

Childlessness in later ages in Portugal and in Southern European Countries

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It is argued that parenthood is no longer a basic condition for achieving self-realization and that the choice of a life without children (*childfree*) has become increasingly common and free of stereotypes (Basten, 2009), transforming the desired and ideal family size in one of the most important determinants of future fertility. However, it is also necessary to recognize the importance of education level and employment status in the choice of a *childfree* life (Koropecj-cox & Pendel, 2007; Mendes *et al.*, 2015).

Moreover, the recent economic and social situation in some European countries effectively altered individual's fertility behaviour. Particularly, in Southern European countries, which were more battered by the economic crisis, there was a consolidation of a fertility postponement pattern with a strong concentration of births around age 30 (Sobotka, 2013; Mendes, 2012; Mendes *et al.*, 2015).

For the past decades, the number of individuals who end their reproductive lives without children has been increasing (Tanturri & Mencarini, 2008; Cunha, 2012; Mendes, 2012), which is, in large part, the result of the postponement of parenthood. Despite the apparent postponement of fertility projects, we know little about reproductive intentions of Southern Europeans after age 30 - age at which the decision to have a child may begin to be compromised by biological limits. Hence, we are particularly interested in analysing those individuals who have reached their 30's without children and we try to define the profile of those who are more likely to remain childless.

Data and methods

In this study, we resorted to the data from the Eurobarometer (2011) and from the Portuguese Fertility Survey (2013). Using data from the Eurobarometer we considered not only the sample from Portugal, but also Spain, Italy and Greece. Moreover, in both data we restricted the analysis to childless respondents aged between 30 and 54, resulting in a sample of 399 respondents from the Eurobarometer (68 from Portugal, 100 from Spain, 115 from Italy and 116 from Greece) and a sample of 1125 respondents from the Portuguese Fertility Survey.

In order to examine and quantify the effect of the characteristics that make the residents in the Southern European countries remain childless, we adjusted two logistic regression models. Logistic regression models have a wide applicability when adjusting a parsimonious model to describe the relationship between a dependent variable and a set of explanatory variables. However, what distinguishes a logistic regression model is that the response variable is dichotomy, as it is the case of the response variable of the analysis: 0, temporary childlessness; 1, permanent childlessness.

In this study we considered the covariates described in Table 1. However, we had to aggregate the categories of some of these variables due the reduced number of observations. Moreover, to adjust these models we used the R Project software (R Core Team, 2013) and the packages *surveys*, *rms*, *mfp*, *EPI* and *EPIR*, and followed the strategy set by Hosmer *et al.* (2013). The significance of the variables and interactions were tested by using the Wald Test. The model's quality of adjustment was evaluated with the goodness of fit test (Hosmer and Lemeshow Test) and the

discriminative capacity assessed by the AUC (Area Under the Curve) value of the ROC (Receiver Operating Characteristic) curve.

Table 1: Variables considered in the multivariate analysis.

Fertility Survey in Portugal (2013)	Eurobarometer (2011)
<i>Age</i>	<i>Age</i>
<i>Gender</i>	
Male	Male
Female	Female
<i>Country</i>	
Portugal	Portugal Spain Italy Greece
<i>Area of residence</i>	
Lower populated	Rural area or village
Medium populated	Small or medium city
Higher populated	Large city
<i>Partnership status</i>	
Married	Married
Partnered	Divorced or separated
No partner	Widower Single with partner Single without partner
<i>Education Level</i>	
Lower	Lower
Medium	Medium
Higher	Higher
<i>Employment status</i>	
Employed: works 36 or more hours	Employed
Employed: works up to 35 hours	Unemployed
Unemployed	
<i>Education level of father / mother</i>	
Lower	Lower
Medium	Medium
Higher	Higher
<i>Ideal number of children</i>	
Two	Two
More than two	More than two
Less than two	Less than two
<i>Income</i>	
Up to 500 €	-
501 € -1000 €	-
More than 1000 €	-
<i>Stepchildren</i>	
None	-
At least one	-
<i>Parents divorced</i>	
No	-
Yes	-
<i>Age when respondent left the household</i>	
Up to 25 years old	-
26-34 years old	-
More than 34 or hasn't left the household	-
<i>Quantity quality trade off ^{a)}</i>	
Agree	-
Disagree	-

Table 1: Continued.

