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ORIGINAL ARTICLE

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Do I want more if you help me? The impact of grandparental involvement on men's and women's fertility intentions

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Abstract

Grandparental support is positively associated with women's labor force participation and fertility transitions. Specifically, grandparental support shapes adult child's entry into parenthood by influencing adult child's expectations about future care. In this framework, the current study investigates whether observed grandparental support impacts adult sons' and adult daughters' fertility intentions in a lowest-low fertility country such as Spain. We use data from the new wave of the Spanish Fertility Survey (2018), and we find that receiving grandparental support has a positive and significant impact on women's but not on men's fertility intentions. Furthermore, this impact remains positive after controlling for women's socio-economic characteristics. Finally, education results the main mediator for the relationship between grandparental support and women's fertility intentions, with highly educated women displaying a significantly increase of their fertility intentions compared to their low-educated counterparts. Our findings highlight gender differences in the perceived role of grandparental support for future fertility, and the importance of informal care for balancing family and work in the Spanish context.

Keywords: Grandparental support, Gender, Fertility intentions, Childcare, Spain

Introduction

In the last four decades, institutions initially failed to adapt to women's new role leading to a general decline in fertility levels across advanced societies (McDonald, 2000). Although some countries recovered this initial decline, others experienced a continuous fall in fertility levels reaching the so called lowest-low fertility (Billari & Kohler, 2004). Unsupportive welfare state, and specifically weak family policies, has been identified as one of the most important factors for such a trend (Esping-Andersen, 2009). Weak family policy and unsupportive welfare state translate into a structural incompatibility between motherhood and career development which, at micro-level leads to either delayed or forgo fertility transitions (Goldscheider et al., 2015).

External childcare provision represents an important channel to soften women's family-work conflicts (e.g., Baizan, 2009; Del Boca 2002). Due to the increasing aging population, grandparents have received a growing attention in the fertility literature because

their support represents a valuable resource for reconciliation strategies. Specifically, according to recent European evidence, grandparental childcare provision increases women's chances to have another child (e.g., Aassve, Arpino, et al., 2012; Aassve, Meroni, et al., 2012) and, in case would-be grandparents are perceived as supportive, the adult children have higher chances to enter into parenthood (Rutigliano, 2020).

Whereas an extensive literature has focused on the impact of grandparental support on fertility behaviors (e.g., Aassve, Arpino, et al., 2012; Aassve, Meroni, et al., 2012; Liefbroer, 2005; Rutigliano, 2020; Schaffnit & Sear, 2017), little is known about the association between grandparental support and fertility intentions (but see Tanskanen & Danielsbacka, 2021; Tanskanen & Rotkirch, 2014 for an exception). However, according to the theory of planned behaviors (TPB from now onwards) (Ajzen, 1991), certain decisions might be strongly predicted by their intentions as individuals' intentions embed the perceived costs and benefits attached to a specific behavior. Therefore, investigating the determinants of intentions represents an important step to better understand the determinants of behaviors.

The current study focuses on both men's and women's fertility intentions because perceived cost of children, as well as the perception of having children, might be different across genders. Within the household, although men are becoming more and more involved, women, especially after childbirth, are still performing the majority of housework and childcare activities (Nomaguchi & Milkie, 2020). Furthermore, after the birth of the child, mothers tend to be penalized in the labor market, whereas men tend to be rewarded (Gangl & Ziefle, 2015; Glauber, 2018). Thus, men and women can differently anticipate costs and rewards of parenthood (Liefbroer, 2005).

The current article focuses on the Spanish context which offers a unique case study to investigate the relationship between grandparental childcare and fertility intentions. Spain is, characterized by a late entry into motherhood and weak public policies (Esping-Andersen, Arpino, et al., 2013; Esping-Andersen, Boertien, et al., 2013). Families experience great difficulties in balancing work and family life (Gracia & Kalmijn, 2016), and although family ties are strong, grandparental care is provided at high-intensity levels but with a low prevalence among the population (Hank & Buber, 2009). Furthermore, in the last two decades, although Spanish fertility rates have been among the lowest in Europe (Esteve et al., 2021), Spanish desired fertility has been stable around the value of two children per woman (Adsera, 2006, Adsera and Lozano 2021). Compared with the decision of becoming parents, having a second child is a more rational and less emotional choice (Morgan, 2003). For this reason, transition to second child is more likely to be postponed or forgone if people experience work–family conflicts (Mills et al., 2011).

Applying the TPB to fertility dynamics, we investigate the association between receiving grandparental support and the intention to have a second or higher-parity child in the near future, for both men and women. The current article adds to the literature about the role of grandparents on the adult child's fertility in three ways. First, we contribute to study the association between observed grandparental care and fertility intentions. Second, we expand our focus to men's fertility, and we assess whether grandparental support has a different impact on women compared to men. Third, we focus on the Spanish case on which, due to data limitations, there are fewer studies, even though it is a relevant context for this type of research.

Background

Fertility and fertility intentions

According to the Theory of Planned Behaviors (Ajzen, 1991; Ajzen & Fishbein, 2005) (TPB), individuals' intentions are strictly linked with individuals' behaviors. Furthermore, individuals' intentions account for their perceived costs and benefits of that behavior. An extensive literature has applied the TPB to fertility dynamics and, specifically, to fertility intentions (e.g., Billari et al., 2009; Morgan, 1985; Schoen et al., 1999; Testa & Basten, 2014). The main hypothesis that links these two concepts is that in those societies in which contraceptive use is spread out, it is reasonable to assume that individuals plan or intent their childbirth (maybe not always their pregnancies). Therefore, studying fertility intentions—through the lens of the TPB—allows researchers to better understand whether people want to have children and why, i.e., what are those costs that sometimes prevent them from having children despite their desires.

