

Effects of Grandmothers' Proximity on Mothers' Labor Force Participation*

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Abstract

This paper investigates the causal effects of grandmothers' geographical proximity on the labor supply decisions of married women with young children by leveraging a novel data set from Turkey. We deal with the reverse causality and endogeneity problems arising from mothers' and grandmothers' joint location and labor supply decisions by implementing a two-stage least squares estimation method using the number of alive grandmothers as an instrument. We argue that grandmothers' proximity can increase mothers' labor supply through their free and flexible childcare services. On the other hand, geographically close grandmothers can reduce mothers' labor supply by imposing the traditional gender norms prevalent in Turkey or requiring elderly care. The overall effect depends on the relative size of these opposing factors. Our results suggest that living in the same neighborhood to grandmothers increases the probability of labor force participation and the employment rates of women with young children by 18.2 ppt and 16.4 ppt, respectively, driven by the non-village sample. The "traditional gender norm" channel explains the insignificant impact of grandmothers' proximity on mothers' labor market outcomes who have been raised in villages.

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1 Introduction

Female labor force participation has important implications for women and the economies they live in. It improves women's bargaining and decision power within the household (Anderson and Eswaran, 2009; Majlesi, 2016). It is also an important driver of growth and development (Verick, 2018; Klasen, 2019). Yet, in many countries, such as India, Turkey, Saudi Arabia, and Mexico, female labor force participation rates stay low.

Several factors, such as education level, gender norms, culture, fertility rates, and childcare facilities affect female labor force participation decisions (Leibowitz and Klerman, 1995; Vuri, 2016; Akyol and Okten, 2019). In this paper, we investigate the effect of grandmothers' geographical proximity on the labor supply decisions of married women with young children by using the 2016 Turkish Family Structure Survey.

Grandmothers' proximity may affect female labor market participation through three channels. The first channel is the possible help of grandmothers in childcare activities. The literature shows that increased childcare costs are a massive barrier for women to participate in the labor market (Heckman, 1974; Blau and Robins, 1988; Klerman and Leibowitz, 1990; Connelly, 1992; Ribar, 1992; Kimmel, 1998). Essentially, the presence of young children in the household increases the reservation wage of women, decreasing their labor supply (Leibowitz and Klerman, 1995).¹ Therefore, the availability of grandparents in a geographically close distance who can provide free and flexible childcare can be a factor that can increase female labor force participation by reducing women's reservation wages. On the other hand, inter generational transfers may also operate the other way around. Care duties to grandmothers in need of care may discourage women's labor market participation (Ettner, 1996; Kolodinsky and Shirey, 2000; Maurer-Fazio et al., 2011; Paganini and Marenzi, 2008). The third channel we consider is the traditional gender norm channel. Grandmothers living at a close distance can better monitor women's behavior and impose traditional gender roles on women with children. Several studies document the link between women's labor market outcomes and gender norms (Fernández et al., 2004; the survey by Marianne, 2011; Olivetti et al., 2020). Given the prevailing gender norms against women's employment in Turkey², grandmothers' close geographical proximity might reduce the labor market participation rates of married women with young children. Therefore, the effects of grandmothers' proximity on female

¹In addition, after the birth of a first child, women may experience a large drop in their earnings (Kleven et al., 2019).

²According to the 2018 World Value Survey, in Turkey, 50 percent of women and 53 percent of men state that they agree or strongly agree with the statement that "When a mother works for pay, the children suffer." In addition, according to a survey conducted in a representative sample of adults by Konda, Research and Consulting company in 2015, 63 percent of women and 71 percent of men state that they agree or strongly agree with the statement that "The main responsibility of the woman is to raise kids and run a household."

labor market participation depend on the size of these opposing factors.³

In Turkey, as of 2019, women's labor force participation was 38.7 percent, which is below the OECD average of 65 percent (see Figure A1).⁴ According to the 2016 TFSS, 75 percent of women state they are not working because they do the household chores, elderly care, or child-rearing (see Table A1). Especially, the unskilled group of women that constitutes a large share of women in Turkey drop the labor market due to low market and high reservation wages (Dayıođlu and Kırdar, 2010). Another important determinant of female labor force participation is the presence of a young child, which discourages women from entering the labor market, partially because of the absence of available and/or affordable formal childcare services. A recent report by the World Bank (2015) presents that there is a lack of affordable and quality childcare service providers to satisfy the needs of full-time working parents in Turkey. The most affordable childcare services, mostly run by public sectors, offer a half-day service that is incompatible with full-time working mothers' needs. Another problem is, as there is a lack of childcare centers close to home, drop-off/pick-up time can be exhausting, or working mothers may fail to respond to the unanticipated needs of their child if there is a problem in the care center. Therefore, most women either have to take care of their children or turn to free childcare provided by relatives. Therefore, understanding the causal relationship between women's decision to work and grandmothers' proximity, and the potential mechanisms through which grandmothers' proximity may affect mothers' labor market outcomes has important policy implications.

Examining the causal relationship between grandmothers' geographical proximity and mothers' labor force participation decisions is empirically challenging as mothers' labor supply decisions, and grandmothers' or mothers' residential choices might be made simultaneously. Besides, unobserved factors can affect both the decisions to work and residential preferences. In particular, those who have grown up in more traditional families are more likely to stay closer to their mother or mother-in-law (Autaç, 1998; Aykan and Wolf, 2000), and they are less likely to work (Göksel, 2013, Dildar, 2015, Atasoy, 2017). In this paper, we use the instrumental variable estimation method and the number of alive grandmothers as an instrument for the grandmothers' geographic proximity to deal with the endogeneity and reverse causality problems.

We first show that the number of alive grandmothers is a strong predictor of having at least one

³In a similar setting in India, Khanna and Pandey (2021) investigate the role of the coresiding mother-in-law on the daughter-in-law's labor market participation.

⁴There is a vast amount of literature that argues that one of the most important determinants of low female labor force participation in Turkey is education (Tansel, 2002; Bařlevant and Onaran, 2003; Dayıođlu and Kırdar, 2010). In addition, social norms and cultural factors play an important role in the formation of female labor force participation (Uraz et al., 2010; Akyol and Okten, 2019). Some attempt to identify this by focusing on religiosity/conservatism (Göksel, 2013; Guner and Uysal, 2014; Atasoy, 2017) while others argue that women's social role as caregivers and their responsibility for housework, which is the dominant view in Turkey, relates to low female labor force participation (İlkkaracan, 2012; O'Neil and Bilgin, 2013; Gedikli, 2014; Dildar, 2015).

grandmother residing at a close distance.⁵ Our results show that living in the same neighborhood or closer to a mother or mother-in-law leads to 18.2 and 16.4 percentage points (ppt) increase in labor force participation and employment probabilities of married women with young children, respectively. When we define proximity as living in the same town with at least one grandmother, we find a 13.6 ppt and 12.3 ppt increase in the mothers' labor force participation and employment probabilities. Our estimates are slightly decreased, as expected, to 13.2 ppt and 11.9 ppt when we define close geographical proximity as living in the same city. Next, we investigate the causal channels through which proximity affects labor market outcomes of married women with young children. To check whether grandmothers' childcare provision drives our results, we investigate the effects of grandmothers' proximity on women without young children and men with young children whose decisions of work do not depend on any childcare transfer (İlkkaracan, 2010). We show that for these groups, the estimates are not significant and relatively small in terms of size. We further show that the proximity of grandfathers, who are expected to have less responsibility in childcare activities, is not a determinant of mothers' labor force participation or employment.

Our data allows us to investigate the two other channels that can link the grandmothers' proximity and mothers' labor market outcomes, namely the traditional gender norm and the elderly care channels. We investigate the effects of grandmothers' proximity on four traditionality and religiosity variables.⁶ Our results suggest that grandmothers' proximity does not have a significant effect on traditionality variables⁷ for the total sample. However, the results differ substantially for the sample of women who have grown up in village v.s. non-village areas. Grandmothers' proximity significantly increases mothers' traditionality and religiosity in the village sample, while the results are small and insignificant for the non-village sample. We also could not find any differential effects of mother's or mother-in-law's proximity on traditionality and religiosity variables.

We finally investigate whether grandmothers' proximity has any effects on mothers' labor market outcomes through the elderly care channel. Our results do not provide any evidence that the elderly care channel has the potential to affect our main results. These findings suggest that the results for labor market outcomes for the village sample reflect the net effect of childcare and traditionality. In our heterogeneity analysis, consistent with this finding, we find that the grandmothers' proximity has a significant and positive effect on labor market outcomes of mothers who have grown up in city or district centers(non-village), while the effects estimated for mothers who have grown up in villages are small and insignificant. In a separate heterogeneity analysis, we divide our

⁵Our proximity variable is a dummy variable equal to one if at least one grandmother residing at a close distance, zero otherwise.

⁶These variables are "Having Son Preference", "Finding Women's Working Inappropriate", "Not approving the Interfaith Marriage" and "Traditionality Index" which is the first principal component of all the variables used to construct three traditionality and religiosity variables.

⁷The only exception is the significant positive effect we observe for "Not approving the Interfaith Marriage".

sample into conservative and non-conservative groups according to our constructed traditionality index.⁸ Our results show that grandmothers' proximity affects labor market outcomes positively and significantly only in the non-conservative group. Further heterogeneity analysis reveals that the results are driven by less educated women whose reservation wage would be more sensitive to the cost of formal childcare. Similarly, the results are much stronger for women who do not own a house, which can indicate low-income levels. We also show that the main results are driven by the effect of own mother rather than the effect of mother-in-law. Finally, we check our results' robustness and show that they are not sensitive to different sample specifications.

Our paper, firstly, contributes to the broad literature that investigates the factors affecting female labor force participation, such as social norms, religiosity and culture (Akerlof and Kranton, 2000; Fernandez, 2007; Fernández and Fogli, 2009; Dildar, 2015; Akyol and Okten, 2019), fertility and motherhood (Angrist and Evans, 1998; Cristia, 2008; Agüero and Marks, 2008; Lundborg et al., 2017 and Kleven et al., 2019), and availability and cost of childcare (Baum, 2002; Berlinski and Galiani, 2007; Tekin, 2007; Fitzpatrick, 2010; Berlinski et al., 2011; Brilli et al., 2016; Morrissey, 2017; Müller and Wrohlich, 2020). We complement this literature by providing evidence that the proximity of the grandmothers can increase women's labor force participation through their childcare provision or impede their labor force participation by imposing prevalent unequal gender norms on women.

Our paper is also related to the literature that investigates the effects of family structure on women's labor market outcomes. The literature show that coresidence with elderly parents has a significant positive effect on married women's labor market outcomes in Japan (Ogawa and Ermisch, 1996 and Sasaki, 2002) and in China (Maurer-Fazio et al., 2011 and Shen et al., 2016). Shen et al. (2016) also show that the positive impacts of this living arrangement are more prominent in urban areas than rural areas, which is also consistent with our results. Two recent papers examine the effects of the death of coresiding grandmothers on mothers' employment and labor force participation. Khanna and Pandey (2021) finds that mother-in-law's death reduces her daughter-in-law's labor force participation in the Indian context and Talamas (2020) finds that the deaths of coresiding grandmothers reduce mothers' employment rate in the Mexican context.⁹ On the other hand, Dhanaraj and Mahambare (2019) examines the role of coresiding family members in married women's decision to take up non-farm work in rural India and finds that the coresidency decreases women's non-farm employment, which is driven by lower autonomy of those women. Our paper contributes to this literature by providing evidence in a different country context that

⁸Those with a traditionality index above the median are defined as conservative, and the rest are defined as non-conservative.

⁹Our reduced form results presented in Table A2 where we investigate the effect number of alive grandmothers on mothers' labor force participation rate are consistent with the findings of Khanna and Pandey (2021) and Talamas (2020).

not only coresidence but living in close proximity to grandmothers also affects women's labor market outcomes positively, and the results are driven by less educated women and women who have raised in city or district centers. Our paper also provides an insight about the contradictory findings in the literature by showing that for women who have grown up in villages, grandmothers' proximity does not have a significant impact on mothers' labor supply, and it increases their probability to have more traditional gender views. Therefore, grandmothers' proximity can move mothers' probability to work in either direction depending on the size of these opposing effects.

This paper also contributes to the literature that investigates the effect of grandparental childcare on maternal labor force participation. The evidence in the literature shows that having grandparents help with childcare encourages mothers to join the labor market (see Posadas and Vidal-Fernández, 2013; Arpino et al., 2014; Bratti et al., 2018; Aparicio-Fenoll and Vidal-Fernandez, 2015 and Zamarro, 2020).¹⁰¹¹ Dimova and Wolff (2011) show that frequent childcare provided by maternal grandmothers is positively associated with the young mothers' employment probability in ten European countries.¹² Aassve et al. (2012) points out that these results may differ according to the intra-household dynamics in the corresponding country. They find that receiving childcare help from grandparents has a positive and significant impact on the mother's labor supply decision in France, Germany, Bulgaria, and Hungary. However, for Georgia, Russia, and the Netherlands, they do not show any significant effect of informal childcare on mothers' work decisions.

Our paper is most closely related to Compton and Pollak (2014). Compton and Pollak (2014) show that close geographical distance to mothers or mothers-in-law has a positive impact on the labor supply of married women with young children, and the proximity works through the mechanism of childcare in the U.S. To deal with the endogeneity of grandparents' geographical proximity, they consider a sample of military wives as their husbands' locations are largely determined by the military exogenously. Because of the data limitations, they do not observe the geographical distance of the respondent to her mother; but they use the information based on whether the mother lives in her birth state as a proxy for distance to the grandmother in their analysis that they take into account the endogeneity of proximity.

Different from Compton and Pollak (2014), we observe the information on geographical proximity more precisely and solve the endogeneity problem for the whole sample rather than just for a subsample. We also provide further insight into the subject using different measures of proximity definition. As clearly explained by Compton and Pollak (2014), different from regular

¹⁰For a recent review of the literature on the effect of grandparental childcare on labor supply of women see Zanella (2017).

¹¹Battistin et al. (2014) show that delayed retirement induced by pension reforms decreases the number of hour devoted to childcare by grandparents and has a strong negative effect on their offspring's fertility.

¹²These countries are Austria, Germany, Netherlands, Sweden, Spain, Italy, Denmark, France, Greece, and Switzerland.

grandparental childcare, focusing on the effect of proximity will include the insurance aspect of childcare to meet irregular or unanticipated needs. The studies listed above do not consider the insurance aspect of grandparents' availability for childcare. This aspect of proximity can be very important in the Turkish setting as there is a lack of childcare services to satisfy working mothers' needs. On the other hand, having a grandmother(in-law) within a geographically close distance may negatively affect mothers' labor supply decisions, as prevalent gender norms in Turkey are hostile to women's labor market participation. The literature overlooked the effect of proximity through traditional gender norm channel, which we carefully examine and show that it is relevant for women raised in villages. These findings are informative from a policy perspective, as increasing public-provided childcare in rural settings may not improve female labor market outcomes. Therefore, more carefully designed policies that interact with traditional gender norms are needed.