<i>The conciliation between work and family is better if one:</i>	
Works partial time or from home	-
Works full time	-
Doesn't work	-
<i>A woman or man needs to have a child to feel fulfilled</i>	
Agree	-
Disagree	-
<i>In general, how do you feel about the life you have?</i>	
-	Satisfied
-	Not satisfied
-	Not at all satisfied
<i>Evaluation / Expectations about the:</i>	
-	<i>area of residence</i>
-	<i>health system in country</i>
-	<i>provision of pensions in country</i>
-	<i>unemployment benefits in country</i>
-	<i>cost of living in country</i>
-	<i>cross-cultural relations in country</i>
-	<i>way addressing poverty in country</i>
-	<i>affordability of housing in country</i>
-	<i>public administration in country</i>
-	<i>economic situation in country</i>
-	<i>personal job situation</i>
-	<i>economic situation in household</i>
-	<i>job situation in country</i>
-	Good / Bad (<i>Evaluation</i>)
-	Better / Same / Worse (<i>Expectations</i>)
<i>Difficulties paying the bills in the past year?</i>	
-	Never or rarely
-	Sometimes
-	Several times

^{a)}The *Quantity quality trade off* was measured with the question *Is it preferable to have only one child with more opportunities and less restrictions than having more children?*

Patterns in Southern European countries

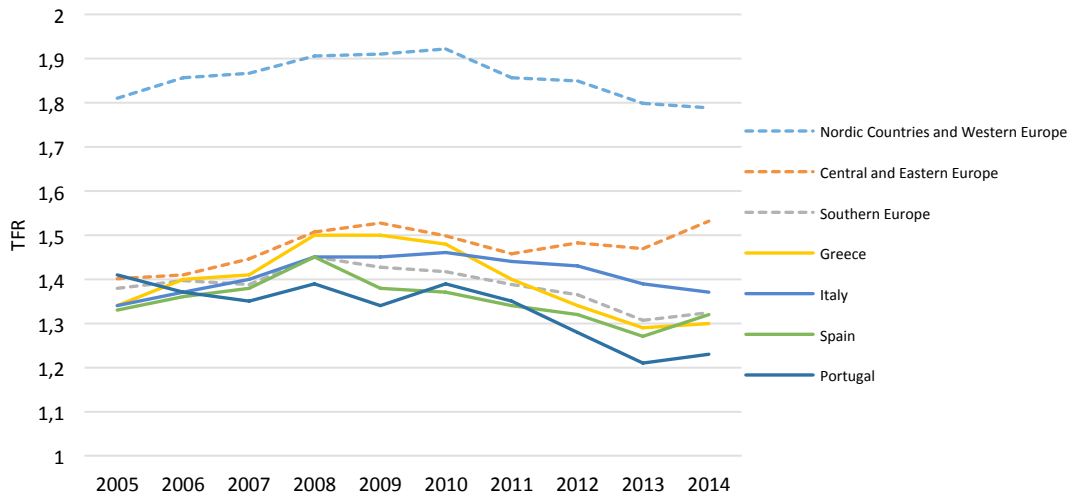
Although we are not interested in detailing the various features of the selected countries, we analyse a few fertility indicators to illustrate both similarities and differences between these four countries in the last 10 years. We are particularly interested in comparing indicators that can explain fertility levels in the selected countries, such as the total fertility rate (TFR) and the mean age of women at birth of first child. Moreover, we focus our analysis in the proportion of live births outside the marriage within the selected countries.

Low fertility is currently a major concern of some European countries, including the South. Portugal is no exception, since it has one of the lowest fertility rates in Europe and in the world. In 2014, the TFR was about 1.23. In the beginning of 1950, this level was about 3.1, but since then, this indicator has been decreasing. In 1982, it was already below the threshold of the generation's replacement (2.1 children per woman, at the current mortality conditions of the European countries) and for the first time in 1994, it reached 1.5 children per woman.