The first relevant question about fertility intentions is whether they represent a reliable measure for behaviors. Previous research has highlighted a set of conditions under which intentions result a reliable measure for behaviors. Specifically, it is important to frame intentions in a specific time-period, in fact the longest the intentions remain not achieved, the higher the likelihood they will never become a behavior (Billari et al., 2009; Philipov, 2009). Thus, intentions have to be asked within a specific and sufficiently short time horizon (Philipov, 2009; Schoen et al., 1999; Testa & Basten, 2014). Furthermore, fertility intentions are parity-specific, i.e., the intention to have a first child entails a different decisional process than the intention to have second or higher parity (Morgan, 1982). Finally, another important aspect to consider is that although intentions are measured at individual-level, the decision to have a child is often made at couple-level. Therefore, a non-agreement within the couple might lead to unrealized or delayed fertility decision despite fertility intention (Billari et al., 2009; Morgan, 1985).

Following the TPB, intentions already include the perceived costs and benefits of the subsequent action. Hence, all those factors influencing both fertility intentions and fertility transitions are essential to understand how the decision process works (Mencarini et al., 2015). Previous studies find that individuals' demographic and socio-economic characteristics have an important impact on both intentions and realizations. Women's age and their number of children are two of the most important demographic factors (Bühler & Philipov, 2005; Mencarini et al., 2015) with younger mothers displaying a higher likelihood of intending to have another child (Philipov et al., 2006). Furthermore, the number of children and the age of the youngest child are negatively correlated with the intention to have another child (Balbo & Mills, 2011; Bühler, 2008).

Education, income, and employment status also play an important role in shaping fertility intentions and fertility transitions. Specifically, high-educated women are more likely than low-educated ones to report the intention to have another child (Balbo & Mills, 2011; Esteve et al., 2021; Philipov et al., 2006). Furthermore, high-educated women better anticipate fertility intentions than their low-educated counterpart (Toulemon and Testa 2005). Similarly, high-income household are more likely of intending another child (Philipov et al., 2006; Tanskanen & Rotkirch, 2014). Finally, individuals who are studying or who are not employed have a significant

lower risk of having another child in the next 2 years compared to those who are employed by the government or by a private firm (Philipov et al., 2006).

Although few studies have investigated the direct role of grandparental support on fertility intentions, there is a wider set of studies that investigate the role of support defined as general additional help and social support. The high involvement of partner in the household chores, the use of paternity leave, and co-residing with grandparents or in-laws positively affect Korean women's intentions to have a second child (Yoon, 2017). In line with these findings, a study on Italy, a *familialistic* country, shows that partner's involvement in childcare, household chores, and the take up of paternity leave, positively impact women's fertility intentions (Fiori, 2011). Finally, in Italy, childcare provided by the external family network positively and significantly raises women's intention to have another child (Fiori, 2011). Due to the similarities between the Spanish and the Italian context, we might expect grandparental informal support to play a similar role in Spain as well.

Grandparental support, fertility and fertility intentions

Grandparental childcare provision represents a resourceful boost for the adult child's fertility transitions as it helps couples and especially women to soften work–family conflicts (Aassve, Arpino, et al., 2012; Kaptijn et al., 2010; Thomese & Liefbroer, 2013). In fact, receiving grandparental childcare improves women's labor force participation (Aassve, Arpino, et al., 2012), and first and higher-parity fertility transition (Aassve, Meroni, et al., 2012; Kaptijn et al., 2010; Thomese & Liefbroer, 2013). Furthermore, in countries with unsupportive welfare state and weaker family policies, grandparental childcare plays a more relevant role in shaping adult children entry into parenthood (Rutigliano, 2020).

The role of grandparental childcare on fertility intentions has received little attention and it has produced mixed findings. A recent study about Germany does not find any significant association between parental investments—defined as number of contacts, financial and emotional support—and adult sons 'and adult daughters' intention to have a first and a second child (Tanskanen & Danielsbacka, 2021). On the other hand, grandparental childcare has found to have a positive and significant impact on women's fertility intention in both Norway and France (Tanskanen & Rotkirch, 2014). Furthermore, grandparental emotional support increases women's fertility intention but only for relatively wealthy households (Tanskanen & Rotkirch, 2014).

A possible reason for these mixed findings could be the heterogeneity in the grandparental investment measures. In contrast with the second study (Tanskanen & Rotkirch, 2014), in the first study (Tanskanen & Danielsbacka, 2021) parental investments are measured with variables that are not directly related with childcare provision which, in turn, is found to be one of the most important resources lowering the cost of children (Bühler, 2008). A second possible explanation lies in the heterogeneity of national contexts. Family norms, gender division of unpaid work, and the type of welfare state influence each other leading to different perceptions of informal childcare provision (Jappens & Van Bavel, 2012).

Gender differences in the perceived and actual cost of children

In the current study, we explore the relationship between grandparental support and fertility intentions by gender. Women and men could have different perceptions about the consequences of having another child (Bühler, 2008; Liefbroer, 2005). Such differences might depend on the gendered dynamics on the labor market and on the gender roles within the household when it comes to parenthood.

Existing literature reports a consistent motherhood wage-penalty, in contrast to a father wage-reward (Anderson et al., 2003; Avellar & Smock, 2003; Budig & Hodges, 2010; Glauber, 2018; Killewald & Gough, 2013). In addition, there are multiple stereotypes in play. Previous studies find that employers associate positive ideas with working fathers, such as job commitment, but negative ideas with working mothers, such as absenteeism and lower productivity (González et al., 2019). Furthermore, within the household, although men are becoming more and more involved, women, especially after childbirth, are still performing the majority of housework and child-care activities (Nomaguchi & Milkie, 2020). These evidences lead men and women to perceive childbirth differently. Women identify as a future cost of motherhood a loss in their independence and a drop in their career trajectory and independence, whereas men expect an enhancement in their partnership quality (Liefbroer, 2005).