The organization of the paper is as follows: In the next Section, we propose a simple conceptual framework that explains how grandmothers' proximity can affect mothers' labor market outcomes. Section 3 describes the data. We explain the methodology in Section 4, and report the main results in Section 5. Section 6 investigates the mechanisms through which the proximity of grandmothers' affects mothers' labor market outcomes. In Section 7, we investigate the heterogeneity of our results and implement several robustness checks to verify our findings in Section 8. Section 9 concludes the paper.

2 Conceptual Framework

In this section, we consider the relevant conceptual perspectives that depict possible channels through which the grandmothers' proximity can affect the labor supply decisions of married women with children and review the related empirical literature. Grandmothers' proximity can affect the mothers' labor supply decision through their childcare transfers. As Heckman (1974) and Blau and Robins (1988) mention, childcare services can be provided informally, most often by a relative, either unpaid or low-cost in monetary terms. Considering a neoclassical labor supply model, the availability of free/reduced-cost caregiving services would decrease mothers' reservation wages, increasing their labor force participation and employment rate (Cardia and Ng, 2003; Belan et al., 2010 and Dimova and Wolff, 2011). Besides, it is plausible that the probability of receiving help with childcare from grandmothers increases as proximity gets closer. Therefore, we expect that the effects of the proximity of grandmothers on mothers' labor supply get larger as the geographical distance between mothers and grandmothers gets closer (Garcia-Moran and Kuehn, 2017). In addition, the impact of grandparental proximity on mothers' labor supply is expected to vary across women of different earnings capacities. The free childcare transfer by grandmothers would make a higher percentage decrease in the reservation wage for the sample of mothers with

lower earnings capacities. Therefore, if we only consider the childcare transfer channel, we expect to observe a larger effect of grandmothers' proximity on the labor force participation rate of women with lower earnings capacities relative to higher earnings capacities. In our empirical specification, we proxy earning capacity with the education level and house ownership and investigate the heterogeneity of our results.

Contrary to the childcare transfer mechanism, which contributes to the increased labor supply of women with children, intergenerational transfers may also operate the other way around. Care duties to older relatives in need of care may discourage women's labor market participation (Ettner, 1996; Kolodinsky and Shirey, 2000; Maurer-Fazio et al., 2011; Pagani and Marenzi, 2008). Especially in traditional families with strong family ties and gender norms, home production in the form of elderly care or childcare is mainly performed by wives and daughters (Alesina and Giuliano, 2010).¹³ Therefore, we expect upward time transfers to be a constraint for women who have grown up in more traditional family environments. As the proximity between grandmothers and mothers gets closer, this channel is more likely to work in the opposite direction to decrease mothers' labor supply. Therefore, we will investigate our results separately for women who have grown up in more traditional areas proxied by the village-type of childhood region.¹⁴ In the literature, informal caregiving to an older person is usually proxied by co-residency (see Pezzin and Schone, 1999). Therefore, we will also exclude individuals in co-residency from our analysis to check the effect of the elderly care channel on our results.¹⁵

Apart from intergenerational transfers of time in the form of grandparenting or elder care, geographically close grandmothers can also impose traditional gender norms and reduce women's employment by restricting women's decision-making authority or access to resources, such as education and information (Debnath, 2015; Dhanaraj and Mahambare, 2019, Khanna and Pandey, 2021). We expect this reduction to be more pronounced among women raised in a village who have a comparative advantage in household production, and are exposed to more traditional gender norms. Similarly, as grandmothers' proximity gets closer, it will be easier for them to monitor mothers' behavior. Therefore, the probability of imposing restrictive gender norms may increase as grandmothers' geographical distance gets closer.

Considering these channels, the overall impact of these alternative mechanisms through which the grandmothers' proximity might affect mothers' labor force participation can not be predetermined. Subsidizing a grandparent's time may raise the labor supply (Cardia and Ng, 2003). However, if there are strong gender norms against women's employment or an increase in daughters'

¹³Similar patterns are observed in Turkey. According to the 2016 Research on Family Structure Survey data set, the Ministry of Family, Labor and Social Services (Turkey) reports that daughters-in-law and daughters are the main providers of care to the elderly (27.8% and 23.1%, respectively).

¹⁴Table A3 shows that among the women raised in villages, traditionality or religiosity are more prevalent.

¹⁵We cannot analyze the sample of women coresiding with elderly parents as we only have 388 observations.

provision of caregiving to their elderly parents, such a policy may backfire. Therefore, it requires an empirical investigation to understand the direction of the effect.

3 Data

In this paper, we use the 2016 Turkish Family Structure Survey (TFSS), which was conducted by the Turkish Statistical Institute and the Ministry of Family and Social Policies. The TFSS is collected to understand the changes in the family structures and lifestyles in Turkey. The survey was conducted between 1 June-26 September 2016 among 35,475 individuals in 17,239 households. It is representative at the NUT-1 level and three major provinces (İstanbul, İzmir, Ankara). The survey consists of Individual and Household questionnaires. The Individual questionnaires cover all individuals over 15 years old who live in a household and contain information on demographics, family structure, labor market outcomes, and a unique identifier that helps us match with their partners, if available. It also consists of questions about the proximity of residence of the mother and the mother-in-law. More specifically, it includes the questions: “What is the proximity of residence of your mother?” and “What is the proximity of residence of your mother-in-law?” The possible answers are: nonexistent, dead, same house, same building, same neighborhood/district/village, same city and same town, same city but a different town, different city, abroad. We use these variables to determine whether grandmothers are alive and whether they live close by. Household questionnaires collect data on all the individuals in a household, including children under 15 years old, and contain information about household resources.

In this paper, we investigate the role of grandmothers’ geographical distance on the mother’s labor market outcome. Therefore, we restrict our sample to married mothers aged 18-50 who live in a cohabiting union with *at least one child ten years old or younger*.¹⁶¹⁷¹⁸ We exclude single mothers as our data do not include information on husbands unless they live in the same household. After dropping observations with missing values, the sample consists of 3,542 observations of a relatively homogenous group of women.¹⁹

We define two labor market outcomes: (1) labor force participation (LFP), a variable taking the value of one if the mother is employed or looking for a job and zero otherwise, and (2) employment is equal to one if she worked at least an hour during the reference period and zero otherwise. To focus on paid and formal employment in the form of a regular employee, casual employee, employer, or self-employed worker, we define LFP and employment measures equal to 0 if she

¹⁶In Turkey, primary education includes two four-years levels. Children aged 6 to 9 attend the first level of primary education and attend the second level when they turn 10.

¹⁷Our results are robust to using 40 or 45 as an age cut-off for mothers.

¹⁸We show that our results are robust to using a different age threshold for children in Section 8.

¹⁹The proportion of single mothers is only 6% in the nationally representative sample survey (TFSS, 2016).

works as an unpaid worker.²⁰²¹²²

We construct three different variables for the geographical proximity of grandmothers. Each variable is equal to one if at *least one* of the grandmothers lives (i) *in the same neighborhood/village/district or closer*, (ii) *in the same city, same town or closer*, or (iii) *in the same city or closer*, and zero otherwise.²³ We name the first proximity measure as “District,” the second one as “Town,” and the last one as “City.” Note that the proximity variable “District” denotes the shortest distance, “Town” denotes medium distance, and “City” denotes the longest distance.

After establishing the results about the effect of proximity on mothers’ labor market outcomes. We investigate three possible channels through which grandmothers’ proximity can affect mothers’ labor market outcomes that we explained in the previous section. To examine the childcare provision channel, we construct labor force participation and employment variables for fathers with young kids (child ten years old or younger) in the same way we define it for mothers. Similar to the grandmothers’ proximity, we also construct grandfathers’ proximity.

We also construct four different outcome variables as an indicator of traditionality and religiosity: i) Son preference, ii) Finding women’s working inappropriate, iii) Not approving the interfaith marriages, iv) Traditionality index. We use two survey questions to construct “Son preference” variable. The survey respondents are asked whether they totally disagree, disagree, partially agree, agree or strongly agree with the statements: “A son makes mother more respectable” and “Only a son can ensure the continuation of the family bloodline”. If the respondent agrees or strongly agrees with any of these statements, “Son preference” variable is coded as 1 and it is coded as 0 otherwise.

Our second key variable, “Finding women’s working inappropriate”, is constructed by using the survey question “Do you find women’s working appropriate? ”. If the answer to this question is “No ”, we code it as 1, and 0 otherwise.

We also construct “Not approving the interfaith marriages” variable by using the survey question that asks respondents whether they totally disagree, disagree, partially agree, agree or strongly agree with the statement: “People from different religious sects can marry each other” . We define

²⁰The effects of grandmothers’ proximity on mothers’ LFP and employment are not expected to be the same ex-ante for at least two reasons. There might be discrimination against women with kids in the labor market and/or having kids might have changed mothers’ preferences about job characteristics such as flexibility or close location. Assuming that grandmothers’ proximity does not affect the degree of discrimination against women with kids and mothers’ preferences about job characteristics, grandmothers’ proximity is expected to have a smaller impact on mothers’ employment rate. Therefore, to get a better sense of the impact of grandmothers’ proximity, we consider both supply and demand-side factors by focusing on both labor force participation and employment status of women as outcome variables.

²¹The results of the analysis are unchanged if unpaid family workers are included in the paid labor force and employment. These results are presented in Table A4.

²²We also exclude individuals continuing their education or those who are retired or disabled from our analysis.

²³In the questionnaire, town refers to a type of territory that is larger than neighborhood, village, or district.

it as 1 if the respondent disagrees or totally disagrees with the statement, 0 otherwise. Finally, we construct an index for conservatism which is the first principal component of all four variables that we used to construct three traditionality and religiosity variables.

Table 1 reports the summary statistics of households' background characteristics by the proximity of the grandmothers' residence for each proximity definition. According to Table 1, mothers who live in a geographically close distance to their mothers or mothers-in-law are more likely to have a primary education degree but less likely to complete tertiary education. We observe a similar pattern in their partners' education. Women who live close to either mother or mother-in-law have a weaker labor force attachment, tend to have younger children, and are less likely to have older children and have more traditional gender views. These statistics highlight the fact that there is selection in these groups, i.e., residential location choice depends on the observed and unobserved characteristics of mothers. Therefore, we address the endogeneity problem in our empirical strategy using the IV estimation method by employing the number of alive grandmothers as an instrument for proximity.

In Table A5, we present descriptive statistics by the number of available grandmothers, our instrument. In addition to differences in educational outcomes and number of children, we see a substantial difference in mothers' average age across the groups. In our estimation, we address this problem by controlling age-fixed effects.

4 The Empirical Methodology

We estimate the impact of grandmothers' proximity on mothers' labor force participation and employment decisions using an instrumental variables approach as the residential choice is endogenous. Grandmothers' choice of residence and mothers' labor supply decisions might affect each other. The mother or mother-in-law of a woman who is already working may move close by to share the burden of housework and childcare, which would create a positive bias in a simple linear probability model. On the other hand, family structure and labor force participation are related to each other. In more traditional families, there is a lower probability that women will participate in the labor market and a higher likelihood that they will prefer to stay close to their mothers or mothers-in-law, which will generate a negative bias. Therefore, the overall direction of the bias is ambiguous.

We examine the impact of grandmothers' proximity by using the following model:

$$L_{igr} = \psi + \alpha P_i + \gamma_g + \phi_r + X_{igr}'\beta + \varepsilon_{igr} \quad (1)$$

where L_{igr} is the labor market outcome of the individual i at age g and raised in childhood

region r . P_i is a binary variable that takes value 1 if individual i 's mother and/or in-law lives close, as defined in the previous section. γ_g is age fixed effects and ϕ_r stands for childhood region (region the individual lived longest until the age of 15) fixed effects. X_{igr} is a vector of all other control variables in the model, including education categories fixed effects for both spouses, whether the spouse works, the current region fixed effects, type of the childhood settlement fixed effects, whether self or spouse has a chronic illness, presence of preschoolers in the household, presence of an older child, the number of children aged 10 years or below.²⁴ The coefficient α captures the effect of the grandmother's proximity on the mother's labor market outcome, and ε_{igr} represents the error term.

In our analysis, we use the number of grandmothers alive as an instrument for grandparents' proximity. To account for any dependence at the regional level, we cluster standard errors at the region of childhood residence (NUTS2, 26 Regions) by age level.²⁵

Education is defined as four dummy variables representing primary education, secondary education, tertiary education, and baseline category which corresponds to primary school or less. The husband's income and employment status tend to be correlated with the labor supply decision of married women through assortative mating or income effect. The rising income of the spouse might generate an income effect and motivates household members to withdraw from the labor market; therefore, we include the husband's educational attainment level as a proxy for his income (Maurer-Fazio et al., 2011).

Older women tend to have deceased parents and a weak labor force attachment because of severe health diseases. If the woman's age is not controlled properly, our instrument may not satisfy the exclusion restriction assumption. Therefore, we include women's age-fixed effects as controls in our estimation. Similarly, by using a set of dummy variables for women's region of childhood (NUTS-2 level) and type of childhood settlement, we aim to capture differences in family structure and attitudes towards women's working across regions. In order to control for the differences in labor market opportunities and availability of childcare providers, dummy variables for the region of residence (NUTS-1 level) are included in the analysis.²⁶

There is also a possibility that grandmothers(in-law) lives close to provide care to daughter(son) having health problems. To take this channel into account, we use a dummy variable indicating whether the woman or her spouse has chronic illnesses. Finally, we include an indicator variable for the presence of a child aged 15 and above in the household who might share the burden of childcare duties and two additional variables measuring childcare cost, e.g., the number of children

²⁴Our main results are robust to controlling for age at first marriage, age of the youngest child in the family, or the close proximity to sister or sister-in-law.

²⁵Additionally, we cluster standard errors at the current province and age level as an alternative specification of the model and present results in Table A6 which are very similar to our baseline results.

²⁶The information on the region of residence is only available at the NUTS-1 level.

10 years old or below and whether the youngest one is under 6.

We further discuss the validity of our instrument and robustness of our results when there is a relaxation of the exclusion restriction in Section 8.

4.1 Characteristics of Compliers

In our analysis, IV estimates capture the local average treatment effect (LATE), for women whose proximity to grandparents depends on the existence of grandmothers (compliers), while the OLS captures the average effect of short-distance grandparents. Living close to the mother or mother-in-law is a joint decision of the mothers and grandmothers. Therefore, it is hard to expect that the instrument is randomly assigned to the treatment. First, mothers of higher socioeconomic status might have preferences such that they prefer living further away from their mother or in-law and never use grandparental childcare (never takers). Second, compliers are mothers who live close to a grandmother when the grandmother is alive and, do not live close to her if the grandparent is not alive. Always takers and defiers do not exist. Therefore, LATE equals the average treatment effect on the treated (ATT).

We examine the observable characteristics of compliers relative to the overall sample to see whether the instrumental variable results can be generalized to the population. Table A7 presents the mean and variance of the covariates for the compliers, never takers and whole sample for each specification of the proximity variable.^{27,28} The estimated share of compliers is about 37%, whereas never takers account for 63% of the sample if the proximity variable is defined as living in the same district or closer. Compared to the overall sample, the subgroups of compliers are less likely to have a college education and more likely to have no schooling. Similarly, their partners are less educated. The complier group of women is also more likely to have village type of childhood regions and adhere to more traditional gender roles than women in the whole sample.