In 2005, Portugal had a higher TFR than Spain, Italy and Greece. However, in the last 10 years, while the latter countries practically maintained the same levels (between 1.30 and 1.37), Portugal registered a decrease, going from 1.41 in 2005 to 1.23 in 2014 (Figure 1). Still, these four countries clearly distinguish themselves from the Nordic Countries and Western Europe, which in the past 10 years have maintained

their TFR levels above 1.8.

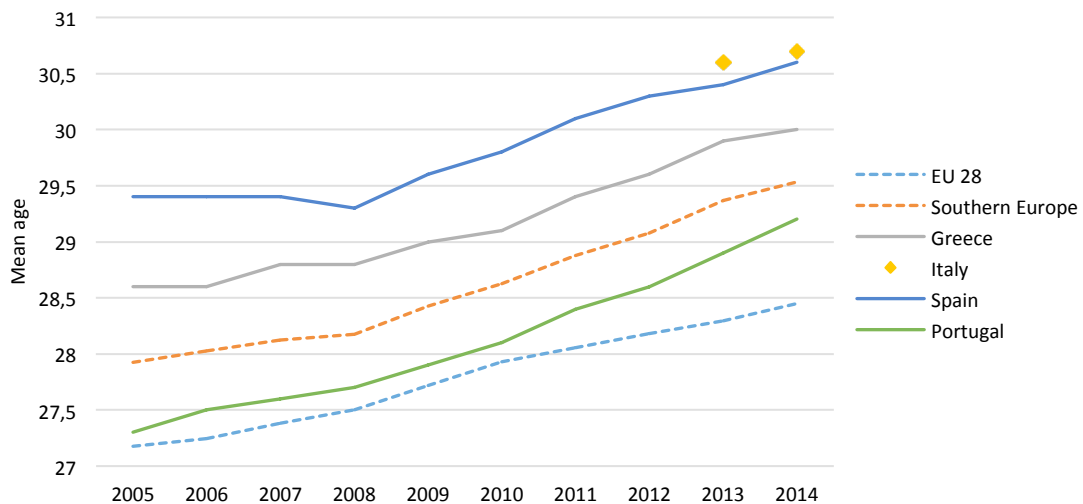
Figure 1: Total fertility rate by year and country.



In a way, the increasing number of women and men who have no children or that have been postponing parenthood has contributed to the low values of the observed fertility rates (Morgan, 1991; Sobotka, 2008). In fact, in recent years, postponing the birth of the first and therefore the second child has been a common behaviour among Portuguese (Cunha, 2012; Mendes, 2012). In 2014 the average age at which women had children was 30.7 years and the average age at which they had their first child was 29.2 years. The proximity between these ages suggests that Portuguese women tend to have only one child and later. In other southern European countries, a postponement of fertility projects has been increasingly common. In fact, according to 2014 Eurostat data, Greece women had their first child on average at age 30.0, in Spain at 30.6 and in Italy, the estimated value was 30.7.

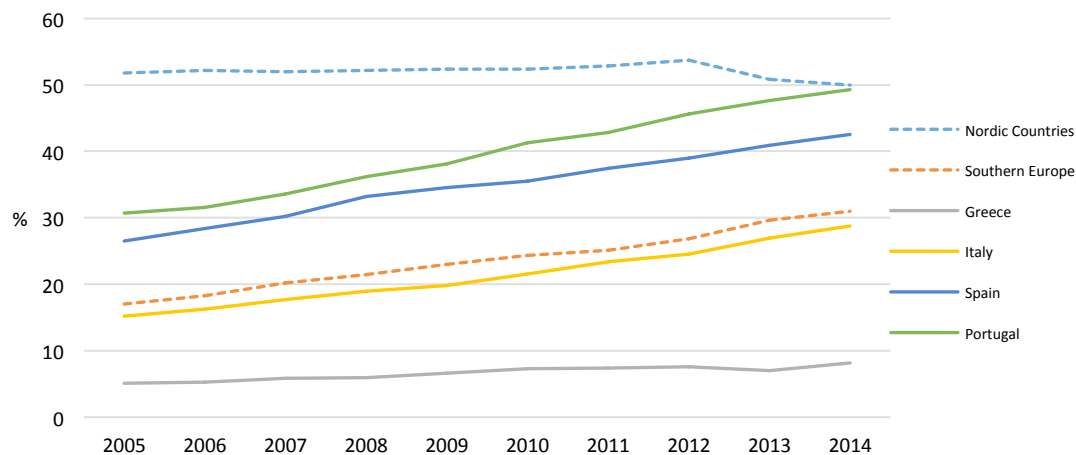
In Figure 2, we can see that woman's mean age at birth of first child has been increasing for the generality of European countries. However, all these four Southern European countries presented higher averages in the past 10 years, especially Italy and Spain. Despite this postponement, Portuguese women have had their first child, on average, earlier than Italian, Spanish or Greek women do.