All in all, these findings suggest that perceived and actual costs of parenthood might be higher for women than for men.

The Spanish case

Spain, compared to other countries, represents an interesting case study as grandparental support might be particularly relevant for boosting fertility intentions. First, Spain displays one of the lowest fertility rates in Europe (1.3 children per woman in 2020) and among the highest mean-ages at entry into motherhood (31.2 years old in 2018—EUROSTAT). Nonetheless, on average, women desired fertility has been stable around the value of 2 children per woman (Adsera, 2006; Esteve et al., 2021). Hence, there is a growing gap between desired and realized fertility also called *fertility gap* (Esping-Andersen, Arpino, et al., 2013; Esping-Andersen, Boertien, et al., 2013). At the micro-level, the Spanish fertility gap indicates that women, both in their private and public lives, do not meet the proper conditions to have the children they desire at the time they desire. Consequently, they delay and eventually forgo their second birth transition (Brodmann et al., 2007; Esteve et al., 2021).

Several factors have been identified to explain such a trend. First, the Spanish labor market is characterized by temporary contracts and a high levels of insecurity (Lozano Renteria 2019; Verd et al., 2019) which is negatively correlated with fertility intentions and childbirth (Comolli, 2017). Women in Spain face a large motherhood penalty that negatively affects mother's earning and their career, promotion, and aspiration development (Budig & Hodges, 2010; de Quinto et al. 2021). Indeed, research shows that ten years after childbirth, a persistent gender-gap in terms of wages and promotions largely attributable to motherhood is still observable (de Quinto et al., 2021). Furthermore, women in Spain are still the main caregivers and primarily responsible for unpaid work, which represents an extra obstacle for working mothers'

reconciliation strategies (Esping-Andersen, 2009; Garcia Roman & Cortina, 2016; Sevilla-Sanz, 2010).

Second, Spain is considered a *familialistic* country, i.e., the family is considered the main responsible for individual's well-being (Esping-Andersen, 2009). Given that childcare preferences and family policies are the result of the interplay between cultural values, family models, and public policies (Pfau-Effinger, 2005), a familialistic context might not favor the development of fully supportive family and childcare policies. The availability of formal childcare services in Spain has a positive impact on women's fertility transitions, however, there is shortage of public early-childcare (Baizan, 2009; Suárez, 2013), and private early-childcare is fairly expensive (Brodmann et al., 2007). Additionally, Spanish long working hours jointly with the low share of companies offering parents flexible schedules, might exacerbate parents' work-family conflicts (Adserà and Lozano 2021; Gracia & Kalmijn, 2016; Gutiérrez-Domènech, 2010). As a result, grandparents in Spain play a crucial role as they add flexibility to a rigid public childcare system (Baizan, 2016; Fernandez-Cordón and Tobío-Soler 2005; León & Pavolini, 2014).

These mechanisms affect not only more disadvantaged women, but also women with high education (Acosta-Ballesteros et al., 2018). In fact, women's improved levels of education are not being translated into either better occupational positions with higher wages, or into more egalitarian division of unpaid works within the household (García-Román, 2021). This leads to two possible scenarios for high-educated women. On the one hand, high-educated women tend to postpone motherhood as much as they can, which leads to a less likely transition to first and second birth (Brodmann et al., 2007). On the other hand, given that education is also correlated with higher income and more stable employment, high-educated women, after entering into motherhood, can squeeze the time-space between the first- and second-birth showing a higher likelihood to have a second child (Baizan, 2009; Esping-Andersen, Arpino, et al., 2013; Esping-Andersen, Boertien, et al., 2013).

Research questions and hypotheses

We address two main research questions:

1. Does current grandparental support influence fertility intentions, and is this relationship gender-specific? In other words, are women more responsive than men to grandparent-provided help when it comes to fertility intentions?
2. Is the relationship between grandparental support and fertility intention mediated by socio-economic characteristics and the number of children?

We formulate some hypotheses about the relationship between grandparental support and fertility intentions across the three dimensions of gender, socio-economic characteristics and number of parities.

H1: Gender unequal division of childcare and housework in Spain may lead to gender differences in anticipating the cost of childbearing. Mothers in Spain are not only penalized in the labor market (De Quinto et al. 2021), but also within the household,

even in dual-earner couples (García-Roman 2021). Consequently, Spanish women might be more responsive than men to grandparental support. *Hence, we expect women's fertility intentions to be more responsive than men's in receiving grandparental support.*

H2: Women who are more penalized by work–family conflicts are high-educated women as they are most likely to postpone or forgo entry into parenthood (Cooke, 2009). Thus, they are also those who benefit more from external sources of childcare (Brodmann et al., 2007). *Hence, we expect high-educated women's fertility intentions to be more responsive than their low-educated counterpart to receiving grandparental support.*

H3: In a lowest-low fertility context transition to second birth is crucial for future completed fertility. Furthermore, given that the desired family size is approximately two children per woman, fertility intentions after the second child might generally decrease. *Hence, we expect grandparental support not to influence women's fertility intentions of having a third or a higher parity.*

Data and methods

Data

We use data from the last wave of the Spanish Fertility Survey (SFS) -2018-. This is a cross-sectional survey that includes information for 14,556 women and 2,619 men aged 18 to 55. There are information about their family structure, relationships, children and labor market participation. This dataset represents the most recent, and to some extents, the sole source of data for studying fertility dynamics in Spain since the previous one dates back to 1999. As grandparental childcare provision can only be observed after the birth of the first child, we select only those individuals who already had one biological¹ child at the time of the survey. Furthermore, we drop all those individuals older than 46 years as their fertility plans might be almost at their end. Our final sample comprises 640 men and 4167 women. The number of women is consistently higher than that of men because of the initial sampling strategy. Finally, we use weights in all our models to correct the representativeness of some variables, as suggested in the survey guidelines.²