We also want to examine whether the complier group mainly consists of women who have decided to live where they were born or where their partner was born. Table A7 also presents the descriptive statistics of two variables, “woman/husband lives in the childhood region” where the variables take the value one if the woman/husband lives in the same childhood region and zero otherwise. However, we have to note that although we have the information of the current name of the province where the woman/husband lived longest *until the age of 15*; we observe their current

²⁷We use the `ivdesc` package in STATA by Marbach and Hangartner (2020) to estimate the statistics.

²⁸The method assumes that both the treatment variable and instrument are binary. Therefore, we split the instrument indicator into two groups: women whose mother or mother-in-law is alive and those with neither of them available.

region of residence at NUTS-1 level²⁹ unless they live in three major provinces which are Istanbul, Ankara and İzmir. The table shows that among compliers, almost 81.3% of women currently live in the NUTS-1 region where they lived longest until the age of 15. The average values presented here are interpreted as upper bound values since the respondent is considered not to move even if she switched to another city located in the same NUTS-1 region. Regarding the husbands' hometown, the sample mean is highest for women in the complier group.

Overall, mothers in the complier group are less educated, have less educated husbands, more likely to have traditional gender views, and more likely to live either in their home region or their husbands' home region. In addition, the share of women who moved to different regions from their parents or parents-in-law is higher in never-takers than compliers group, implying that demand for grandparental support is lower among household movers.³⁰ These patterns, considering the channels through which the proximity can affect mothers' labor supply, make it hard to compare the LATE and the average treatment effect(ATE). As the compliers group consists of women of low socioeconomic status, their reservation wage would be more sensitive to the cost of formal childcare and benefit more from free childcare. On the other hand, women in the compliers group are more likely to grow up in villages and more likely to be exposed to traditional gender attitudes, which may reduce their labor supply. Similarly, they are more likely to live in home regions which may increase demand for their elderly care services, which, again, is expected to decrease their labor supply. Therefore, only if the childcare channel dominates traditional gender norms and elderly care channels, LATE would be larger than ATE.

In the next section, we present our main results.

5 Results

5.1 Main Results

We estimate the equation 1 separately for each definition of proximity variable, “District” , “Town” and “City” and present the results in Table 2. In columns (1) and (3), we present ordinary

²⁹Turkey has 12 NUTS-1 regions, 24 NUTS-2 sub-regions and 81 NUTS-3 provinces. The NUTS-1 regions are Istanbul Region (TR1), West Marmara Region (TR2), Aegean Region (TR3), East Marmara Region (TR4), West Anatolia Region (TR5), Mediterranean Region (TR6), Central Anatolia Region (TR7), West Black Sea Region (TR8), East Black Sea Region (TR9), Northeast Anatolia Region (TRA), Central East Anatolia Region (TRB), Southeast Anatolia Region (TRC).

³⁰As an additional analysis to characterize the compliers, we divide the sample into different groups with respect to the basic characteristics and estimate our first-stage regression specification. Table A8 presents these results. Each panel of the table presents the coefficients of the instrument in each subgroup for each proximity measure, a binary indicator taking value 1 for mothers and grandmothers living in the same district, town or city, respectively. These patterns show that the LATE is based on less educated women with less educated husbands who have traditional gender views and live in their or husband's home region.

least square estimation results where the outcome variables are labor force participation and employment, respectively. These results show that when proximity is defined as “City”, the longest distance definition, there is a positive and marginally significant association between proximity and the labor force participation rate and employment of married women with young children, and the size is around 2–3 ppt. However, the size of the association gets smaller and insignificant as the proximity variable indicates a shorter distance.

As we mentioned earlier, OLS results are biased due to endogeneity and reverse causality problems; therefore, these estimates do not provide any causal relationship. In order to get the causal effect of grandmothers’ geographical proximity on the mother’s labor market outcome, we use the number of alive grandmothers, 0, 1, or 2, as an instrument for their geographical proximity. In Table A9, we present the first-stage results. As Table A9 shows, the number of alive grandmothers is a strong predictor of grandparents’ proximity for each of its definitions. F-statistics are far larger than the acceptable threshold of ten (Staiger and Stock, 1994), which assures us that our instrument is sufficiently strongly correlated with the endogenous variable, grandmothers’ geographical proximity.

We present the IV results in the second and fourth columns of Table 2.³¹ These results suggest that grandmothers’ proximity has a positive and significant causal impact on mothers’ labor market outcomes. It increases the labor force participation and employment rate of mothers with young children by 18.2 ppt and 16.4 ppt, respectively if the mother or in-law resides in the same neighborhood/district/village or closer. The effect gets smaller as the proximity to grandparents gets farther. According to those results, OLS estimates seem to underestimate the impact of grandmothers’ geographical proximity on women’s labor force participation and employment. As the traditional family structure where women are less likely to work but prefer staying close to their mothers or in-laws is the most dominant family type in Turkey, the direction of the bias in OLS estimates is expected.

We also present the reduced-form effect of the number of alive grandmothers on the labor force participation and employment probabilities of women with young children in Table A2. These estimates imply that women whose mother or in-law is alive are around 3 ppt are more likely to participate in the labor market and be employed. The effect increases to 6 ppt if both of the grandmothers are alive. These results are slightly lower than the findings of Talamas (2020) and Khanna and Pandey (2021) that focus on coresiding mothers and grandmothers. Here, as our focus is on all mothers and grandmothers, a smaller effect is expected.³²

We also investigate whether proximity to own mother and proximity to mother-in-law have

³¹In Table A10 and A11, we present the coefficient of other control variables for labor force participation and employment, respectively.

³²We cannot analyze the sample of coresiding mother and grandmothers as they constitute only 10 percent of our sample.

similar effects on mothers’ labor market outcomes. Table A12 presents these results. In the first two columns, we present the results regarding the effects of own mothers’ proximity and, in the third and fourth columns, we present the results regarding the effects of mother-in-laws’ proximity on labor market outcomes of women with young kids. We find a relatively strong effect for the group of mothers living close to their own mothers which might be because of the fact that mothers are more likely to receive childcare transfers from their mothers than from mothers-in-laws, or own mothers might be less likely to impose restrictive norms.

5.2 Is it the Grandmothers’ Proximity or Availability?

In the previous section, we show that grandmothers’ proximity improves labor market outcomes of women with young kids. However, one may argue that our results capture the grandmothers’ availability rather than proximity. We check this hypothesis by computing sample-split estimates.³³ We construct three different samples. In the first sample, we only keep individuals whose mothers and/or mothers-in-law are living in the same district or a different city. In the second sample, we keep individuals whose mothers and/or mothers-in-law are living in the same town or different city, i.e. we dropped individuals living in the same district and same city with their mother or mothers-in-law. Finally, in the third sample, we keep individuals whose mothers and/or mothers-in-law are living in the same city or a different city. We illustrate which groups are included in each sample in the following table.

Grandmothers’ Location				
	Same District	Same Town	Same City	Another City
Sample 1	X			X
Sample 2		X		X
Sample 3			X	X

Our proximity variable is equal to one if the mother and mother-in-law live in the same district (town, city) and 0 otherwise. In each case, our control group is the same, those living in different cities than their mother and/or mother-in-law. The results for these samples are presented in different panels of Table A13. The first panel shows that those women who live in the same district with their mothers and/or mothers-in-law, compared to those living in a different city, are significantly more likely to be in the labor force and employed. On the other hand, for the women whose mothers or mothers-in-law live in the same town but different district (same city but different town), the coefficients are insignificant and relatively small. If grandmothers being available (i.e., alive) or not available (i.e., not alive) drive our results, rather their proximity, we would observe coef-

³³We would like to thank an anonymous referee for suggesting this analysis.

ficients in the same magnitude across different samples. Therefore, we argue that proximity to grandmothers drives our results.

6 Mechanisms

We show that the proximity of grandmothers has a positive causal effect on mothers' labor market outcomes. In this section, we investigate how three different mechanisms, childcare provision, traditional gender norms, and elderly care channels, we discussed in the Conceptual Framework section, contribute to these results.

6.1 Childcare Provision Channel

We argue that the most important channel that links proximity and mothers' labor market outcomes is the grandmothers' free and flexible childcare provision. First, we examine whether the childcare provision channel drives our results by restricting our sample to married mothers with children older than ten years old and married women without any children. If grandmothers' proximity affects mothers' labor market outcomes through their childcare provision, the effect in this sample should be small or nonexistent as the women's labor market participation decision in this sample does not depend on the availability of childcare. In the first two columns of Table 3 and Table 4, we present OLS and IV results where we use the number of grandmothers alive as an instrument for the grandmothers' proximity. Although the coefficients are positive when the proximity of grandmothers are instrumented, they are insignificant and much smaller relative to our main results (Table 2).

We then test the validity of childcare motivation by repeating the same analysis with the sample of fathers with children 10 years old or younger. Men are less likely to be involved in household or childcare activities in societies where the patriarchal structure dominates (as in Turkey). Thus, we expect that grandmothers' proximity would have either no effect or a smaller effect on fathers' labor force participation and employment probabilities. The results are presented in the third and fourth columns of Table 3 and Table 4 for labor force participation and employment, respectively. Our IV results confirm that grandmothers' geographical proximity does not affect either fathers' labor supply or employment probabilities. We also perform a reduced-form estimation for each of these samples (i.e., we estimate the direct effect of the number of grandmothers alive on the labor market outcomes of women without young children and fathers with young children). We present the results in Table A14. These results show that the direct impact of the number of alive grandmothers on the labor market outcome is negligible and statistically insignificant for these samples.

Grandfathers are less engaged in childcare activities than grandmothers (Hank and Buber, 2009); therefore, we expect very little or no impact associated with grandfathers' proximity to the labor market outcomes of mothers with young children. In the fifth and sixth columns of Table 3 and Table 4, we focus on our main sample, mothers with young children, but use grandfathers' proximity as an endogenous variable and the number of alive grandfathers as an instrument. Our results indicate that grandfathers' childcare transfer does not significantly affect daughters' labor market outcomes.³⁴ For this sample, we also perform a reduced-form estimation to examine the direct impact of the number of alive grandfathers on the labor market outcomes of mothers with young children. The last two columns of Table A14 present these results, showing that the number of alive grandfathers has literally no effect (the coefficients are around 0.009) on the labor market outcome of this sample.

Finally, we define an additional outcome variable that is equal to 1 if a woman reports housework and childcare as the primary reason for not working; this variable takes the value zero for those who are in the labor force, are seasonal workers, or report that their reason for not working is something other than childcare and household chores. Almost 85 percent of married women with young children in the TFSS data set state that they are out of the labor market because they engage in housework activities. Therefore, we conduct the same analysis using this new variable to see if women's reason for not working changes with the proximity of grandmothers for each group of women *with* and *without* young children in Table A15. These results show that for the sample of women with young children, the proximity of grandmothers decreases their probability of stating childcare as a reason for not working. The coefficients are negative for women without young children but are much smaller and not statistically significant. These falsification checks support our hypothesis that childcare availability links grandmothers' geographical proximity and mothers' labor market outcomes.

6.2 Traditional Gender Norms Channel

In this section, we examine the effects of grandmothers' proximity on mothers' traditionalism and religiosity to understand whether it has any effects on our main results. We use four variables defined in Data section. Namely, we use "Having Son Preference", "Finding Women's Working Inappropriate", "Not approving the Interfaith Marriage" and "Traditionality Index" that we constructed by using all the variables that are used to construct traditionality and religiosity variables.³⁵

³⁴In our sample, 29 percent of grandfathers live in the same district, 56 percent live in the same town, and 69 percent live in the same city as their daughters(in-laws). The correlation between the grandmothers' and grandfathers' proximity is 75 percent ($p < .001$) for the shortest proximity definition, and 71 percent ($p < .001$) and 68 percent ($p < .001$) for the medium and longest proximity definitions.

³⁵The minimum value of the traditionality index is 0, the maximum value is 1.92.

In Table 5, we present the effects of grandmothers' proximity on these four variables for total sample as well as for the sample of women who have grown up in villages and non-villages (city and district center). We also report the p-values adjusted for multiple hypothesis testing, using (Simes, 1986). The results for the total sample show that grandmothers' proximity does have a significant effect on traditionality variables except "Not approving the Interfaith Marriage".

Table A3 show that women in our sample whose childhood regions are village areas are more likely to have traditional gender views relative to women who have grown up in non-village areas. Therefore, we divide our sample according to the type of the childhood region settlement to investigate heterogeneity in different samples. The results presented in columns (2) and (3) of Table 5 show that grandmothers' proximity increases the probability to have son preference, finding womens' working inappropriate³⁶, not approving the interfaith marriages and traditionality index for the sample of women who have grown up in villages. However, for the women who have been raised in city or district centers, the estimated coefficients are both small and not statistically significant. Overall, the results presented in Table 5 show evidence that "traditional gender view channel" is an important factor for the women raised in villages. Therefore, we expect that the results for labor outcomes of women who have grown up in city or district samples would reflect grandmothers' childcare provision, while the results for village subsample will be the net effect of childcare provision and traditional gender norms channel that are going in opposite directions.

We also investigate the differential effects of grandmothers' proximity on traditionality variables in the subsample of mothers with a child aged 0 to 5 (i.e., a preschool-age child), and with a school-age child, aged 6 to 10. The gender norm cost associated with working of mothers of children aged 0-5 might be higher, as prevalent gender norms support the view that women's primary responsibility is childcare and household chores. In other words, working while having a child who needs extensive childcare might be less accepted culturally. We present these results in Table 6. The evidence shows that grandmothers' proximity significantly affects mothers' traditional gender views for the mothers with children 5-years-old or younger. However, for the mothers with children aged 6 to 10 years old coefficients are on the opposite sign. Therefore, for mothers with a child aged 0 to 5, we expect traditional gender view channel to work in to opposite direction to reduce the grandmothers' childcare provision which can improve their labor market outcomes. In Table 6, we also repeat the same exercise according to mothers' education level and house ownership status.³⁷ The results for different education levels do not provide any significant and

³⁶The p-value of the test for significance of each proximity variable is 0.13.

³⁷Estimates of the proximity variable when it is defined as living in the same district or closer are not reported for the group of mothers who have at least college degrees, as F-statistics are small.

consistent pattern.³⁸ Similarly, the estimates according to the house ownership does not provide any significant results.

Finally, we investigate whether the proximity to mothers and mothers-in-law differentially affects women's own perceptions of traditionality and religiosity. We present the results in Table A16. The only significant effect we observe is the positive effect of own mother on "Not approving the Interfaith Marriage". When we examine the effects on traditionality index, we observe that the effects of own mother's proximity and mother-law's proximity are both small and insignificant. Therefore, we cannot detect substantial differences in terms of the differential effects of own mother or mothers-in-law on traditionality variables, which suggest that our differential findings for mothers' or mothers-in-law's proximity on labor market outcomes are not driven by their differential effects on traditionality.

