Wave	Occupational Segregation			Educational Segregation		
		Observed Value	Confidence Interval al 95%		Observed Value	Confidence Interval al 95%	
ES	w1	0,0837	0,0501	0,1174	0,6002	0,5686	0,6317
ES	w2	0,0890	0,0515	0,1264	0,5645	0,5299	0,5991
ES	w4	0,0507	0,0164	0,0850	0,5092	0,4803	0,5382
IT	w1	0,1727	0,1309	0,2145	0,4167	0,3873	0,4461
IT	w2	0,1272	0,0939	0,1604	0,4328	0,4069	0,4587
IT	w4	0,1610	0,1179	0,2041	0,4494	0,4042	0,4946
FR	w1	0,1154	0,0796	0,1511	0,1900	0,1699	0,2100
FR	w2	0,0731	0,0336	0,1126	0,1600	0,1299	0,1901
FR	w4	0,0323	0,0151	0,0494	0,1038	0,0731	0,1345
GR	w1	0,1323	0,0897	0,1748	0,4673	0,4369	0,4977
GR	w2	0,0523	0,0194	0,0851	0,4486	0,4216	0,4755
PT	w4	0,1418	0,0425	0,2411	0,3122	0,2231	0,4013

Figure 1 – Occupational Segregation.

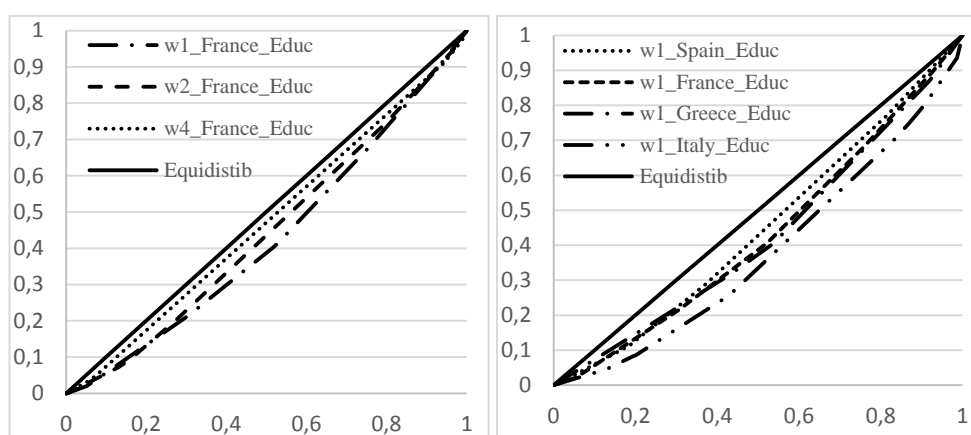


To conclude our preliminary analysis of aged people gender segregation, we report some segregation curves we computed. Comparing Spain and Greece, we note that the two countries are quite segregated since their curves are far from the diagonal line, except for w1. In particular, for Spain, w1 dominates both w2 and

w4 whereas the last two cross. On the other hand, Greece shows a similar pattern across waves and since curves intersect, no dominance is provided (Figure 1). Finally, if we look at educational segregation (Figure 2), France is reducing segregation over time. In addition, in w1 it dominates Italy and Greece.

Even if the curves, both with respect to educational and occupational variables, often intersect, they suggest a different scenario. In fact, it seems that there is a greater level of segregation in occupation than in education. Further analysis will be conducted involving more countries and making comparisons with different targets of the population.

Figure 2 – Educational Segregation.



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SUMMARY

Gender Segregation of older people: the case of Mediterranean countries

In the last years, economists and sociologists have been increasingly interested in segregation. Most of the empirical works examine the unequal distribution of different groups in the population, i.e. women and men, native and immigrant or black and white, along several dimensions such as access to job, education and neighborhoods, among others. Recently, there is also a growing interest in the multigroup cases.

The purpose of this paper is to understand the life situation of aged people in Europe. Data come from three regular panel waves (wave1, wave2 and wave4) from the Survey of Health, Ageing and Retirement in Europe (SHARE). Focusing on the two-group case, women and men, we derive several segregation indices and provide segregation curves respect to two dimensions: employment and level of education. These curves allow us to derive a partial order for some Mediterranean countries; in particular, we focus on France, Greece, Italy, Portugal and Spain.

Further research will be conducted aiming at analyzing multigroup segregation, in particular investigating the intersection of race/ethnicity and gender and extending the results to all the European countries.

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