Our dependent variable indicates intentions of mothers and fathers of having another child in the upcoming three years. The original question is: “Do you intend to have another child during the next three years?”. We choose this question following previous findings indicating that questions about fertility intentions with a short and specific time-frame better predict future behaviors (e.g., Schoen et al., 1999). In our sample, on average 20% of respondents (i.e., $N=966$ out of which 135 men and 831 women) intend to have another child. Additional file 1: Table S1 shows the detailed descriptive for the dependent variable. Furthermore, among those who desire another child, on average, the 77% (69% of men and 78% of women) intends to have a second child, and the 23% (30% of men and 21% of women) intends to have a third or higher parity.

¹ We included only biological children, and excluded adoptions, because those individuals who adopt have stronger preferences to be parents.

² Available at [https://www.ine.es/dyngs/INEbase/en/operacion.htm?c=Estadistica_C&cid=1254736177006&menu=metodologia&idp=1254735573002].

Measures for grandparental childcare provisions

The main explanatory variable is grandparental support received for the current child. Specifically, the SFS questionnaire asks respondents with cohabiting children younger than 14 years old, and with non-cohabiting grandparents: “How many days per week do you use this type of help to look after your child? If you do not use them, write 0”. The answer includes grandparents, babysitters, kindergarten, private activities, other relatives and a residual category for other types of childcare. Due to data limitations, we cannot identify either whether childcare is provided by grandmothers or grandfathers, or whether it is the maternal, paternal, or both lineages of grandparents who provide support. Furthermore, although we know whether (grand)parents co-reside with their adult child, we do not have any further information on the characteristics of the co-resident grandparents. The question about grandparental care provision is asked only to adult children with no co-resident (grand)parents.

We create two main explanatory variables about grandparental childcare support. First, we build a categorical variable coded zero if respondents report not having received any grandparental support, one if they use any grandparental help, and two if living grandparents are co-residing with the main respondent. Second, we create another variable to account for the intensity of grandparental support. It distinguishes between week-grandparental support (i.e., from 1 to 5 days-per week), all-week support (i.e., 7 days per week), no support and co-resident grandparents. Table 1 shows complete descriptive statistics for these variables.

Other important explanatory variables

Our main interest is to study the association between fertility intentions and grandparental support and explore whether this association is different by gender, socio-economic status and parity. Thus, we control for other socio-economic characteristics, namely age, education, income, employment, and partnership status beyond gender. Socio-economic position can be proxied via different variables which grasp different dimensions. In our case, the level of education, household income, and employment status. Specifically, level of education in the original data is coded with three categories: primary, secondary, and tertiary or higher level of education. Due to reduced sample size, we recode it into two categories: “secondary level or lower” and “tertiary level or higher”³

Employment status in the original data is coded according to respondents’ job contract at the time of the survey. Possible answers are “temporary contract”, “employed without contract”, and “permanent contract”. Combining this variable with a dummy about employment status, we create a new variable which has four categories, the three aforementioned and the “non-working” one. For the purpose of this article, and considering the variables’ distribution, we use a dummy variable in our models, distinguishing only those who are working from those who are not. Individuals who were working but without a contract, i.e., within the informal economy, were very few (approximately 0.04% of the sample, i.e., 20 obs), furthermore they do not have any rights for maternity/paternity leaves, therefore, we consider them as “non-working”.

³ There are two main reasons for this recoding. First, the relatively small sample size of the category for primary education. Second, higher educated women are more likely to be employed and experience work–family conflict.

Table 1 Descriptive statistics for the main explanatory variables in the data

	Total		Men		Women	
	Mean/Prop	Freq	Mean/Prop	Freq	Mean/Prop	Freq
Grandparental support						
No grandparental support	0.50	2425	0.50	323	0.50	2102
Grandparental support- no resident grandparents	0.45	2149	0.47	301	0.44	1848
Co-resident grandparents	0.05	233	0.03	16	0.05	217
Intensity grandparental support						
No grandparental support	0.50	2425	0.50	323	0.51	2102
Week-day grandparental support	0.41	1996	0.44	285	0.41	1711
All week grandparental support	0.03	153	0.03	16	0.03	137
Co-resident grandparents	0.04	233	0.03	16	0.05	217
Education main respondent						
Secondary or lower	0.47	2268	0.58	371	0.46	1897
Tertiary or higher	0.53	2539	0.42	269	0.54	2270
Partnered						
Yes	0.91	4375	0.97	621	0.90	3754
No	0.09	432	0.03	19	0.10	413
Number of parity						
One	0.40	1931	0.40	260	0.40	1671
Two or more	0.60	2876	0.60	380	0.60	2496
Income categories (in euros)						
< 1000	0.17	823	0.17	149	0.18	932
> 1000 and < 1500	0.18	874	0.16	138	0.17	867
1500 > and < 2000	0.17	832	0.18	162	0.17	854
> 2000 and < 2500	0.17	833	0.37	324	0.31	1602
> 2500	0.30	1445				
Age main respondent						
18–27	0.04	174	0.01	13	0.03	161
28–33	0.14	689	0.09	80	0.12	609
34–38	0.29	1402	0.23	201	0.23	1201
39–45	0.53	2542	0.39	346	0.43	2196
Employment status main respondent						
Working	0.55	2625	0.65	418	0.53	2207
Not working	0.45	2182	0.35	222	0.47	1960
N =	4807		640		4167	