6.3 Elderly Care Channel

In this section, we investigate whether the proximity of grandmothers' proximity affects mothers' labor market outcomes through the elderly care channel by implementing two different analyses. In our first analysis, we focus on the differential effect of grandmothers' proximity on women with at least one surviving sister or sister-in-law.³⁹ That is, we implement regression analysis in which we include the original proximity variable and its interaction with the presence of the sister(in-law) as endogenous variables. By doing so, we aim to understand if the positive effects of living close to grandmothers differ depending on the availability of a sister or sister-in-law. More specifically, we define a "Sister (Sister-in-Law)" variable that is equal to one if the individual has at least one surviving sister (sister-in-law). The instrument we use is the interaction of the dummy variables indicating whether the mother(mother-in-law) is alive and "Sister (Sister-in-Law)" variables.

In Table 7, we present these results for labor market outcomes for total, village, and non-village samples. The results in the first three panels, which are for the own mother and sister, show that the coefficients of the interaction term are insignificant but positive for the total, village, and non-village samples. The positive coefficients on the interaction term imply that having at least one sister increases the effects of grandmothers' proximity on mothers' labor force participation and

³⁸Although, the estimated coefficients are positive for traditionality index for at least college educated women, the effects on Finding Women's Working Inappropriate is negative. Therefore, these results do not provide any consistent evidence.

³⁹In our data, we do not observe information on the number of siblings or whether the sibling is older or younger. We only have the information of whether the woman or her husband has at least one sister or brother and if they live close by. That is, if the woman states that she lives far away from her sister, she might have another sister living close by but not mentioned in the questionnaire. Therefore, heterogeneity analysis grouping by the siblings' proximity will be problematic. We also do not have information regarding grandparents' health and whether the women provide any elder care to them unless they live in the same household.

employment rate. This result might be generated by sisters' help with elderly care or childcare. However, when we examine the effects of the mother-in-law's proximity when there is at least one sister-in-law, as presented in the last three panels, the coefficients are negative and significant. This suggests that women with at least one sister-in-law are less likely to benefit from grandmothers' proximity to join the labor market. If mother-in-laws' proximity affects mothers' labor supply through the elderly care channel, women with at least one sister-in-law would share the burden of elderly care and provide fewer hours of care, which would increase the labor supply of women. Overall, these results do not provide evidence that the proximity of grandmothers' does not affect daughters' LFP through the elderly care channel.

Second, inter-generational coresidence is an important determinant of elderly caregiving (Pezzin and Schone, 1999), and coresidence with an elder care recipient reflects increasing care demands (Heitmueller, 2007). Autaç (1998) and Aykan and Wolf (2000) show that in Turkey, coresidence primarily reflects the traditional pattern of care for elderly parents. Therefore, we exclude individuals in coresidency from our analysis to check its effects on our results. The results in Table A17 show that the coefficients increased slightly for the shortest proximity definition, which shows that the possible effects of elderly care on our estimates are small. The results for other proximity definitions are consistent with baseline estimates.

Overall, our results on mechanisms show that elderly care channel does not have potential to have significant impact on our results. However, traditional gender norm channel might be important especially for women who have raised in village areas. In the next section, we investigate the heterogeneity of the main results by taking into account our results in this section.

7 Heterogeneity of Results

Having established the causal relationship between grandmothers' geographical proximity and mothers' labor market outcomes, we would like to investigate the heterogeneity of our results. We, first, divide our sample according to the type of childhood region, village or non-village. We expect to find that women who grew up in village areas differ from those who grew up in city or district centers in terms of background characteristics, such as their mother's working status or the culture they were exposed to during their childhood. Table 8 shows that proximity to mothers or mothers-in-law has a positive impact on the labor force participation rate and employment of married women with young children who have grown up in a city or district center.⁴⁰ However, the effect is considerably smaller and insignificant for those who have grown up in a village. We attribute this difference to the differences in traditional gender norms mothers have been exposed

⁴⁰The p-values of the test for significance of the proximity variable "District" is 0.11 for the outcome variable "Employment". They are 0.12 for other definitions of proximity variable.

to if their mother or mother-in-law live in close proximity (see Table 5).

Second, we divide our sample into two categories by the presence and age of the youngest child in the household: mothers with a child aged 0 to 5 (i.e., a preschool-aged child), and with a school-age child, aged 6 to 10. One may expect to find that childcare impact declines as the child ages, on the other hand, the gender norm cost associated with working of mothers of children aged 0-5 might be higher.⁴¹ The results presented in Table 8 show that the effect of grandmothers' availability on the labor supply and employment status of mothers with children aged 0-5 is smaller in size relative to mothers with older children. This might be because school-age kids need less intensive childcare, which increases the likelihood of getting grandmothers' help. In addition, as we have provided evidence in the previous section (see Table 6), for the mothers of children aged 6-10,⁴² it might be more acceptable to work culturally.

Third, we investigate the impact of grandmothers' proximity according to the educational attainment of mothers. We divide our sample into two groups: those who have (at most) secondary education degrees and those who have at least a college degree. In the previous section, we could not find differential effects of grandmothers' proximity on mothers' traditionality measures by education level. However, as discussed in Section 2, if grandmothers' proximity only affects mothers' labor market outcomes through childcare transfer, we expect the childcare channel to be stronger for women with lower levels of education as free childcare would result in a greater percentage increase in the reservation wage.⁴³ Therefore, considering these two channels, we expect to find larger effect for women with lower education. As we expected, Table 8 shows that the effect of grandmothers' proximity on labor force participation is pronounced only for women with at most secondary education degrees.

We also report the estimated effect of grandmothers' geographical proximity for two different groups; these groups are divided in terms of the ownership status of the houses in which families are living. The first group is the "owner" status of the house, and the second group consists of tenants living in lodging or those who are not the owner of the house but also not paying rent. We see that the effect of proximity is smaller in magnitude and not significant for mothers residing in their own homes, unlike the second category of women who are probably in a lower income group or feel less constrained about switching their residences and prefer to stay close to their mother or in-laws.

Finally, we check the heterogeneity of the results according to women's traditionality index.

⁴¹Reflecting these views, in 2015, the Minister of Health at the time was quoted saying "Mothers should not put any career other than motherhood at the center of their career" (Akyol and Okten, 2019)

⁴²In the sample of mothers with children aged 0-5, the p-values of the test for significance of the proximity variable is 0.10 in the fourth column. In the sample of mothers with children aged 6-10, it is 0.11 when proximity is defined as the same city or closer, 0.12 for other proximity measures in the second column.

⁴³In Turkey, women with lower education deprived of ungenerous working conditions (Uraz et al., 2010).

We define women with a traditionality index above the median as conservative, and women with a traditionality index below the median as non-conservative. The results presented in Table 8 show that the results are larger and more significant for the sample of non-conservative women. These results highlight the importance of traditional gender norms.

We also repeat our heterogeneity analysis using the total sample instead of focusing on different samples by running a regression on the interaction of the group dummy and proximity. These results are presented in Table A18. Although the coefficients of interactions are less precisely estimated, they are large and in the same line, as we presented in this section.

8 Robustness Checks

In this section, we present several analyses to test the robustness of our results.

8.1 Violation of Exclusion Restriction

As our paper's main results hinge on the instrument's validity, we test the robustness of our results to violations of the exclusion restriction assumption by using the imperfect instrumental Variable (IIV) method proposed by Nevo and Rosen (2012) and the plausible exogeneity test by Conley et al. (2012). We present the details of the implementation of these methods in Online Appendix B. By using IIV method by Nevo and Rosen (2012), we show that for all proximity definitions, the IV estimates are located in the confidence intervals generated under the assumption that the instruments is less correlated with the error term than the original endogenous variable. Therefore, our results are robust to violations of the exclusion restriction.

We also apply the "plausibly exogenous" technique by Conley et al. (2012) to show how large a potential direct effect of the instrument can be to turn the 2SLS estimate of labor force participation and employment outcomes insignificant. We find that our results on labor market outcomes are significant as long as some omitted variable that is also captured by the number of alive grandmothers explains less than a quarter of the overall reduced form effect, which we argue is a large enough direct effect to ensure the robustness of our main results.

8.2 Alternative Specifications and Samples

In this section, we present additional analysis to check the robustness of our results to alternative specifications and samples. First, we check the robustness of our results by dropping the potentially endogenous variables from our analysis. Particularly, we drop the following variables: i) whether there is at least 1 child aged 0–5, ii) whether there is an older sibling, iii) the number of

young children in the household. We present the results in Table A19. While the coefficients are slightly smaller in magnitude, our results are robust to the exclusion of the potential endogenous variables listed above.

Second, we changed our estimation sample by focusing on mothers with children aged 0–9 and 0–11 to show that our results are robust to the age cutoff. As Table A20 shows the effect of proximity is positive and significant across different cut-off age levels.^{44 45}

One may argue that the reason why mothers are staying out of the labor market might be their poor health conditions. In that case, they may prefer to stay close to grandmothers to share the burden of housework or childcare activities, leading to a downward bias in our IV estimates. Therefore, we restrict our sample to mothers without chronic illnesses. Table A20 shows that, as expected, the coefficients increase slightly relative to the baseline results, and they are all significant.

We further check the robustness of our results by changing the definition of the instrumented and instrumental variables. In the first analysis, we change the proximity variable to the number of grandmothers in a close distance, while the instrumental variable is the same as the baseline regression, the number of grandmothers alive. The estimated coefficient and Wald F-statistics are reported in Table A21. The results show that having either grandmother a short distance away increases the mother's labor force participation and employment probability by 4–12 ppt, almost half of our baseline estimates. In the second analysis, we keep the proximity variable as in the baseline model (i.e., equal to 1 if at least one grandmother lives close) but we consider two different instruments for the proximity variable. We define two different instruments by using the information on whether maternal and paternal grandmothers are alive. The results of this specification are also consistent with our main results. Having multiple instruments for a single endogenous variable requires one to perform an over-identification test. The joint null hypothesis that the instruments are valid and that the excluded instruments are correctly excluded from the estimated equation is not rejected by Hansen J statistics. In the final analysis, we define proximity as the number of grandmothers in close distance and specify two instruments indicating whether maternal and paternal grandmothers are alive. That is, proximity is defined as in Analysis 1, and the instruments are defined as in Analysis 2. The estimated effects from this specification remain similar to those obtained in the previous analysis, showing that our results are robust to different specifications.

⁴⁴For the sub-sample of mothers with children aged 0–9, for the outcome variable of employment, the p-value of the test for significance of each proximity variable is 0.11.

⁴⁵The estimates for the key variable of interest from the main sample and sub-sample of mothers with children aged 0-9 are not statistically different.

8.3 Sample Selection

Another important concern is that women living close to grandmothers might affect women's fertility behavior, resulting in selection into our main analysis sample, which will bias our results. To see if our findings are influenced by sample selection bias, we focus on all married women sample and estimate the effects of proximity on having at least one young child (aged 0-10). The results presented in the first column of Table A22 show that the grandmothers' proximity does not significantly affect having at least one young child. We also investigate the effects of grandmothers' proximity on the number of young children in our main estimation sample, married women aged 18–50 years old with at least one young child. The results presented in the second column of Table A22 show that grandmothers' proximity does not have significant effects on the number of young children. Therefore, we can conclude that our results do not suffer from sample selection bias.

9 Conclusion

Female labor force participation is an essential driver of women's well-being and the well-being of the economy they live in, yet, in many countries, it continues to stay at low levels. There are several factors, such as access to childcare, education level, and cultural and gender norms, that can affect women's labor supply decisions. In this paper, we investigate the effects of geographical proximity to grandmothers on the labor supply decisions of women with young children using the Turkish Family Structure Survey data set. Unlike regular childcare, being close to grandmothers can increase women's labor market participation through free and flexible childcare, which can also be considered an insurance mechanism. However, at the same time, grandmothers living at a close distance can impose the traditional gender norms that are prevalent in the population, or grandmothers living in close proximity may require elderly care, which would decrease women's labor market participation. Therefore, the direction of the effect is ambiguous.

We use an instrumental variable approach to control for the potential endogeneity that arises if the labor force participation decision of women determines grandmothers' choice of residence or vice versa, and if the unobserved family characteristics affect women's decision to work.

We find that living in the same neighborhood or closer to a mother or mother-in-law increases women's labor force participation and employment rate by 18.2 ppt and 16.4 ppt, respectively. We also show that when we extend proximity measures to the same town or closer and the same city or closer, the effects are reduced to 13.6 ppt and 12.3 ppt for labor force participation, respectively, and reduced to 13.2 ppt and 11.9 ppt for employment outcomes, respectively. We investigate three potential channels—childcare, elderly care, and traditional gender norms channels—that can link grandmothers' proximity to mothers' labor market outcomes.

We show that for women with no children or only older children, and for fathers with young children whose primary responsibility does not include childcare activities, the proximity of grandmothers does not have any significant effect on their labor market outcomes. We also find that grandfathers' proximity does not affect the labor market outcomes of women with young children. These results show that grandmothers' proximity affects the labor market outcome of mothers with children through their childcare provision. We also examine the effects of grandmothers' proximity on traditionality, and find that grandmothers' proximity has a significant and positive impact on the traditionality of women who have been raised in villages. Finally, we show that the elderly care channel does not affect our main results. Therefore, we argue that grandmothers' proximity affects mothers' labor market outcomes through childcare and traditional gender norm channels.

Our heterogeneity results reveal that our main results are driven by women with at most secondary education, and the results are stronger for women who have been raised in non-village areas. Highlighting the impact of traditional gender norms channel, we could not find a significant result for women who have been raised in villages, and for women who have conservative gender norms.

Our results suggest that government policies that promote affordable, quality, and accessible childcare services provided either by formal or informal institutions have the potential to increase the labor force participation of women who are at risk of withdrawing from the labor market. However, these policies are less likely to work in rural settings; therefore, policies should be designed considering their interaction with existing gender norms.