Figure 2: Female mean age at birth of first child by year and country.



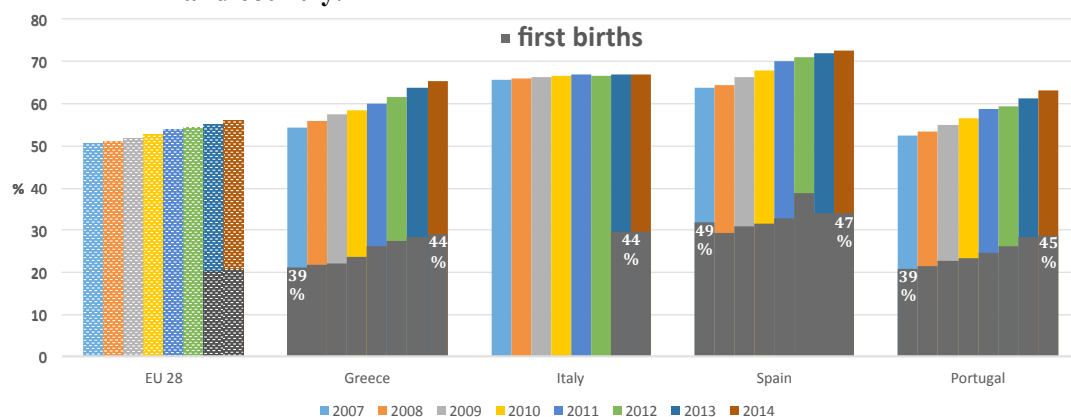
The proportion of live births outside marriage has also been increasing in most Southern European countries. However, Greece and Italy register lower shares than Portugal and Spain. In 2005, 30% of live births in Portugal occurred outside the marriage, but in 10 years, this proportion quickly increased by 20% (Figure 3). This means that in 2014, almost half of the births happened outside the marriage. Hence, in the latest years Portugal reached the levels of Nordic countries that are traditionally characterized by having the highest shares of births outside the marriage in Europe.

Figure 3: Proportion of live births outside the marriage by year and country.



Considering the consolidation of a fertility postponement pattern with a concentration of births around age 30 and the distinctive feature of the increasing number of people that have on average one child, in Figure 4 we look at the share of live births and first order live births after age 29. If the share of live births outside the marriage maintained its low levels in Greece (lower than 10%, Figure 3), this does not happen when considering the share of live births after age 30. Except for Italy, it seems that the number of births after age 30 has been gradually increasing in the past 10 years. For these Southern European countries, since 2005, at least half of the births occurred after age 30 and most of them were due to the second or higher birth orders. However, the first order births have also been increasing, reaching shares of about 45% in 2014.

Figure 4: Proportion of live births and first order live births after age 30, by year and country.



Childlessness in Southern Europe

To find the determinants of childlessness after age 30 in Southern European countries in 2011, we adjusted a logistic regression model considering the response variable: 0, temporary childlessness (64%); 1, permanent childlessness (36%). In the latter category, we considered those who have no children and intend to remain without them and for temporary childlessness we considered those who despite having no children, demonstrated an intention to still have at least one.