Percentages may not total 100 due to rounding

Source: SFS, 2018

Income level in the original data is measured as the household income after taxes. The original categories are: “I do not have any income”, “Less than 500 euros”, “Between 500 and 1000 euros”, “between 1000 and 1500 euros”, “between 1500 and 2000 euros”, “between 2000 and 2500 euros”, “between 2500 and 3500 euros” “between 3500 and 5000 euros”, “more than 5000 euros”, and “negative or unknown income”. In our initial sample, i.e., before sample selection there were 17 individuals with negative or unknown income, we dropped them and recode the income variable as follows: “Less than 1000 euros” (1000 euros included), “between 1000 and 1500 euros”, “between 1500 and 2000 euros”, “between 2000 and 2500 euros”, and “more than 2500 euros”. Turning to marital status, in Spain, selection between marriage and fertility plays a big role at the entry into

parenthood (Rutigliano & Esping-Andersen, 2018). However, given that we select people that are already parents, to avoid over-partitioning the sample we use a dummy for marital status distinguishing those who are in a partnership, i.e., either cohabiting or married, from those who are singles.

Furthermore, in line with previous studies (Tanskanen & Rotkirch, 2014) we look at the impact of fertility intentions across parities. In order to do so, we recode the variable about biological children and create a dichotomous variable which is zero for those with one child and one for all those individuals who have two or more children. Table 1 displays the distribution of these main explanatory variables for the full sample, and separated for men and women.

Methods

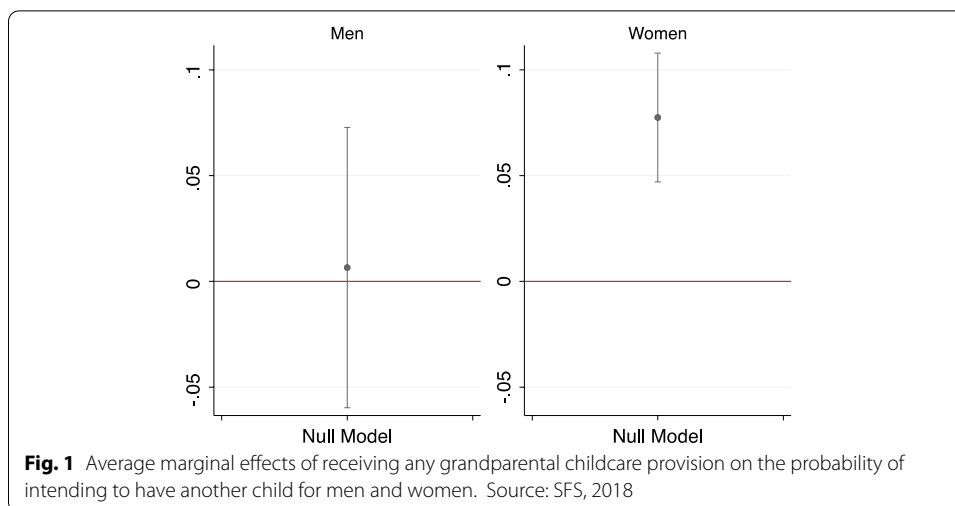
We use binary logistic regressions. Our modeling strategy includes first, a set of nested models run separately by women and men. Second, a model to explore the interaction effect between the level of education and any grandparental support on short-term fertility intentions. Third, a series of logistic models by parities in order to investigate the role of current number of children on short-term fertility intentions.

The set of nested models includes, a null model (M1), i.e., only including the variable for grandparental support. A model in which we add controls for age in categories and a dummy variable for the marital status (M2). In order to explore the impact of educational level, individual income and employment status, we specify different models adding these variables first one by one (M3, M4, and M5), due to their possible collinearity and then in pair of two (M6 and M7), and then all together (M8). Finally, to test the moderating impact of education on any grandparental support, we include an interaction between educational level and any grandparental childcare provision (M9).

In the light of the current debate about logistic model interpretation (e.g., Mood, 2010) and for the sake of clarity, we display average marginal effects (AME) and (adjusted) predicted probabilities of the main results. Indeed, AMEs jointly with predictive probabilities are the most adequate measure in order to compare effects across models (Mood, 2010). However, as shown in a recent article by Mize et al. (2019) beyond comparing different AMEs or predicted probabilities across models, it is also important to understand whether the differences across different model specifications are significant. For example, we explore (1) whether the impact of grandparental childcare support is statistically different for men compared to women; (2) whether the impact of grandparental support is statistically different in null model (M1) compared to other model specification, and (4) whether this impact differs across parity-specific models. In order to explore these differences, we follow Mize and colleagues (2019) and compute seemingly unrelated estimations and the Average Discrete Change (ADC) from logit specifications.

Results

The result section is structured as follows. First, we present the analyses in which we explore the impact of different socio-economic characteristics on fertility intentions separated for men and women. We run every set of models for each of our main explanatory variables, i.e., any grandparental support and intensity of grandparental support. Given that the two set of models have similar results, we present only results



for the measure of “any grandparental support” (complete regression results are available in Additional file 1: Table S2). Nonetheless, completed results for different intensity of grandparental support, can be found in Additional file 1: Table S3. Second, we focus on women’s results to explore the moderating effect of education of grandparental support and third, we explore the role of grandparental support on women’s short-term fertility intentions across parities.