Table 1: Descriptive statistics by grandmothers' geographical proximity

	District		Town		City	
	Distant	Close	Distant	Close	Distant	Close
Labor force participation	0.273 (0.446)	0.209 (0.407)	0.265 (0.441)	0.242 (0.428)	0.269 (0.444)	0.245 (0.430)
Employment	0.259 (0.438)	0.199 (0.399)	0.255 (0.436)	0.228 (0.420)	0.256 (0.437)	0.232 (0.422)
Age	34.090 (6.303)	32.792 (6.194)	34.658 (6.489)	33.072 (6.119)	34.782 (6.637)	33.296 (6.157)
Primary school or less	0.430 (0.495)	0.544 (0.498)	0.435 (0.496)	0.490 (0.500)	0.431 (0.496)	0.482 (0.500)
Primary education	0.169 (0.375)	0.198 (0.398)	0.164 (0.370)	0.187 (0.390)	0.160 (0.367)	0.185 (0.388)
Secondary education	0.190 (0.392)	0.159 (0.366)	0.180 (0.384)	0.178 (0.383)	0.165 (0.371)	0.183 (0.386)
Tertiary education	0.212 (0.409)	0.100 (0.299)	0.221 (0.415)	0.145 (0.352)	0.244 (0.430)	0.151 (0.358)
Primary school or less (Husband)	0.309 (0.462)	0.426 (0.495)	0.312 (0.464)	0.372 (0.484)	0.314 (0.465)	0.362 (0.481)
Primary education (Husband)	0.140 (0.347)	0.203 (0.402)	0.124 (0.329)	0.183 (0.387)	0.116 (0.32)	0.176 (0.381)
Secondary education (Husband)	0.241 (0.428)	0.239 (0.426)	0.209 (0.407)	0.257 (0.437)	0.183 (0.387)	0.256 (0.437)
Tertiary education (Husband)	0.310 (0.463)	0.132 (0.339)	0.355 (0.479)	0.188 (0.391)	0.387 (0.487)	0.206 (0.405)
Employed (Husband)	0.932 (0.252)	0.886 (0.318)	0.927 (0.260)	0.909 (0.288)	0.932 (0.251)	0.910 (0.286)
Childhood Region:Center	0.398 (0.490)	0.318 (0.466)	0.348 (0.477)	0.380 (0.486)	0.355 (0.479)	0.373 (0.484)
Childhood Region:District	0.322 (0.467)	0.269 (0.444)	0.324 (0.468)	0.291 (0.454)	0.321 (0.467)	0.298 (0.457)
Childhood Region:Village	0.280 (0.449)	0.413 (0.493)	0.328 (0.470)	0.328 (0.470)	0.325 (0.469)	0.329 (0.470)
Child aged 0_5 in the household	0.653 (0.476)	0.678 (0.467)	0.626 (0.484)	0.681 (0.466)	0.606 (0.489)	0.677 (0.468)
Child aged 15 and above	0.216 (0.412)	0.210 (0.407)	0.244 (0.430)	0.198 (0.399)	0.257 (0.437)	0.202 (0.402)
Number of young children	1.523 (0.692)	1.657 (0.796)	1.510 (0.687)	1.604 (0.756)	1.481 (0.677)	1.597 (0.748)
Son Preference	0.296 (0.456)	0.410 (0.492)	0.314 (0.465)	0.349 (0.477)	0.332 (0.471)	0.338 (0.473)
Finding Women's Working Inappropriate	0.082 (0.274)	0.088 (0.283)	0.081 (0.273)	0.086 (0.280)	0.083 (0.276)	0.084 (0.278)

Interfaith Marriage is not Allowed	0.490 (0.500)	0.554 (0.497)	0.502 (0.500)	0.520 (0.500)	0.506 (0.500)	0.516 (0.500)
Traditionality Index	0.420 (0.453)	0.541 (0.501)	0.434 (0.452)	0.480 (0.485)	0.456 (0.476)	0.466 (0.474)
Lives in childhood region	0.628 (0.484)	0.814 (0.389)	0.474 (0.500)	0.812 (0.391)	0.308 (0.462)	0.803 (0.398)
Husband childhood region	0.656 (0.475)	0.847 (0.36)	0.512 (0.500)	0.838 (0.369)	0.357 (0.479)	0.828 (0.378)
Only one grandmother alive	0.221 (0.415)	0.152 (0.359)	0.247 (0.432)	0.169 (0.375)	0.248 (0.432)	0.181 (0.385)
Both grandmothers alive	0.738 (0.440)	0.848 (0.359)	0.677 (0.468)	0.831 (0.375)	0.632 (0.482)	0.819 (0.385)
Only one grandfather alive	0.324 (0.468)	0.341 (0.474)	0.337 (0.473)	0.327 (0.469)	0.345 (0.476)	0.326 (0.469)
Both grandfathers alive	0.576 (0.494)	0.559 (0.497)	0.543 (0.498)	0.584 (0.493)	0.522 (0.500)	0.583 (0.493)
Observations	2,256	1,286	1,221	2,321	770	2,772

Source: Family Structure Survey Micro Data Set 2016. The standard deviations are presented in parentheses.

Table 2: Effects of grandmothers' proximity on mothers' labor market outcomes

	<i>Dependent Variables</i>			
	MLFP		Employment	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	0.001 (0.013)	0.182** (0.080)	0.004 (0.013)	0.164** (0.079)
F statistic:		121.126		121.126
Same town or closer				
Proximity	0.026** (0.013)	0.136** (0.060)	0.020 (0.013)	0.123** (0.060)
F statistic:		186.531		186.531
Same city or closer				
Proximity	0.030* (0.015)	0.132** (0.059)	0.030* (0.016)	0.119** (0.058)
F statistic:		213.617		213.617
Observations				3,542

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Mean of MLFP and Employment is 0.250 (0.433) and 0.237 (0.426). Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (province center (omitted), district center and sub-district or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least 1 child aged 0–5, whether there is an older sibling, number of young children in the household. The Proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is 0. In columns 2, 4, and 6, the number of alive grandmothers used as an instrument. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10.

Table 3: Effects of grandparents' proximity on labor force participation of women without young children, fathers and mothers with young children

	<i>Dependent Variable: Labor Force Participation</i>					
	Women without young children		Fathers with young children		Mothers with young children	
	OLS	IV	OLS	IV	OLS	IV
Same neighborhood/district/village or closer						
Grandmother lives close	-0.010 (0.019)	0.075 (0.059)	-0.014*** (0.005)	-0.001 (0.029)		
F statistic:		321.186		137.925		
Same town or closer						
Grandmother lives close	-0.000 (0.017)	0.054 (0.042)	-0.012*** (0.004)	-0.001 (0.024)		
F statistic:		620.949		176.879		
Same city or closer						
Grandmother lives close	0.042** (0.019)	0.050 (0.039)	-0.010*** (0.004)	-0.001 (0.024)		
F statistic:		812.586		182.870		
Same neighborhood/district/village or closer						
Grandfather lives close					-0.014 (0.015)	0.047 (0.054)
F statistic:						333.590
Same town or closer						
Grandfather lives close					0.005 (0.013)	0.030 (0.034)
F statistic:						764.301
Same city or closer						
Grandfather lives close					0.004 (0.014)	0.028 (0.032)
F statistic:						942.015
Observations	2,509	2,509	3,408	3,408	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. The dependent variables are women's labor force participation, fathers' labor force participation, and mothers' labor force participation, respectively. The mean value of the dependent variable is 0.322 (0.467), 0.984 (0.124), and 0.250 (0.433) for the group of married women without young children, fathers with young children, and mothers with young children, respectively. Control variables are the same as the baseline estimation. For the first four columns, the instrumented variable: Mother or in-law lives close; the instrumental variable: Number of grandmothers alive. For the fifth and sixth columns, the instrumented variable: Father or in-law lives close; the instrumental variable: Number of grandfathers alive. The results of the sample of married women with children aged 11 and older or no children are presented in columns one and two. The results of the sample of fathers with children aged 10 and younger are presented in the third and fourth columns. The last two columns consider married women with young children.

Table 4: Effects of grandmothers' proximity on the employment status of women without young children, fathers and mothers with young children

	<i>Dependent Variable: Employment</i>					
	Women without young children		Fathers with young children		Mothers with young children	
	OLS	IV	OLS	IV	OLS	IV
Same neighborhood/district/village or closer						
Grandmother lives close	-0.009 (0.019)	0.065 (0.058)	-0.022*** (0.009)	0.025 (0.053)		
F statistic:		321.186		137.925		
Same town or closer						
Grandmother lives close	0.000 (0.017)	0.046 (0.041)	-0.025*** (0.008)	0.021 (0.044)		
F statistic:		620.949		176.879		
Same city or closer						
Grandmother lives close	0.038** (0.019)	0.043 (0.038)	-0.019** (0.009)	0.021 (0.045)		
F statistic:		812.586		182.870		
Same neighborhood/district/village or closer						
Grandfather lives close					-0.012 (0.014)	0.048 (0.054)
F statistic:						333.590
Same town or closer						
Grandfather lives close					-0.000 (0.013)	0.030 (0.034)
F statistic:						764.301
Same city or closer						
Grandfather lives close					0.002 (0.014)	0.029 (0.032)
F statistic:						942.015
Observations	2,509	2,509	3,408	3,408	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. The dependent variables are women's employment, fathers' employment, and mothers' employment, respectively. The mean value of the dependent variable is 0.297 (0.457), 0.937 (0.243), and 0.237 (0.426) for the group of women without young children, fathers with young children, and mothers with young children, respectively. Control variables are the same as the baseline estimation. For the first four columns, the instrumented variable: Mother or in-law lives close; the instrumental variable: Number of grandmothers alive. For the fifth and sixth columns, the instrumented variable: Father or in-law lives close; the instrumental variable: Number of grandfathers alive. The results of the sample of married women with children aged 11 and older or no children are presented in columns one and two. The results of the sample of fathers with children aged 10 and younger are presented in the third and fourth columns. The last two columns consider married women with young children.

Table 5: Effects of grandmothers' proximity on measures of traditionality by childhood region type

<i>Dependent Variables:</i>	Childhood Region Type		
	Total Sample	City or District Center	Village
Having Son Preference:			
District	0.071 (0.101) {0.616}	-0.043 (0.143) {0.999}	0.251* (0.151) {0.128}
Town	0.053 (0.075) {0.615}	-0.030 (0.100) {0.999}	0.190* (0.113) {0.125}
City	0.052 (0.074) {0.615}	-0.030 (0.101) {0.999}	0.189* (0.114) {0.126}
Mean dependent variable	0.337 (0.473)	0.300 (0.458)	0.414 (0.493)
Finding Women's Working Inappropriate:			
District	0.032 (0.063) {0.616}	-0.000 (0.084) {0.999}	0.132 (0.088) {0.134}
Town	0.024 (0.047) {0.615}	-0.000 (0.058) {0.999}	0.100 (0.065) {0.125}
City	0.023 (0.046) {0.615}	-0.000 (0.059) {0.999}	0.099 (0.065) {0.126}
Mean dependent variable	0.084 (0.278)	0.076 (0.264)	0.102 (0.302)
Not Approving the Interfaith Marriage:			
District	0.194* (0.111) {0.321}	0.100 (0.150) {0.999}	0.336** (0.151) {0.105}
Town	0.145* (0.082) {0.315}	0.070 (0.105) {0.999}	0.254** (0.113) {0.097}
City	0.141* (0.080) {0.312}	0.071 (0.107) {0.999}	0.253** (0.111) {0.094}
Mean dependent variable	0.514 (0.500)	0.469 (0.499)	0.605 (0.489)
Traditionality Index:			
District	0.055 (0.103) {0.616}	-0.088 (0.145) {0.999}	0.302* (0.157) {0.110}
Town	0.041 (0.077) {0.615}	-0.061 (0.101) {0.999}	0.228* (0.118) {0.105}
City	0.040 (0.075) {0.615}	-0.063 (0.103) {0.999}	0.227* (0.118) {0.108}
Mean dependent variable	0.464 (0.475)	0.407 (0.438)	0.581 (0.523)
Observations	3,542	2,380	1,162

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. P-values, adjusted for multiple hypothesis testing, are displayed in {curly brackets}. The first-stage F statistics are above 10.

Table 6: Effects of grandmothers' proximity on the indicators of traditionality for different subgroups

Age of the youngest children:	Subgroups											
	0-5						6-10					
	Traditionality Index			Finding Women's Working Inappropriate			Traditionality Index			Finding Women's Working Inappropriate		
	District	Town	City	District	Town	City	District	Town	City	District	Town	City
F statistic	0.232* (0.138)	0.184* (0.110)	0.209* (0.127)	0.076 (0.078)	0.061 (0.062)	0.069 (0.070)	-0.224 (0.168)	-0.153 (0.113)	-0.127 (0.094)	-0.002 (0.104)	-0.002 (0.071)	-0.001 (0.059)
Mean dependent variable	68.101			82.679			45.169			87.755		
Observations	2,345						1,197					
Educational Level:	Secondary School or Less						College and Above					
	Traditionality Index			Finding Women's Working Inappropriate			Traditionality Index			Finding Women's Working Inappropriate		
	District	Town	City	District	Town	City	District	Town	City	District	Town	City
F statistic	0.026 (0.105)	0.020 (0.082)	0.020 (0.080)	0.032 (0.063)	0.025 (0.049)	0.025 (0.048)	0.619 (0.653)	0.171 (0.154)	0.154 (0.137)	-0.119 (0.337)	-0.033 (0.093)	-0.030 (0.084)
Mean dependent variable	125.774			223.951			2.249			19.807		
Observations	2,936						606					
Ownership status of the house:	Owner						Not Owner					
	Traditionality Index			Finding Women's Working Inappropriate			Traditionality Index			Finding Women's Working Inappropriate		
	District	Town	City	District	Town	City	District	Town	City	District	Town	City
F statistic	0.056 (0.138)	0.040 (0.099)	0.039 (0.098)	-0.030 (0.091)	-0.021 (0.065)	-0.021 (0.065)	0.076 (0.172)	0.057 (0.128)	0.052 (0.119)	0.106 (0.100)	0.079 (0.074)	0.073 (0.068)
Mean dependent variable	74.456			144.794			41.993			75.185		
Observations	1,725						1,817					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Dependent variables are the traditionality index and finding it inappropriate women's working. Control variables are the same as the baseline estimation.

Table 7: Differential effects of grandmothers' proximity on mother's labor force participation and employment status for the group of women with sisters or sisters-in-law

	<i>Dependent Variables</i>					
	MLFP			Employment		
	District	Town	City	District	Town	City
Total Sample						
Mother's Proximity x Sister	0.158 (0.314)	0.055 (0.119)	0.036 (0.086)	-0.024 (0.297)	-0.014 (0.112)	-0.013 (0.080)
Mothers' Proximity	0.060 (0.284)	0.023 (0.111)	0.019 (0.081)	0.193 (0.264)	0.076 (0.103)	0.057 (0.075)
First stage F stat:						
Proximity	142.98	593.88	1228.47	142.98	593.88	1228.47
Proximity x Sister	254.39	1058.97	2190.39	254.39	1058.97	2190.39
Village Sample						
Mothers' Proximity x Sister	0.128 (0.428)	0.060 (0.200)	0.043 (0.144)	-0.203 (0.379)	-0.094 (0.177)	-0.069 (0.126)
Mothers' Proximity	-0.089 (0.402)	-0.043 (0.186)	-0.031 (0.139)	0.203 (0.348)	0.094 (0.160)	0.071 (0.119)
First stage F stat:						
Proximity	43.91	167.14	359.70	43.91	167.14	359.70
Proximity x Sister	97.82	271.48	559.33	97.82	271.48	559.33
Non-Village Sample						
Mothers' Proximity x Sister	0.129 (0.413)	0.015 (0.146)	0.006 (0.104)	0.134 (0.410)	0.020 (0.144)	0.011 (0.103)
Mothers' Proximity	0.350 (0.375)	0.123 (0.138)	0.093 (0.099)	0.289 (0.370)	0.101 (0.136)	0.076 (0.098)
First stage F stat:						
Proximity	82.17	409.57	843.42	82.17	409.57	843.42
Proximity x Sister	139.67	654.00	1370.25	139.67	654.00	1370.25
Total Sample						
Mother in Law's Proximity x Sister in Law	-0.492** (0.200)	-0.218** (0.090)	-0.166** (0.068)	-0.487** (0.197)	-0.216** (0.088)	-0.165** (0.067)
Mother in Law's Proximity	0.525*** (0.192)	0.240*** (0.085)	0.185*** (0.065)	0.511*** (0.189)	0.233*** (0.084)	0.180*** (0.064)
First stage F stat:						
Proximity	156.96	617.51	1393.84	156.96	617.51	1393.84
Proximity x Sister in Law	251.23	1146.37	2680.84	251.23	1146.37	2680.84
Village Sample						
Mother in Law's Proximity x Sister in Law	-0.436** (0.217)	-0.232** (0.117)	-0.189** (0.094)	-0.456** (0.228)	-0.241** (0.122)	-0.197** (0.099)
Mother in Law's Proximity	0.470** (0.206)	0.259** (0.109)	0.213** (0.089)	0.497** (0.218)	0.274** (0.116)	0.225** (0.094)
First stage F stat:						
Proximity	64.06	234.12	468.13	64.06	234.12	468.13
Proximity x Sister in Law	96.83	399.02	819.19	96.83	399.02	819.19
Non-Village Sample						
Mother in Law's Proximity x Sister in Law	-0.594** (0.278)	-0.253** (0.116)	-0.189** (0.087)	-0.574** (0.272)	-0.246** (0.114)	-0.185** (0.085)
Mother in Law's Proximity	0.572** (0.269)	0.243** (0.111)	0.182** (0.083)	0.529** (0.262)	0.224** (0.109)	0.169** (0.081)
First stage F stat:						
Proximity	101.10	456.37	960.59	101.10	456.37	960.59
Proximity x Sister in Law	177.83	805.69	1862.71	177.83	805.69	1862.71
Observations	3,542					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS2 childhood region-age level. Dependent variables are MLFP and employment status. In the first analysis, endogenous variables are the mothers' proximity and its interaction with the presence of at least one sister. Control variables are the same as the baseline estimation, except that for this analysis we include the presence of the sister as an additional control variable. In the second analyses, endogenous variables are the mothers-in-law's proximity and its interaction with the presence of at least one sister-in-law. First-stage F statistics are Sanderson-Windmeijer (2016) F statistics for multiple endogenous regressors. The corresponding Stock and Yogo (2005) critical value for 10% maximal IV size is 7.03.