According to the adjusted model (Table 2), after age 29, for each additional year, the chances of remaining childless increases 24%. These figures demonstrate the implications of a delay in entering parenthood and that the non-recovery of a previous postponement can be devastating not only on the number of births, but also in the ultimate fertility of the different generations.

Portuguese, Spanish and Italians are more likely to remain childless relative to Greeks, which means that not all Southern European countries that are characterized by a low fertility pattern present the same behaviours. Often we consider that countries that went through the recent crisis and recession have the same fertility behaviours. However, when it comes to remaining without children Greece clearly distinguishes itself from the remaining countries.

We also conclude that individuals who live in large cities are more likely to remain childless, as well as those with a medium education level (relatively to those with higher education) and that have no partner. The ideal number of children is also determinant to explain the decision to enter parenthood, since that those who have lower ideals (less than two) are more likely to remain childless. This result shows that having a greater or lower ideal is still determinant to explain the fertility decision-making process.

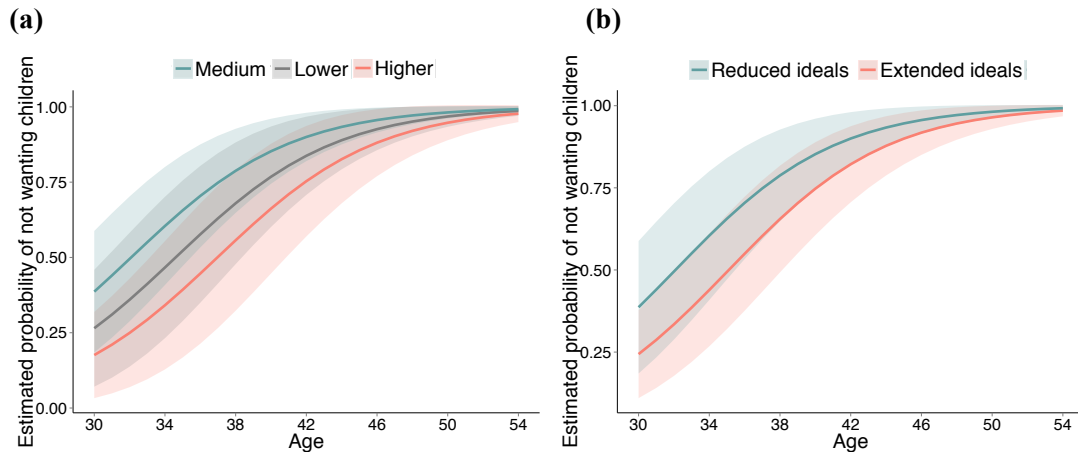
Table 2: Beta estimates ($\hat{\beta}$) of the logistic regression model – *permanent childlessness vs. temporary childlessness* (Southern Europe), standard deviation estimates ($\hat{\sigma}_{\hat{\beta}}$) and p value of Wald Test. ($R^2 = 0.47$; AUC = 0.87; p value of Hosmer Test = 0.97)

Covariate	$\hat{\beta}$	$\hat{\sigma}_{\hat{\beta}}$	p value
Age	0.22	0.02	<0.001
Country (ref. Portugal, Spain or Italy)			
Greece	-1.10	0.51	0.03
Area of residence (ref. Rural area or village / small or medium city)			
Large city	0.89	0.33	0.01
Education level (ref. Medium)			
Lower	-0.56	0.35	0.11
Higher	-1.08	0.39	0.01
Partnership status (ref. Married / partnered / divorced / separated / widower)			
Single without partner	0.77	0.30	0.01
Ideal number of children (ref. 2 or more)			
Less than 2	0.67	0.31	0.03

Considering the profile with high probability of remaining childless after age 29, we now focus the analysis on those who live in Portugal, Spain or Italy and in large cities, have a medium education level, are single and consider that the ideal number of children for a family is less than two. For this profile, in Figures 5 (blue lines) we look at the predicted probabilities of remaining without children, withdrawn from the logistic regression model in Table 2, considering respondents aged 30-54. Moreover, in Figure 5a we compare the effect of education level and in Figure 5b the effect of the ideal number of children. We conclude that the probabilities of remaining

childless increases with age, whatever the education level or ideals. For the different scenarios, after age 46 the probabilities of not having a child are higher than 0.8. However, these probabilities are not as high for those with a lower or higher education level and for those who have wider ideals.