Results for gender differences

Figure 1 illustrates the average marginal effects (AMEs) of having any grandparental support on men’s and women’s fertility intentions. AMEs in Fig. 1 are calculated on the base of M1 model, i.e., the model that has as sole explanatory variable “any grandparental support”. The association between fertility intentions and “any grandparental support” is not-significant across all the specifications for men, but it is significant for women (see Additional file 1: Table S2 for completed regression results). In order to check whether the differences between men and women observed in Fig. 1 are also statistically significant, we compute seemingly unrelated models (see Additional file 1: Table S4 for full results). Results of this test confirms that for men the average marginal effect of receiving any grandparental support is not statistically different from the average marginal effect of non-receiving any grandparental support on their fertility intention. Furthermore, the AMEs for men are slightly statistically different from the AMEs for women (see last row of Additional file 1: Table S4). All in all, as for men’s specifications we obtain a null result, from now onwards we focus on women’s results only.

Results for women socio-economic characteristics

Table 2 shows the average discrete changes (ADCs) of the eight nested models (M1–M8) and a test for their significance, as explained in the “Methods” section. Specifically, Panel A displays the ADCs of receiving any grandparental support on women’s fertility intentions for each of the eight nested model specifications. Hence, Panel

Table 2 Effect of having any grandparental childcare support on fertility intentions using average discrete changes from binary logit model (N = 4807)

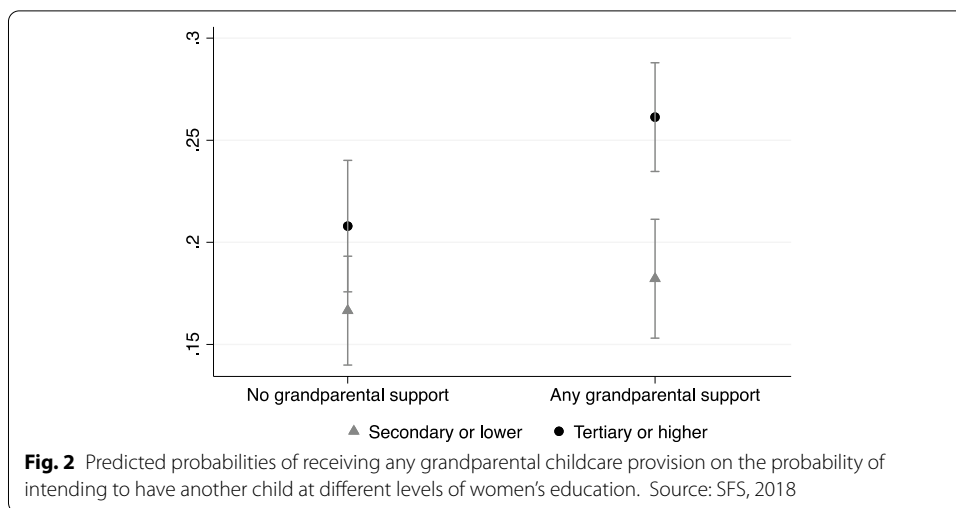
	Model 1 (M1) Null model	Model 2 (M2) M1 + controls	Model 3 (M3) M2 + education	Model 4 (M4) M2 + employment	Model 5 (M5) M2 + income	Model 6 (M6) M3 + employment	Model 7 (M7) M3 + income	Model 8 (M8) M6 + income
Panel A: Average discrete change (ADC)								
Any grandparental childcare	0.082*** (0.013)	0.044*** (0.012)	0.036*** (0.012)	0.040*** (0.012)	0.041*** (0.012)	0.034*** (0.012)	0.036*** (0.012)	0.034*** (0.012)
Panel B: Cross-model differences								
ADC Model 1—ADC Model 2	0.038*** (0.005)							
ADC Model 2—ADC Model 3	0.008*** (0.002)							
ADC Model 2—ADC Model 4	0.004* (0.002)							
ADC Model 2—ADC Model 5	0.003 (0.002)							
ADC Model 3—ADC Model 6	0.002 (0.001)							
ADC Model 3—ADC Model 7	0.000 (0.001)							
ADC Model 3—ADC Model 8	0.002 (0.002)							

Controls include age in categories and marital status of the main respondent. Standard errors are in parenthesis. * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Panel A of Table 2: we use average discrete changes (ADC) within the same models to obtain the difference between the adjusted predictive of using grandparental care and the adjusted predictive of not using it for each model specification

Panel B of Table 2: we use differences of ADCs across different models to provide a direct test of what the inclusion of a certain variable—in a series of nested models—is adding to the explanatory power of a certain model

Source: SF5, 2018



A illustrates how the magnitude of the association between any grandparental support and fertility intentions changes with the introduction of any additional variable into the model. In the null model (M1), the probability of intending to have another child is 0.08 higher for a woman who receives any grandparental support. Models 3 adds educational level which reduces the impact of grandparental support on fertility intentions to 0.04, but it is still significant. Overall, the ADCs are positive and significant indicating that there is a fairly robust association between any grandparental support and women' fertility intentions.

Panel B, in Table 2 shows models comparison. First, we test whether adding controls, i.e., categorical age and marital status significantly reduce the impact of any grandparental support on women's fertility intentions ("ADC_{Model1}—ADC_{Model2}" in Panel B of Table 2). The coefficient (0.038) is significant; therefore, the introduction of controls has significantly reduced the impact of any grandparental support on women's fertility intentions by 0.038. We then proceed to compare ADCs due to the addition, one by one, of education, income and employment status, respectively.⁴ As shown in Table 2 Panel B, there is significant reduction of the impact of any grandparental childcare support driven by education levels (0.008), less significant reduction driven by employment status (0.004), and no significant impact of the inclusion of the income variable (0.003). However, as explained in the "Methods" section, our variable for both employment status and income levels are cross-sectional and do not measure employment or income trajectories.