Table 8: Effects of grandmothers' proximity on mother's labor force participation and employment status for different subgroups

Childhood Region Type:	Subgroups											
	City or District Center						Village					
	MLFP		Employment		MLFP		Employment		MLFP		Employment	
District	Town	City	District	Town	City	District	Town	City	District	Town	City	
	0.228**	0.159**	0.162**	0.178	0.124	0.127	0.110	0.083	0.083	0.134	0.101	0.101
	(0.112)	(0.078)	(0.081)	(0.113)	(0.079)	(0.081)	(0.111)	(0.084)	(0.083)	(0.108)	(0.081)	(0.080)
F statistic	64.947	108.175	107.548	64.947	108.175	107.548	49.583	94.528	114.823	49.583	94.528	114.823
Mean dependent variable		0.289			0.276			0.170			0.158	
		(0.453)			(0.447)			(0.375)			(0.365)	
Observations	2,380						1,162					
Age of the youngest children:	0-5						6-10					
	MLFP		Employment		MLFP		Employment		MLFP		Employment	
	District	Town	City	District	Town	City	District	Town	City	District	Town	City
	0.146*	0.116*	0.132*	0.139	0.110	0.125	0.228	0.156	0.129	0.187	0.128	0.106
	(0.087)	(0.068)	(0.079)	(0.086)	(0.068)	(0.078)	(0.147)	(0.099)	(0.082)	(0.143)	(0.096)	(0.079)
F statistic	68.101	97.917	82.679	68.101	97.917	82.679	45.169	87.755	145.847	45.169	87.755	145.847
Mean dependent variable		0.221			0.209			0.307			0.292	
		(0.415)			(0.407)			(0.461)			(0.455)	
Observations	2,345						1,197					
Educational Level:	Secondary School or Less						College and Above					
	MLFP		Employment		MLFP		Employment		MLFP		Employment	
	District	Town	City	District	Town	City	District	Town	City	District	Town	City
	0.207***	0.162***	0.158***	0.181**	0.142**	0.138**	-	-0.101	-0.091	-	-0.078	-0.070
	(0.075)	(0.059)	(0.057)	(0.073)	(0.057)	(0.056)		(0.216)	(0.193)		(0.228)	(0.204)
F statistic	125.774	188.162	223.951	125.774	188.162	223.951	2.249	15.538	19.807	2.249	15.538	19.807
Mean dependent variable		0.165			0.154			0.662			0.642	
		(0.371)			(0.361)			(0.474)			(0.480)	
Observations	2,936						606					
Ownership status of the house:	Owner						Not Owner					
	MLFP		Employment		MLFP		Employment		MLFP		Employment	
	District	Town	City	District	Town	City	District	Town	City	District	Town	City
	0.099	0.071	0.070	0.065	0.047	0.046	0.326**	0.244**	0.225**	0.315**	0.235**	0.217**
	(0.108)	(0.077)	(0.077)	(0.107)	(0.077)	(0.076)	(0.139)	(0.104)	(0.097)	(0.136)	(0.102)	(0.094)
F statistic	74.456	141.972	144.794	74.456	141.972	144.794	41.993	59.308	75.185	41.993	59.308	75.185
Mean dependent variable		0.257			0.246			0.243			0.229	
		(0.437)			(0.431)			(0.429)			(0.421)	
Observations	1,725						1,817					
Traditionality Index:	Non-conservative						Conservative					
	MLFP		Employment		MLFP		Employment		MLFP		Employment	
	District	Town	City	District	Town	City	District	Town	City	District	Town	City
	0.229*	0.158*	0.156*	0.197	0.136	0.134	0.129	0.102	0.099	0.123	0.097	0.094
	(0.132)	(0.092)	(0.091)	(0.131)	(0.091)	(0.090)	(0.096)	(0.076)	(0.073)	(0.094)	(0.075)	(0.072)
F statistic	54.564	88.708	94.026	54.564	88.708	94.026	72.384	110.916	145.524	72.384	110.916	145.524
Mean dependent variable		0.295			0.282			0.177			0.166	
		(0.456)			(0.450)			(0.382)			(0.372)	
Observations	2,187						1,355					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Dependent variables are MLFP and employment status. Control variables are the same as the baseline estimation.

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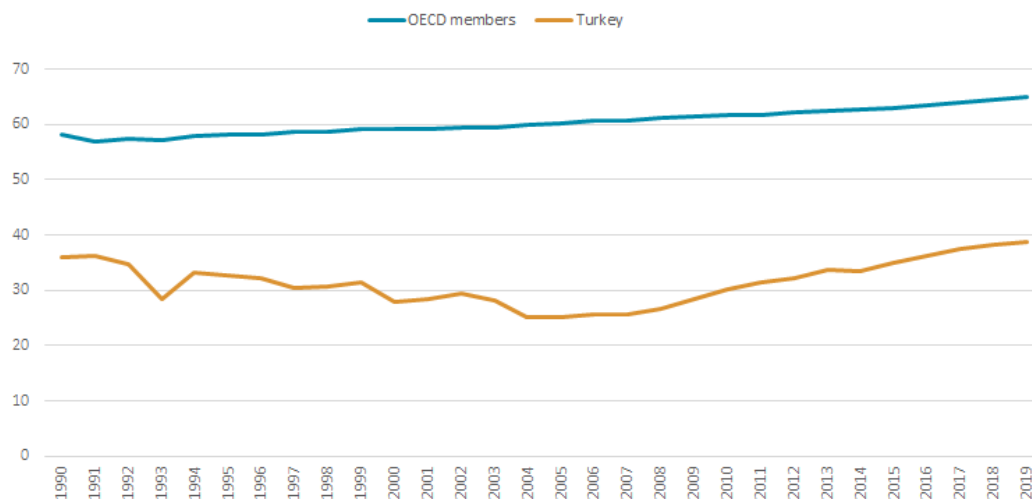
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10 Online Appendix A

Figure A1: Female Labor Force Participation in OECD Countries by years



Source:OECD

Table A1: Family Structure Survey Micro Data Set 2016

<i>The reason of not working</i>	<i>Observations</i>
Couldn't find job / unemployed and looking for job	579
Seasonal working	40
Continuing to education / training	1,484
Busy with housework (including care of children, elderly, ill etc. individuals)	9,246
Retired or left the job	607
Disabled or ill (unable to work)	202
Elderly (not retired, but thinking that he/she is too old to work, 60+)	126
Income owner	2
Family and personal reasons	203
Other	35
Total	12,524

Table A2: Effects of number of alive grandmothers on mothers' labor market outcomes

	<i>Dependent Variables</i>	
	MLFP	Employment
Number of grandmothers alive	0.031** (0.013)	0.028** (0.013)
Primary education	0.036* (0.019)	0.036* (0.019)
Secondary education	0.112*** (0.022)	0.108*** (0.022)
Tertiary education	0.521*** (0.028)	0.514*** (0.027)
Primary education (Husband)	0.015 (0.020)	0.008 (0.019)
Secondary Education (Husband)	-0.004 (0.018)	-0.003 (0.018)
Tertiary Education (Husband)	-0.019 (0.022)	-0.024 (0.021)
Employment (Husband)	-0.062** (0.025)	-0.022 (0.024)
District Center	-0.004 (0.016)	-0.008 (0.015)
Village	-0.007 (0.016)	-0.011 (0.015)
Chronic Illness	0.014 (0.017)	0.010 (0.017)
At least 1 child aged 0–5	-0.083*** (0.017)	-0.081*** (0.017)
At least 1 child aged 15 and above	-0.039* (0.020)	-0.035* (0.020)
Number of young children	-0.024** (0.010)	-0.021** (0.010)
Observations	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses.

Table A3: Traditionality index by childhood region type

<i>Variables</i>	<i>Village Born</i>	<i>Nonvillage Born</i>	<i>Difference</i>	<i>Whole Sample</i>
Son preference	0.414	0.300	-0.114***	0.337
Finding Women's Working Inappropriate	0.102	0.076	-0.026*	0.084
Interfaith Marriage is not Allowed	0.605	0.469	-0.136***	0.514
Traditionality Index	0.581	0.407	-0.173***	0.464
Observations	1355	2187		3542

Table A4: Effects of grandmothers' proximity on mother's labor force participation and employment status if unpaid family workers are included in the paid labor force and employment

	<i>Dependent Variables</i>			
	<i>MLFP</i>		<i>Employment</i>	
	<i>(OLS)</i>	<i>(IV)</i>	<i>(OLS)</i>	<i>(IV)</i>
Same neighborhood/district/village or closer				
Proximity	0.047*** (0.015)	0.171** (0.086)	0.050*** (0.015)	0.154* (0.085)
F statistic:		121.126		121.126
Same town or closer				
Proximity	0.065*** (0.015)	0.128** (0.064)	0.060*** (0.015)	0.115* (0.064)
F statistic:		186.531		186.531
Same city or closer				
Proximity	0.061*** (0.017)	0.124** (0.062)	0.062*** (0.017)	0.112* (0.062)
F statistic:		213.617		213.617
Observations				3,542

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Mean of MLFP and Employment is 0.304 (0.460) and 0.291 (0.454). Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (province center (omitted), district center and sub-district or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least 1 child aged 0–5, whether there is an older sibling, number of young children in the household. The Proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is 0. In columns 2 and 4, the number of alive grandmothers used as an instrument. The sample includes all married mothers aged 18–50 inclusive, with at least one child aged 0–10.

Table A5: Descriptive statistics by the number of alive grandmothers

	Number of Alive Grandmothers		
	0	1	2
Labor force participation	0.141 (0.350)	0.206 (0.405)	0.265 (0.441)
Employment	0.141 (0.350)	0.195 (0.396)	0.251 (0.434)
Age	40.576 (6.156)	36.692 (6.328)	32.613 (5.880)
Primary school or less	0.804 (0.399)	0.622 (0.485)	0.422 (0.494)
Primary education	0.098 (0.299)	0.130 (0.336)	0.194 (0.396)
Secondary education	0.065 (0.248)	0.135 (0.342)	0.193 (0.395)
Tertiary education	0.033 (0.179)	0.112 (0.316)	0.190 (0.393)
Primary school or less (Husband)	0.587 (0.495)	0.470 (0.499)	0.314 (0.464)
Primary education (Husband)	0.174 (0.381)	0.160 (0.367)	0.163 (0.369)
Secondary education (Husband)	0.174 (0.381)	0.200 (0.401)	0.253 (0.435)
Tertiary education (Husband)	0.065 (0.248)	0.170 (0.376)	0.271 (0.444)
Employed(Husband)	0.804 (0.399)	0.882 (0.323)	0.927 (0.260)
Childhood Region:Center	0.261 (0.442)	0.331 (0.471)	0.382 (0.486)
Childhood Region:District	0.228 (0.422)	0.272 (0.445)	0.313 (0.464)
Childhood Region:Village	0.511 (0.503)	0.396 (0.489)	0.305 (0.460)
Child aged 0_5 in the household	0.380 (0.488)	0.529 (0.500)	0.705 (0.456)
Child aged 15 and above	0.587 (0.495)	0.367 (0.482)	0.163 (0.369)
Number of young children	1.293 (0.584)	1.513 (0.742)	1.596 (0.734)
Son preference	0.413 (0.495)	0.356 (0.479)	0.330 (0.470)
Finding Women's Working Inappropriate	0.130 (0.339)	0.088 (0.283)	0.082 (0.274)
Interfaith Marriage is not Allowed	0.620 (0.488)	0.507 (0.500)	0.512 (0.500)
Traditionality Index	0.639 (0.563)	0.491 (0.494)	0.451 (0.465)
Lives in childhood region	0.685 (0.467)	0.732 (0.443)	0.687 (0.464)
Lives in childhood region (Husb)	0.717 (0.453)	0.731 (0.444)	0.724 (0.447)
Only one grandfather alive	0.391 (0.491)	0.464 (0.499)	0.295 (0.456)
Both grandfathers alive	0.120 (0.326)	0.331 (0.471)	0.645 (0.479)
Observations	92	694	2,756

Source: Family Structure Survey Micro Data Set 2016. The standard deviations are presented in parentheses.

Table A6: Effects of grandmothers' proximity on mother's labor force participation and employment status

	<i>Dependent Variables</i>			
	MLFP		Employment	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	0.001 (0.016)	0.182** (0.081)	0.004 (0.015)	0.164** (0.079)
F statistic:		131.100		131.100
Same Town or closer				
Proximity	0.026* (0.013)	0.136** (0.061)	0.020 (0.013)	0.123** (0.059)
F statistic:		196.895		196.895
Same city or closer				
Proximity	0.030* (0.016)	0.132** (0.059)	0.030** (0.015)	0.119** (0.058)
F statistic:		216.153		216.153
Observations			3,542	

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS1 current region-age level are given in the parentheses. Mean of MLFP and Employment is 0.25 (0.433) and 0.237 (0.426). Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (province center (omitted), district center and sub-district or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least 1 child aged 0–5, whether there is an older sibling, the number of young children in the household. The Proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is 0. In columns 2 and 4, the number of alive grandmothers used as an instrument. The sample includes all married mothers aged 18–50 inclusive, with at least one child aged 0–10.