Figure 5: Estimated probabilities of not wanting children after age 29 in southern European countries, by age, education level (a) and ideal number of children (b). The shaded areas represent the respective confidence intervals at a 95% confidence level.



Childlessness in Portugal

Using the data from the Portuguese Fertility Survey (2013), we analyse the proportion of woman who have no children and intend to remain childless, by age, education level (Figure 6) and ideal number of children (Figure 7). We focus the analysis in three groups of cohorts: 1964-1968, in which we consider woman who ended their reproductive lives; 1969-1983; and 1984-1995.

For woman who ended their reproductive lives, the proportion of childlessness increases with education, reaching almost 18% for those who have a higher level (Figure 6). Voluntary childlessness, however, is not as high among younger woman with higher education. Nevertheless, the proportion of childless woman who do not intend to have children reaches 10% among those aged 30-44 and 8% among 18-20. This scenario changes for women with lower education levels, since the share of voluntary childlessness is higher for those who are younger: 6.2% for women aged 18-20 and 5.6% for women aged 30-44.

The share of childlessness woman decreases with the ideal number of children, going from low ideals (less than 2) into higher ones (more than 2). Proximally 20% of women with lower ideals ended their reproductive lives with no children, while this share was only 12% for women with higher ideals. In Figure 7, looking at woman with lower ideals, we have to highlight that the share of voluntary childless is already higher for younger generations than for women who ended their reproductive lives, reaching almost 30% among those who have not reached their 30s.

Figure 6: Share of childlessness among woman by education level and age.

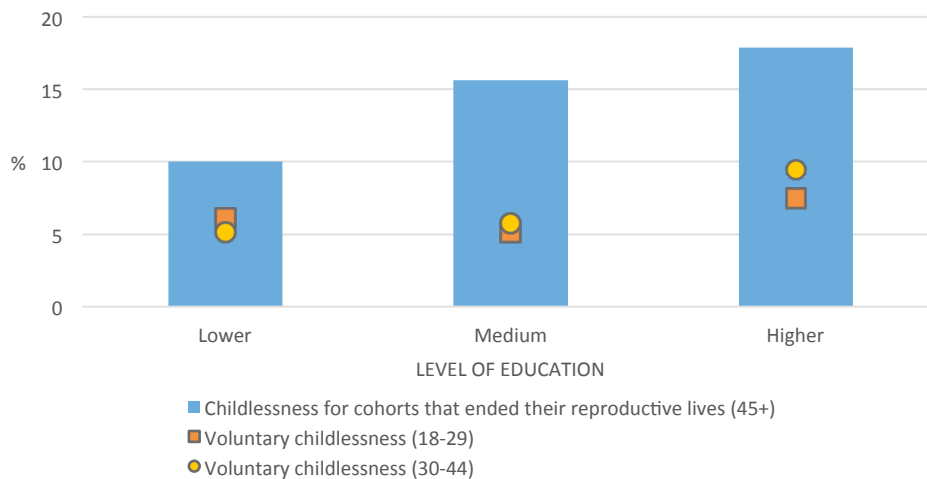
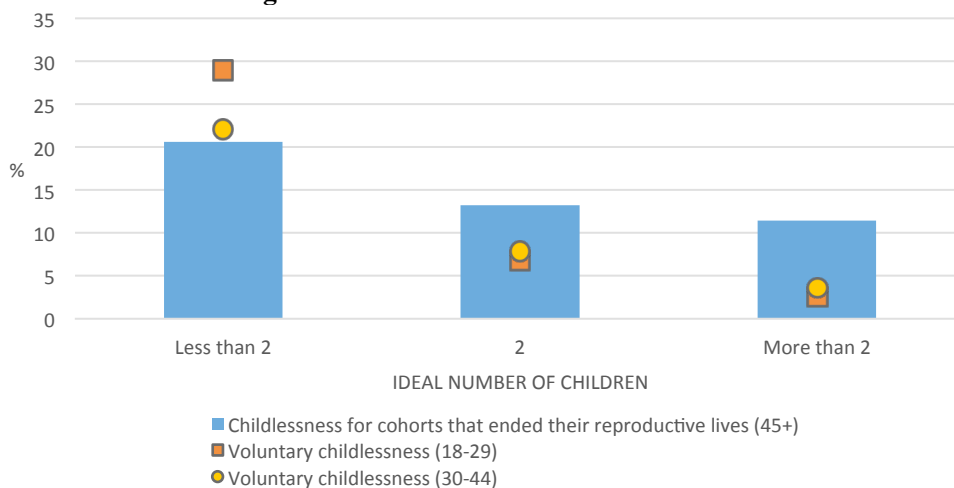