Due to these results, we decided to focus on the role of education because it is constant over time, and it is also a proxy for different individual values. Figure 2 presents predicted probabilities (PPs) of intending to have another child for the interaction between receiving any grandparental support and women's level of education (M9). Low-educated women display a lower intention to have another child compared to their high-educated counterparts. However, this difference is statistically significant only for

⁴ i.e., at the direct comparison of M2 with M3 ("ADC_{Model2}—ADC_{Model3}" in Panel B of Table 2); M2 with M4 ("ADC_{Model2}—ADC_{Model4}" in Panel B of Table 2) and M2 with M5 ("ADC_{Model2}—ADC_{Model5}" in Panel B of Table 2).

Table 3 Coefficients of logistic nested models of any grandparental childcare provision on intention to have second and higher-parity child in the next 3 years

	Panel A				Panel B			
	Intention to have a second child				Intention to have the third or higher child			
	P (0)	P (1)	P (2)	P(3)	P (0)	P (1)	P (2)	P(3)
Grandparental support (ref. = None)								
Any grandparental support	0.570*** [0.125]	0.432** [0.137]	0.397** [0.138]	0.331 [0.212]	- 0.083 [0.195]	- 0.188 [0.200]	- 0.237 [0.195]	- 0.561 + [0.292]
Co-resident grand-parents	0.145 [0.235]	0.229 [0.291]	0.202 [0.294]	0.309 [0.391]	- 0.597 [0.510]	- 0.800 [0.560]	- 0.824 [0.563]	- 0.836 [0.688]
Age main respondent (ref. = 28–33)								
18–27		- 0.361 [0.270]	- 0.307 [0.275]	- 0.320 [0.276]		0.223 [0.432]	0.283 [0.429]	0.316 [0.429]
34–38		- 0.600*** [0.170]	- 0.621*** [0.170]	- 0.627*** [0.171]		- 0.752** [0.244]	- 0.816** [0.254]	- 0.832** [0.255]
39–45		- 2.027*** [0.177]	- 2.058*** [0.179]	- 2.063*** [0.179]		- 1.945*** [0.274]	- 2.034*** [0.286]	- 2.030*** [0.283]
Partnership (ref. = yes)								
No		- 0.940*** [0.245]	- 0.921*** [0.245]	- 0.926*** [0.246]		- 0.103 [0.473]	- 0.061 [0.479]	- 0.047 [0.481]
Education (ref. = secondary or lower)								
Tertiary or higher			0.210 [0.138]	0.175 [0.215]			0.306 [0.215]	0.078 [0.283]
Education × Any grandparental support (ref. = Secondary or less/ No Gp Support)								
Grandparental support # Tertiary				0.111 [0.280]				0.605 [0.404]
Co-resident gp # Tertiary				- 0.234 [0.535]				- 0.003 [1.121]
Constant	- 0.760*** [0.095]	0.318* [0.158]	0.230 [0.170]	0.252 [0.191]	- 2.374*** [0.129]	- 1.259*** [0.206]	- 1.338*** [0.217]	- 1.244*** [0.234]
Observations	1671	1671	1671	1671	2496	2496	2496	2496

Dependent variable: Any grandparental support
 Standard errors in brackets + $p < 0.1$ * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

women who receive any grandparental support. In other words, receiving any grandparental support makes a difference in terms of fertility intentions mostly among highly educated women. Receiving any grandparental support increases the predicted probabilities of high-educated women by 0.07 with respect to their low-educated counterpart.

Results for parity

Table 3 shows the coefficient for a series of logistic nested models modeling the impact of any grandparental support on fertility intentions of having a second (Panel A of Table 3) and a third or a higher-parity child (Panel B of Table 3). Receiving any grandparental support has a positive and significant impact on the intention to have a second

child but not on the intention of having three or more children. This is probably because, as explained in the *Background* section, desired family size in Spain has been stable around two children (Adsera, 2006; Esteve et al., 2021).

Furthermore, compared to the previous models in which women are all pooled together, the size effect for women intending to have a second child seems to be larger. However, due to the fact that we are handling non-linear models, coefficients are not directly comparable (e.g., Mood, 2010), therefore we also calculate seemingly unrelated models and ADCs (see Additional file 1: Table S5). Our results show that receiving any grandparental support for those women intending to have a second child lead to higher and statistically significant predicted probabilities compared to those women who do not receive any grandparental support. Furthermore, although the impact of grandparental support for women intending to have a second child is statistically different from those intending to have a third or higher parity child and receiving grandparental support, the difference of the differences is not statistically significant (see Additional file 1: Table S6).

Robustness checks

In order to be sure that our results are not driven by sample selection and other types of biases, we perform several robustness checks.

- 1) We run all the analyses without using population weights, and we found similar results.
- 2) Given that in our dependent variable the number of zeros is fairly high, we run models for rare events which instead of standard maximum likelihood use penalized maximum likelihood estimation to account for the high number of zeros in the dependent variable (Heinze & Schemper, 2002; Puhr et al., 2017). In order to carry out this analysis we use the command *firthlogit* for Stata 13 (Coveney, 2021). Results from this analysis confirmed that our findings are robust.
- 3) We run the model with the original categorization of educational level and did not find significant differences with the final results beyond differences in the significance probably due to the reduced sample size.
- 4) We run the models (1) using the employment four-categories variable (i.e., “temporary”, “permanent”, “no contract”, “unemployed”), and (2) dropping individuals who are working but without a contract. In both cases the results prove robust. None of these models altered the significant and positive association found among women, and the not-significant association for men (results are available upon request).

Discussion

In the current study, we analyze the relationship between receiving grandparental support and fertility intentions among Spanish parents. Specifically, taking advantage of the data from the new 2018 Spanish Fertility Survey, we focus on the role of gender (H1), socio-economic position (H2) and different parity transitions (H3) on short-term fertility intentions.