Table A7: Descriptive statistics for the complier and non-complier subpopulations

	District			Town			City		
	Whole	Compliers	Never Takers	Whole	Compliers	Never Takers	Whole	Compliers	Never Takers
Age	33.619 (0.105)	33.290 (0.181)	33.814 (0.131)	33.619 (0.105)	33.348 (0.125)	34.175 (0.188)	33.619 (0.108)	33.527 (0.120)	33.996 (0.243)
Primary school or less	0.471 (0.008)	0.567 (0.014)	0.414 (0.010)	0.471 (0.008)	0.503 (0.010)	0.405 (0.014)	0.471 (0.008)	0.493 (0.009)	0.381 (0.018)
Primary Education	0.179 (0.006)	0.192 (0.011)	0.172 (0.008)	0.179 (0.006)	0.184 (0.008)	0.169 (0.011)	0.179 (0.006)	0.182 (0.007)	0.168 (0.014)
Secondary Education	0.179 (0.006)	0.151 (0.010)	0.195 (0.009)	0.179 (0.006)	0.173 (0.008)	0.190 (0.011)	0.179 (0.006)	0.179 (0.007)	0.178 (0.015)
Tertiary Education	0.171 (0.006)	0.090 (0.008)	0.220 (0.009)	0.171 (0.006)	0.139 (0.007)	0.236 (0.013)	0.171 (0.006)	0.146 (0.007)	0.273 (0.017)
No School(Husb.)	0.351 (0.008)	0.443 (0.014)	0.297 (0.010)	0.351 (0.008)	0.382 (0.010)	0.290 (0.014)	0.351 (0.008)	0.370 (0.009)	0.277 (0.017)
Primary Edu.(Husb.)	0.163 (0.006)	0.204 (0.011)	0.138 (0.008)	0.163 (0.006)	0.184 (0.008)	0.120 (0.009)	0.163 (0.006)	0.176 (0.007)	0.108 (0.012)
Secondary Edu.(Husb.)	0.240 (0.007)	0.234 (0.012)	0.244 (0.009)	0.240 (0.007)	0.254 (0.009)	0.212 (0.012)	0.240 (0.007)	0.254 (0.008)	0.184 (0.015)
Tertiary Edu.(Husb.)	0.246 (0.007)	0.119 (0.010)	0.321 (0.010)	0.246 (0.007)	0.181 (0.008)	0.379 (0.015)	0.246 (0.007)	0.200 (0.008)	0.431 (0.018)
Employment(Husb.)	0.915 (0.005)	0.878 (0.009)	0.937 (0.005)	0.915 (0.005)	0.904 (0.006)	0.937 (0.007)	0.915 (0.005)	0.907 (0.006)	0.950 (0.008)
Village	0.328 (0.008)	0.426 (0.014)	0.270 (0.010)	0.328 (0.008)	0.336 (0.010)	0.313 (0.013)	0.328 (0.008)	0.335 (0.009)	0.299 (0.017)
Chronic Illness	0.185 (0.006)	0.199 (0.011)	0.177 (0.008)	0.185 (0.007)	0.191 (0.008)	0.174 (0.011)	0.185 (0.007)	0.191 (0.007)	0.164 (0.014)
At least 1 child aged 0-5	0.662 (0.008)	0.658 (0.013)	0.665 (0.010)	0.662 (0.008)	0.670 (0.009)	0.646 (0.014)	0.662 (0.008)	0.668 (0.009)	0.637 (0.019)
At least 1 child aged 15 and above	0.214 (0.007)	0.237 (0.012)	0.201 (0.009)	0.214 (0.007)	0.213 (0.009)	0.216 (0.012)	0.214 (0.007)	0.214 (0.008)	0.212 (0.016)
Number of young children	1.572 (0.012)	1.637 (0.022)	1.533 (0.015)	1.572 (0.013)	1.593 (0.016)	1.528 (0.020)	1.572 (0.013)	1.588 (0.014)	1.506 (0.026)
Having Son Preference	0.337 (0.008)	0.415 (0.015)	0.291 (0.009)	0.337 (0.008)	0.352 (0.010)	0.306 (0.014)	0.337 (0.008)	0.341 (0.009)	0.322 (0.018)
Finding Women's Working Inappropriate	0.084 (0.005)	0.091 (0.008)	0.080 (0.006)	0.084 (0.004)	0.088 (0.005)	0.077 (0.008)	0.084 (0.005)	0.086 (0.005)	0.077 (0.010)
Interfaith marriage is not Allowed	0.514 (0.008)	0.562 (0.014)	0.485 (0.011)	0.514 (0.008)	0.524 (0.010)	0.492 (0.014)	0.514 (0.009)	0.519 (0.010)	0.491 (0.019)
Traditionality Index	0.464 (0.008)	0.554 (0.014)	0.411 (0.009)	0.464 (0.008)	0.487 (0.010)	0.417 (0.013)	0.464 (0.008)	0.472 (0.008)	0.432 (0.018)
Lives in Hometown	0.695 (0.008)	0.813 (0.011)	0.625 (0.011)	0.695 (0.008)	0.811 (0.008)	0.457 (0.015)	0.695 (0.008)	0.803 (0.008)	0.257 (0.017)
Live in Husband's Hometown	0.725 (0.008)	0.846 (0.011)	0.653 (0.011)	0.725 (0.008)	0.837 (0.008)	0.495 (0.015)	0.725 (0.008)	0.827 (0.007)	0.308 (0.017)
Only one grandfather is alive	0.330 (0.008)	0.345 (0.013)	0.322 (0.010)	0.330 (0.008)	0.329 (0.010)	0.332 (0.014)	0.330 (0.008)	0.328 (0.009)	0.339 (0.019)
Both grandfathers are alive	0.570 (0.008)	0.527 (0.014)	0.595 (0.011)	0.570 (0.008)	0.566 (0.010)	0.578 (0.015)	0.570 (0.009)	0.568 (0.009)	0.577 (0.019)
Proportions	1	0.373	0.627	1	0.673	0.327	1	0.803	0.197

Notes: Bootstrapped standard errors are given in the parentheses.

Table A8: First-stage regression for various subgroups

	District		Town		City	
	Age<35	Age>35	Age<35	Age>35	Age<35	Age>35
Instrument	0.184*** (0.024)	0.170*** (0.020)	0.214*** (0.026)	0.249*** (0.020)	0.176*** (0.025)	0.277*** (0.019)
Observation	2187	1355	2187	1355	2187	1355
	Primary educ. or less	Secondary educ. or above	Primary educ. or less	Secondary educ. or above	Primary educ. or less	Secondary educ. or above
Instrument	0.199*** (0.018)	0.078*** (0.028)	0.250*** (0.018)	0.159*** (0.036)	0.253*** (0.016)	0.170*** (0.035)
Observation	2303	1239	2303	1239	2303	1239
	Primary educ. or less(Husb)	Secondary educ. or above(Husb)	Primary educ. or less(Husb)	Secondary educ. or above(Husb)	Primary educ. or less(Husb)	Secondary educ. or above(Husb)
Instrument	0.193*** (0.020)	0.133*** (0.024)	0.243*** (0.020)	0.197*** (0.029)	0.255*** (0.018)	0.192*** (0.027)
Observation	1821	1721	1821	1721	1821	1721
	Born in Village	Born in Center	Born in Village	Born in Center	Born in Village	Born in Center
Instrument	0.192*** (0.027)	0.150*** (0.019)	0.254*** (0.026)	0.216*** (0.021)	0.256*** (0.024)	0.211*** (0.020)
Observation	1162	2380	1162	2380	1162	2380
	Child Aged Below 6	No Child Aged Below 6	Child Aged Below 6	No Child Aged Below 6	No Child Aged Below 6	Child Aged Below 6
Instrument	0.179*** (0.022)	0.152*** (0.023)	0.228*** (0.023)	0.223*** (0.024)	0.200*** (0.022)	0.268*** (0.022)
Observation	2345	1197	2345	1197	2345	1197
	Older Sibling	No Older Sibling	Older Sibling	No Older Sibling	Older Sibling	No Older Sibling
Instrument	0.171*** (0.026)	0.164*** (0.019)	0.246*** (0.025)	0.207*** (0.022)	0.286*** (0.024)	0.201*** (0.021)
Observation	758	2784	758	2784	758	2784
	Few Child.	Many Child.	Few Child.	Many Child.	Few Child.	Many Child.
Instrument	0.168*** (0.016)	0.188*** (0.070)	0.232*** (0.017)	0.169*** (0.057)	0.238*** (0.016)	0.164*** (0.052)
Observation	3165	377	3165	377	3165	377
	Son Pref.	No Son Pref.	Son Pref.	No Son Pref.	Son Pref.	No Son Pref.
Instrument	0.221*** (0.027)	0.142*** (0.018)	0.269*** (0.027)	0.206*** (0.020)	0.275*** (0.025)	0.209*** (0.020)
Observation	1194	2348	1194	2348	1194	2348
	Women Can Work	Women Can not Work	Women Can Work	Women Can not Work	Women Can Work	Women Can not Work
Instrument	0.206*** (0.057)	0.163*** (0.016)	0.295*** (0.054)	0.218*** (0.017)	0.272*** (0.052)	0.226*** (0.017)
Observation	298	3244	298	3244	298	3244
	Interfaith Marriage Not Allowed	Interfaith Marriage Allowed	Interfaith Marriage Not Allowed	Interfaith Marriage Allowed	Interfaith Marriage Not Allowed	Interfaith Marriage Allowed
Instrument	0.177*** (0.021)	0.156*** (0.022)	0.254*** (0.023)	0.194*** (0.024)	0.250*** (0.022)	0.215*** (0.024)
Observation	1819	1723	1819	1723	1819	1723

	Conservative	Nonconservative	Conservative	Nonconservative	Conservative	Nonconservative
Instrument	0.211*** (0.025)	0.137*** (0.019)	0.266*** (0.025)	0.198*** (0.021)	0.275*** (0.023)	0.201*** (0.021)
Observation	1355	2187	1355	2187	1355	2187
	Live in Home town	Do not Live in Home town	Live in Home town	Do not Live in Home town	Live in Home town	Do not Live in Home town
Instrument	0.184*** (0.019)	0.130*** (0.023)	0.231*** (0.019)	0.211*** (0.028)	0.214*** (0.018)	0.273*** (0.028)
Observation	2463	1079	2463	1079	2463	1079
	Live in Husb. Home town	Do not Live in Husb. Home town	Live in Husb. Home town	Do not Live in Husb. Home town	Live in Husb. Home town	Do not Live in Husb. Home town
Instrument	0.192*** (0.019)	0.093*** (0.024)	0.243*** (0.019)	0.167*** (0.032)	0.227*** (0.017)	0.230*** (0.031)
Observation	2569	973	2569	973	2569	973

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10. Few children corresponds to 2 children or less

Table A9: First stage estimation results

<i>Dependent variable: Grandparent's proximity</i>			
	District	Town	City
Number of grandmothers alive	0.168*** (0.015)	0.225*** (0.016)	0.232*** (0.016)
Primary education	-0.018 (0.026)	-0.024 (0.025)	-0.014 (0.021)
Secondary education	-0.015 (0.026)	-0.020 (0.024)	-0.006 (0.020)
Tertiary education	-0.033 (0.029)	-0.006 (0.030)	-0.037 (0.028)
Primary education (Husband)	-0.002 (0.025)	0.012 (0.021)	0.016 (0.018)
Secondary education (Husband)	-0.078*** (0.023)	-0.047** (0.021)	-0.012 (0.016)
Tertiary education (Husband)	-0.223*** (0.028)	-0.264*** (0.026)	-0.198*** (0.025)
Employment (Husband)	-0.104*** (0.028)	-0.033 (0.025)	-0.035* (0.021)
District Center	-0.007 (0.020)	-0.042** (0.019)	-0.014 (0.016)
Village	0.095*** (0.021)	-0.042** (0.020)	-0.003 (0.017)
Chronic illness	-0.001 (0.020)	0.012 (0.020)	0.015 (0.016)
At least 1 child aged 0–5	-0.018 (0.020)	0.012 (0.019)	0.025 (0.016)
At least 1 child aged 15 and above	0.039 (0.024)	-0.002 (0.023)	-0.013 (0.020)
Number of young children	0.028** (0.013)	0.003 (0.011)	0.005 (0.010)
Observations	3,542	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses.

Table A10: Effects of grandmothers' proximity on mothers' labor force participation

	<i>Dependent Variable: MLFP</i>					
	District		Town		City	
	OLS	IV	OLS	IV	OLS	IV
Proximity	0.001 (0.013)	0.182** (0.080)	0.026** (0.013)	0.136** (0.060)	0.030* (0.015)	0.132** (0.059)
Primary education	0.037* (0.019)	0.040** (0.020)	0.038* (0.019)	0.040** (0.019)	0.037* (0.019)	0.038** (0.019)
Secondary Education	0.114*** (0.022)	0.115*** (0.022)	0.114*** (0.022)	0.115*** (0.022)	0.114*** (0.022)	0.113*** (0.022)
Tertiary education	0.523*** (0.028)	0.527*** (0.028)	0.523*** (0.028)	0.522*** (0.028)	0.524*** (0.028)	0.526*** (0.027)
Primary education (Husband)	0.015 (0.020)	0.015 (0.020)	0.015 (0.020)	0.013 (0.020)	0.014 (0.020)	0.013 (0.020)
Secondary Education (Husband)	-0.003 (0.018)	0.010 (0.019)	-0.002 (0.018)	0.003 (0.018)	-0.003 (0.018)	-0.002 (0.018)
Tertiary education (Husband)	-0.016 (0.022)	0.022 (0.028)	-0.010 (0.022)	0.017 (0.026)	-0.011 (0.022)	0.007 (0.024)
Employment (Husband)	-0.060** (0.025)	-0.043 (0.027)	-0.060** (0.025)	-0.057** (0.025)	-0.060** (0.025)	-0.057** (0.025)
District Center	-0.004 (0.016)	-0.002 (0.016)	-0.003 (0.016)	0.002 (0.016)	-0.003 (0.016)	-0.002 (0.016)
Village	-0.008 (0.016)	-0.024 (0.017)	-0.006 (0.016)	-0.001 (0.016)	-0.007 (0.016)	-0.006 (0.015)
Chronic illness	0.012 (0.017)	0.014 (0.017)	0.012 (0.017)	0.012 (0.017)	0.012 (0.017)	0.012 (0.017)
At least 1 child aged 0–5	-0.083*** (0.017)	-0.080*** (0.017)	-0.083*** (0.017)	-0.085*** (0.017)	-0.084*** (0.017)	-0.086*** (0.017)
At least 1 child aged 15 and above	-0.040** (0.020)	-0.046** (0.021)	-0.040** (0.020)	-0.039** (0.020)	-0.040* (0.020)	-0.037* (0.020)
Number of young children	-0.023** (0.010)	-0.029*** (0.010)	-0.023** (0.010)	-0.024** (0.010)	-0.023** (0.010)	-0.024** (0.009)
Observations	3,542					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Control variables are the same with the baseline estimation. Age fixed effects, dummy variables for the current region of residence and the childhood region included, but coefficients are not reported.