Figure 7: Share of childlessness among woman by the ideal number of children and age.



To find the determinants of childlessness after age 30 in Portugal in 2013, we also adjusted a logistic regression model considering the response variable: 0, temporary childlessness (56%); 1, permanent childlessness (44%). From the adjusted model presented in Table 3, we conclude that after age 29, for each additional year, the chances of Portuguese remaining childless increases 31%, which is higher than the chances found with the southern European model (27%). Women who do not have a partner are also more likely to remain without children. Moreover, wanting to remain without children is negatively correlated with higher ideals and positively associated with lower ideals, lower education levels, unemployment and with a disagreement about the need to have a child in order to achieve self-realization.

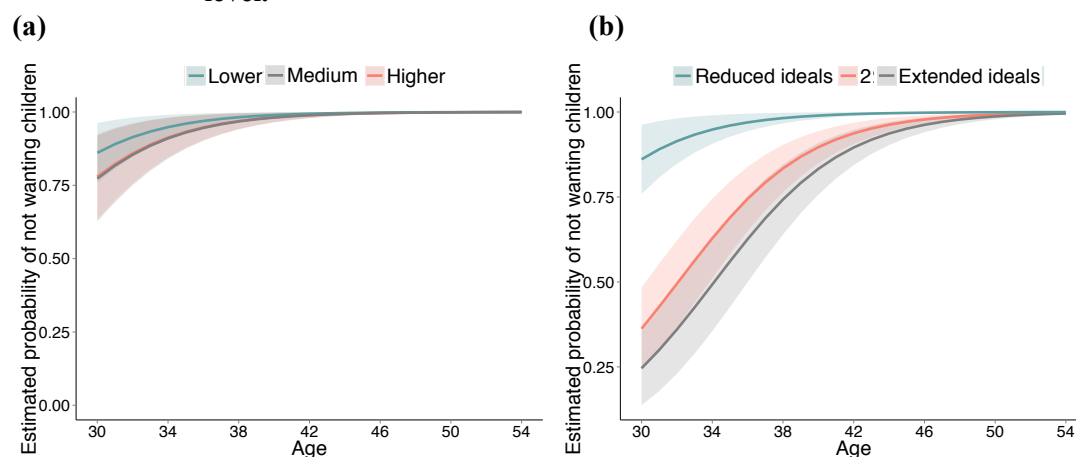
In Figures 8, we now focus on the profile with high probability of remaining childless after age 29 in Portugal. We look at Portuguese woman who do not have a partner, are unemployed, have a lower education level and consider that the ideal number of children for a family is less than two and perceive that a woman or man does not need to have a child to feel fulfilled. For this profile, in Figures 8 (blue lines) we look at the predicted probabilities of remaining without children, considering respondents aged 30-54. Also for Portugal, in Figure 8a we compare the effect of education level and in Figure 8b the effect of the ideal number of children. With this, we find that the probabilities of remaining childless increases with age, being higher

than 0.9 after age 32. However, these probabilities decrease for those with higher education levels and it is significantly lower for those with higher ideals. For example, at age 30, a Portuguese woman who fits in the profile mentioned above has a probability of remaining without children of 0.86. However, if her ideal number of children is two, this probability decreases to 0.36, and is even lower if she has higher ideals (0.25).