We find that first, receiving any grandparental support is associated with a positive and significant increase of fertility intentions for women but not for men. Our H1 is confirmed by our findings. Second, the interaction between women's education levels and any grandparental support shows that for high-educated women receiving any grandparental support significantly increases their fertility intentions compared to their low-educated counterparts. Thus, our findings confirm our second hypothesis, H2. Finally, when accounting for the number of children, the impact of receiving any grandparental support results stronger for those women who intend to have a second child compared to those intending to have a third or a higher-parity although the difference between these two models are not significant. This evidence only partially confirms our third and last hypothesis (H3).

On a more speculative note, our results indicate that grandparental support matters but only for women's fertility intentions. In line with previous findings, one possible explanation might be the different perception across genders about the cost of children (Liefbroer, 2005). Even though men have increased their participation at home, women are still the main responsible for household chores and childcare activities (Nomaguchi & Millie, 2020). This gender unbalance is even stronger in a country like Spain (Garcia-Roman 2021; Martinez and Cortina 2021). Thus, receiving an external source of childcare such as grandparental support, might influence women's future fertility plans more than men's. Furthermore, another possible explanation lies on how couples decide about having another child. A recent study in Italy, a country which is fairly comparable with Spain, shows that after the birth of the first child, if the woman is not willing to have a second or higher parity, generally her male partner tends to support her decision (Testa et al., 2011). Thus, the null finding for men might also be interpreted as a consequence of men's and women's different bargaining power in reproductive decisions (Doepke & Kindermann, 2019).

Once we focus on women, we find that the positive role of grandparental support remains across all the specifications. This finding is in line with the literature about actual fertility in which grandparents with their flexible and mainly free childcare provision lower the cost of childbearing facilitating further fertility transitions (e.g., Aassve, Arpino, et al., 2012; Aassve, Meroni, et al., 2012; Thomese & Liefbroer, 2013). Spain is considered a *familialistic* country (Esping-Andersen, 2009; Gauthier, 2007; Rutigliano, 2020) in which family values are structural components of this society. Thus, the strong association between grandparental support and women's fertility intentions might depend on the value attached to grandparental support in such a context. In other words, women might want to have another child not only because grandparental support softens their work-family conflict, but also because they want their children to be with grandparents, to make their children experience the same family ties they had within their family of origin.

Interestingly, high-educated women are those who benefit the most from grandparental support in terms of fertility intentions. In the Spanish context, high-educated women are those with more stable work-trajectories and with highest motherhood penalty (De Quinto et al. 2021). In parallel, Spanish high-educated mothers are also those with the most positive rates of second births (Baizan, 2009). Hence, as pointed out by Tanskanen and Rotkirch (2014), for these women receiving grandparental support may be the *extra*

push to act faster on an already made decision, i.e., having another child. Finally, when it comes to parity, grandparental support seems more important for women with one child. This finding should be interpreted within the Spanish fertility context. First, even though in our sample, women with two or more children outnumber women with one, the proportion of those who intent to have another child is the highest among one-child women. This might be very well-explained by the average desired number of children in Spain, which is around 2 (Esteve et al., 2021). Second, in a context of delayed and forgo fertility, desiring more than 2 children especially for younger generations represents a rare event.

As in any study, some limitations need to be addressed. First, we cannot distinguish which grandparent is providing support, how many grandparents are involved and which type of activities they are conducting while with the grandchild. Second, we do not have any information on co-resident grandparents which forced us to consider them as a separated category in the analysis. Third, although our data represent the most important source of data for Spanish fertility studies, it is cross-sectional. Beyond some limitation in measuring certain variables (e.g., employment status rather than trajectories), this implies that we cannot verify whether these intentions turn into behaviors. Longitudinal data collection in Spain is needed to properly disentangle the role of informal childcare on fertility intentions and behaviors. Fourth, due to data limitations and the high prevalence of childless men in our data, we ended up with a relatively small men sample ($N=640$), which might affect the robustness of our null finding. Future research is needed to provide more robust evidences on the relationship between men's fertility intentions and grandparental support. Finally, we have information about other types of childcare that might complement grandparental support and influence fertility intentions. However, due to data limitation it was not possible to take advantage of this additional information and to combine it with grandparental support.

To conclude, this study shows that grandparental support positively impacts women's fertility intention to have another child across all the specifications. However, for high-educated women, who experience higher work–family conflict, grandparental support appears more important for future fertility transitions. Beyond grandparental childcare, previous research about Spain (Baizan, 2009) have highlighted the importance of formal public childcare for enhancing fertility in this context. Understanding how these other different sources of childcare interact with grandparental support and with both desired and actual fertility, remains an important topic for the future research agenda. This is especially relevant for the Spanish context, one of the lowest-low fertility countries in which the gap between desired and achieved fertility remains large.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s41118-022-00161-x>.

Additional file 1: Table S1: Descriptive Statistics for the Dependent Variable. **Table S2:** Coefficients of logistic nested models of any grandparental childcare provision on intention to have another child in the next three years for men and women. **Table S3** Coefficients of logistic nested models of different intensity of grandparental childcare provision on intention to have another child in the next three years for men and women. **Table S4:** Formal test of differences men Vs women via seemingly uncorrelated models. **Table S5:** Formal test of differences women with one child Vs women with two or more children via seemingly uncorrelated models. **Table S6:** Formal test of differences women with one child Vs women in the full sample via seemingly uncorrelated models.

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Authors' contributions

RR carried out the analysis and she wrote the theoretical framework of the article. ML contribute building the background of the article and gave feedback on the analysis. Both authors read and approved the final manuscript.

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Availability of data and materials

The dataset analyzed during the current study is available in https://www.ine.es/dyngs/INEbase/en/operacion.htm?c=Estadistica_C&cid=1254736177006&menu=ultiDatos&idp=1254735573002.

Declarations**Competing interests**

The authors declare that they have no competing interests.

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