Table 3: Beta estimates ($\hat{\beta}$) of the logistic regression model – *permanent childlessness vs. temporary childlessness* (Portugal), standard deviation estimates ($\hat{\sigma}_{\hat{\beta}}$) and p value of Wald Test. ($R^2 = 0.59$; AUC = 0.88; p value of Hosmer Test = 0.52)

Covariate	$\hat{\beta}$	$\hat{\sigma}_{\hat{\beta}}$	p value
Age	0.27	0.02	< 0.001
Gender (ref. Male)			
Female	-0.05	0.26	0.86
Partnership status (ref. Married or partnered)			
Single without partner	-0.45	0.22	0.04
Education level (ref. Medium)			
Lower	0.60	0.21	0.01
Higher	0.04	0.21	0.86
Employment status (ref. Employed)			
Unemployed	0.79	0.19	< 0.001
Ideal number of children (ref. Two)			
Less than 2	2.38	0.37	< 0.001
More than 2	-0.55	0.19	0.003
A woman or man needs to have a child to feel fulfilled (ref. Agree)			
Disagree	0.60	0.17	< 0.001
Gender (Female) * PS (Single without partner)	1.64	0.33	< 0.001

Figure 8: Estimated probabilities of not wanting children after age 29 in Portugal, by age, education level (a) and ideal number of children (b). The shaded areas represent the respective confidence intervals at a 95% confidence level.



Conclusions and remarks

An age increase, a lack of a suitable partner and a low ideal family size are the most important determinants in the decision of remaining childless. Additionally, we find that those who live in large cities are also more likely to not experience parenthood. Because individuals with lower education levels tend to make earlier transitions to parenthood, when they reach the age of 30 without children they become more likely to remain childless. At the country level, the Greeks have lower

chances of remaining without children relatively to the Portuguese, Spanish and Italians, showing that not all Southern European countries present the same fertility behaviour when the decision-making is related to a life without children.

We also highlight the fact that Portuguese who think that parenthood is not a basic condition for achieving self-realization and that have lower ideal standards for a family size are more likely to choose a childfree life. The Portuguese results show that, after age 30, the decision to remain without children is not only related with life circumstances but also with personal values.

References

- Basten, S., (2009). *Voluntary childlessness and being childfree. The Future of Human Reproduction.* Working paper, No. 5. https://www.spi.ox.ac.uk/fileadmin/documents/PDF/Childlessness_Number_5.pdf
- Cunha, V., (2012). Trajetórias não reprodutivas em três gerações de portugueses: incidência, circunstâncias, oportunidade. In *Atas VII Congresso Português de Sociologia: Sociedade, Crise e Reconfigurações. Porto*, 1-11.
- Hosmer D., Lemeshow, May, S. (2013). *Applied Logistic Regression*, 3rd Ed. New York, EUA: Wiley.
- Koropecj-Cox, T.; Pendel, G., (2007). The gender gap in attitudes about childlessness in the United States. *Journal of Marriage and Family*, 69(4): 889-915.
- Mendes, M. F. (2012). Declínio da fecundidade, adiamento e número ideal de filhos em Portugal: o papel das medidas de política. In *Roteiros do Futuro - Conferência "Nascer em Portugal"*. Lisboa: Oficinas Gráficas da Imprensa Nacional – Casa da Moeda, p. 91-109.
- Mendes, F.; Infante, P.; Afonso, A.; Maciel, A.; Ribeiro, F.; Tomé, L.; Freitas, R. (2015). *Fertility Determinants in Portugal*. Francisco Manuel dos Santos Institute. In: <https://www.ffms.pt/publicacoes/detalhe/1492/determinantes-da-fecundidade-em-portugal>.
- Sobotka, T. (2013) *Pathway to low fertility: European perspectives.* (Expert Paper 2013/8). New York: Population Division, Department of Economic and Social Affairs, United Nations.
- Tanturri, M. L.; Mencarini, L., (2008). Childless or childfree? Paths to voluntary childlessness in Italy. *Population and development review*, 34(1): 51-77.