Table A11: Effects of grandmothers' proximity on mothers' employment status

	<i>Dependent Variable: Employment</i>					
	District		Town		City	
	OLS	IV	OLS	IV	OLS	IV
Proximity	0.004 (0.013)	0.164** (0.079)	0.020 (0.013)	0.123** (0.060)	0.030* (0.016)	0.119** (0.058)
Primary Education	0.037* (0.019)	0.039** (0.020)	0.037* (0.019)	0.039** (0.019)	0.037* (0.019)	0.038** (0.019)
Secondary education	0.110*** (0.022)	0.111*** (0.023)	0.110*** (0.022)	0.111*** (0.022)	0.110*** (0.022)	0.109*** (0.022)
Tertiary Education	0.516*** (0.027)	0.519*** (0.027)	0.515*** (0.027)	0.514*** (0.027)	0.516*** (0.027)	0.518*** (0.027)
Primary Education (Husband)	0.008 (0.019)	0.008 (0.019)	0.008 (0.019)	0.006 (0.019)	0.008 (0.019)	0.006 (0.019)
Secondary education (Husband)	-0.002 (0.018)	0.009 (0.019)	-0.002 (0.018)	0.002 (0.018)	-0.002 (0.018)	-0.002 (0.018)
Tertiary education (Husband)	-0.021 (0.021)	0.013 (0.027)	-0.017 (0.022)	0.009 (0.026)	-0.016 (0.021)	0.000 (0.023)
Employment (Husband)	-0.021 (0.024)	-0.005 (0.026)	-0.021 (0.024)	-0.018 (0.024)	-0.020 (0.024)	-0.018 (0.024)
District Center	-0.008 (0.015)	-0.007 (0.016)	-0.007 (0.015)	-0.003 (0.016)	-0.007 (0.015)	-0.006 (0.015)
Village	-0.012 (0.015)	-0.026 (0.017)	-0.011 (0.015)	-0.006 (0.015)	-0.011 (0.015)	-0.010 (0.015)
Chronic illness	0.009 (0.017)	0.010 (0.017)	0.009 (0.017)	0.009 (0.017)	0.009 (0.017)	0.008 (0.017)
At least1 child aged 0–5	-0.081*** (0.017)	-0.078*** (0.017)	-0.081*** (0.017)	-0.082*** (0.017)	-0.081*** (0.017)	-0.084*** (0.017)
At least 1 child aged 15 and above	-0.036* (0.020)	-0.042** (0.021)	-0.036* (0.020)	-0.035* (0.020)	-0.036* (0.020)	-0.034* (0.020)
Number of young children	-0.020** (0.010)	-0.025** (0.010)	-0.020** (0.010)	-0.021** (0.009)	-0.020** (0.010)	-0.021** (0.009)
Observations	3,542					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Control variables are the same with the baseline estimation. Age fixed effects, dummy variables for the current region of residence and the childhood region included, but coefficients are not reported.

Table A12: Effect of mothers' or mothers-in-law's proximity on their daughter's labor market outcomes

	<i>Dependent Variables</i>			
	Mother's Proximity		Mother-in-law's Proximity	
	MLFP	Employment	MLFP	Employment
Same neighborhood/district/village or closer				
Proximity	0.188*	0.173	0.083*	0.074
	(0.113)	(0.112)	(0.049)	(0.048)
F statistic:	304.828	304.828	834.768	834.768
Same town or closer				
Proximity	0.070*	0.064	0.048*	0.043
	(0.041)	(0.041)	(0.028)	(0.028)
F statistic:	1012.518	1012.518	2467.799	2467.799
Same city or closer				
Proximity	0.050*	0.046	0.039*	0.034
	(0.030)	(0.029)	(0.023)	(0.023)
F statistic:	2003.992	2003.992	4857.792	4857.792
Observations	3,542			

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Mean of MLFP and Employment is 0.25 (0.433) and 0.237 (0.426), respectively. Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (province center (omitted), district center and sub-district or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least 1 child aged 0–5, whether there is an older sibling, number of young children in the household. In columns one and two the proximity variable is equal to one if the mother lives close and it is equal to one if the mother-in-law lives close in the third and fourth columns; otherwise, it is 0. We define two different instruments by using the information on whether maternal and paternal grandmothers are alive. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10.

Table A13: Effects of grandmothers' proximity on labor market outcomes for different samples

	<i>Dependent Variables</i>	
	MLFP	Employment
Sample 1: Same District & Another City	0.156* (0.081)	0.165** (0.081)
F statistic:	97.75	
Mean dependent variable	0.235 (0.424)	0.223 (0.417)
Observations	1,514	
Sample 2: Same Town & Another City	0.071 (0.079)	0.046 (0.078)
F statistic:	102.5	
Mean dependent variable	0.273 (0.446)	0.258 (0.438)
Observations	1,609	
Sample 3: Same City & Another City	0.073 (0.102)	0.056 (0.099)
F statistic:	72.20	
Mean dependent variable	0.265 (0.441)	0.255 (0.436)
Observations	1,221	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses.

Table A14: Effects of number of alive grandparents on mothers' and fathers' labor market outcomes

	<i>Dependent Variables</i>					
	MLFP	Employment	MLFP	Employment	MLFP	Employment
<i>Groups:</i>						
Women without young children:						
Number of grandmothers alive	0.016 (0.013)	0.014 (0.013)				
Fathers with young children:						
Number of grandmothers alive			-0.000 (0.005)	0.005 (0.010)		
Mothers with young children:						
Number of grandfathers alive					0.009 (0.010)	0.009 (0.010)
Observations	2,509		3,408		3,542	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS2 childhood region-age level. Control variables are the same as the baseline estimation. For the first four columns, the independent variable: Number of grandmothers alive. For the fifth and sixth columns, the independent variable: Number of grandfathers alive. The results of the sample of married women with children aged 11 and older or no children are presented in columns one and two. The results of the sample of fathers with children aged 10 and younger are presented in the third and fourth columns. The last two columns consider married women with young children.

Table A15: Effects of grandmothers' proximity on stating childcare and household chores as a reason for not working

<i>Dependent Variable: Not Working as she is busy with childcare and household chores</i>				
	Mothers with young children		Women without young children	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	-0.045*** (0.015)	-0.204** (0.086)	-0.089*** (0.021)	-0.071 (0.069)
F statistic:		121.126		321.186
Same town or closer				
Proximity	-0.072*** (0.014)	-0.153** (0.064)	-0.051*** (0.019)	-0.050 (0.049)
F statistic:		186.531		620.949
Same city or closer				
Proximity	-0.068*** (0.017)	-0.148** (0.063)	-0.071*** (0.022)	-0.047 (0.046)
F statistic:		213.617		812.586
Observations		3,542		2,509

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. The mean of "Not Working" is 0.684 (0.465) and 0.564 (0.496) for the group of mothers with young children and women without young children, respectively. Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (province center (omitted), district center and sub-district or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness. The Proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is 0. In columns 2 and 4, the number of alive grandmothers is used as an instrument. The sample includes all married mothers aged 18–50 inclusive, with at least one child aged 0–10.

Table A16: Differential effects of mothers and mother in law’s proximity on measures of tradition-ality

	District	Town	City
Dependent Variables:			
Having Son Preference			
Mother	-0.007 (0.151)	-0.003 (0.056)	-0.002 (0.040)
Mother-in-law	0.062 (0.064)	0.036 (0.037)	0.029 (0.030)
Women cannot Work			
Mother	0.096 (0.084)	0.035 (0.031)	0.025 (0.022)
Mother-in-law	-0.009 (0.040)	-0.005 (0.023)	-0.004 (0.019)
Interfaith Marriage is not Allowed			
Mother	0.354** (0.163)	0.131** (0.061)	0.094** (0.044)
Mother-in-law	0.032 (0.069)	0.018 (0.040)	0.015 (0.032)
Traditionality Index			
Mother	0.033 (0.157)	0.012 (0.058)	0.009 (0.042)
Mother-in-law	0.034 (0.064)	0.019 (0.037)	0.016 (0.030)
Observations		3,542	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation. Endogenous variables are mothers’ proximity or mother-in-law’s proximity. Instruments are presence of mother or mother-in-law. The first-stage F statistics are above 10.

Table A17: Effects of grandmothers' proximity on labor market status for the subgroup of women who do not residing with their parents

	<i>Dependent Variables</i>	
	MLFP	Employment
Analysis 1: Same District	0.220** (0.103)	0.182* (0.103)
F statistic:	81.651	
Analysis 2: Same Town	0.141** (0.066)	0.117* (0.066)
F statistic:	152.508	
Analysis 3: Same City	0.129** (0.060)	0.107* (0.060)
F statistic:	196.077	
Observations	3,154	

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Mean of MLFP and Employment is 0.263 (0.440) and 0.250 (0.433).

Table A18: Differential effects of grandmothers' proximity on mother's labor force participation and employment status

	<i>Dependent Variables</i>					
	MLFP			Employment		
	District	Town	City	District	Town	City
Analysis 1: Education Level: Less than Secondary						
Mother's Proximity x Less Than Secondary		0.301 (0.256)	0.298 (0.241)		0.275 (0.262)	0.273 (0.248)
Mother's Proximity		-0.130 (0.260)	-0.131 (0.243)		-0.120 (0.267)	-0.120 (0.250)
First stage F stat:						
Mother's Proximity x Less Than Secondary	3.50	30.97	41.96	3.50	30.97	41.96
Mother's Proximity	4.12	17.97	19.44	4.12	17.97	19.44
Analysis 2: Childhood Region Type: Village						
Mother's Proximity x Village	-0.116 (0.144)	-0.076 (0.104)	-0.093 (0.107)	-0.048 (0.143)	-0.026 (0.103)	-0.041 (0.105)
Mother's Proximity	0.236** (0.108)	0.170* (0.078)	0.175** (0.081)	0.187* (0.109)	0.134* (0.078)	0.138* (0.081)
First stage F stat:						
Mother's Proximity x Village	136.35	220.47	225.44	136.35	220.47	225.44
Mother's Proximity	78.04	117.81	111.55	78.04	117.81	111.55
Analysis 3: Ownership status of the house: Owner						
Mother's Proximity x Owner	-0.122 (0.187)	-0.079 (0.124)	-0.072 (0.122)	-0.136 (0.182)	-0.088 (0.121)	-0.082 (0.118)
Mother's Proximity	0.253* (0.139)	0.182* (0.096)	0.173* (0.093)	0.243* (0.135)	0.175* (0.094)	0.166* (0.090)
First stage F stat:						
Mother's Proximity x Owner	102.90	181.96	190.02	102.90	181.96	190.02
Mother's Proximity	47.78	72.70	87.01	47.78	72.70	87.01
Analysis 4: Age of children: Child aged 0-5						
Mother in Law's Proximity x Child aged 0-5	-0.128 (0.187)	-0.076 (0.121)	-0.036 (0.112)	-0.066 (0.183)	-0.036 (0.119)	-0.001 (0.110)
Mother in Law's Proximity	0.259* (0.157)	0.179* (0.103)	0.150* (0.085)	0.204 (0.153)	0.143 (0.101)	0.120 (0.083)
First stage F stat:						
Mother in Law's Proximity x Child aged 0-5	93.91	175.09	189.33	93.91	175.09	189.33
Mother in Law's Proximity	56.87	97.70	151.26	56.87	97.70	151.26
Analysis 5: Degree of traditionality: Traditional						
Mother in Law's Proximity x Traditional	-0.142 (0.160)	-0.082 (0.110)	-0.095 (0.112)	-0.085 (0.156)	-0.044 (0.107)	-0.055 (0.109)
Mother in Law's Proximity	0.261* (0.135)	0.177** (0.090)	0.180** (0.092)	0.212 (0.133)	0.145 (0.088)	0.148 (0.090)
First stage F stat:						
Mother in Law's Proximity x Traditional	119.92	207.49	215.44	119.92	207.49	215.44
Mother in Law's Proximity	57.24	100.07	97.36	57.24	100.07	97.36
Observations	3,542					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS2 childhood region-age level. Dependent variables are MLFP and employment status. In the first analysis, endogenous variables are the mothers' proximity and its interaction with the presence of at least one sister. Control variables are the same as the baseline estimation, except that for this analysis we include the presence of the sister as an additional control variable. In the second analyses, endogenous variables are the mothers-in-law's proximity and its interaction with the presence of at least one sister-in-law. First-stage F statistics are Sanderson-Windmeijer (2016) F statistics for multiple endogenous regressors. The corresponding Stock and Yogo (2005) critical value for 10% maximal IV size is 7.03.

Table A19: Effects of grandmothers' proximity on mother's labor market outcomes after dropping potentially endogenous variables

	<i>Dependent Variables</i>			
	MLFP		Employment	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	-0.001 (0.013)	0.168** (0.080)	0.003 (0.013)	0.151* (0.080)
F statistic:		122.205		122.205
Same town or closer				
Proximity	0.024* (0.013)	0.125** (0.060)	0.019 (0.013)	0.113* (0.060)
F statistic:		189.158		189.158
Same city or closer				
Proximity	0.026* (0.015)	0.122** (0.059)	0.027* (0.016)	0.110* (0.058)
F statistic:		216.981		216.981
Observations			3,542	

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Mean of MLFP and Employment is 0.25 (0.433) and 0.237 (0.426). Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (province center (omitted), district center and sub-district or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness. The Proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is 0. In columns 2, 4, and 6, the number of alive grandmothers used as an instrument. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10.

Table A20: Effects of grandmothers' proximity on mother's labor force participation and employment status for different sample specifications

	<i>Dependent Variables</i>					
	MLFP			Employment		
	District	Town	City	District	Town	City
Cut-off age level:9	0.137* (0.078)	0.102* (0.058)	0.103* (0.059)	0.124 (0.077)	0.093 (0.058)	0.094 (0.058)
F statistic	108.364	170.457	181.884	108.364	170.457	181.884
Mean dependent variable		0.246 (0.431)			0.233 (0.423)	
Observations	3,351					
Cut-off age level:11	0.219*** (0.076)	0.165*** (0.057)	0.161*** (0.056)	0.199*** (0.075)	0.150*** (0.057)	0.146*** (0.056)
F statistic	140.099	219.483	247.083	140.099	219.483	247.083
Mean dependent variable		0.253 (0.435)			0.240 (0.427)	
Observations	3,713					
Mothers without chronic illnesses	0.185** (0.084)	0.143** (0.066)	0.142** (0.066)	0.181** (0.084)	0.141** (0.066)	0.139** (0.065)
F statistic	111.732	160.872	176.641	111.732	160.872	176.641
Mean dependent variable		0.255 (0.436)			0.243 (0.429)	
Observations	3,175					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS2 childhood region-age level. Dependent variables are MLFP and employment status. Control variables are the same as the baseline estimation.

Table A21: Effects of grandmothers' proximity on mother's labor force participation and employment status using different instrumented and instrumental variables

	<i>Dependent Variables</i>					
	MLFP			Employment		
	District	Town	City	District	Town	City
Analysis 1: <i>Instrumented variable is equal to 1 if mother or in-law is geographically close and takes 2 if mother and in-law is geographically close.</i>						
Proximity	0.118** (0.053)	0.057** (0.025)	0.042** (0.019)	0.107** (0.052)	0.051** (0.025)	0.038** (0.019)
F statistic	197.048	646.083	1336.543	197.048	646.083	1336.543
Chi-sq(1) P-val	-	-	-	-	-	-
Analysis 2: <i>Two different instruments for the mother and mother-in-law, identical instrumented variable in the baseline analysis.</i>						
Proximity	0.130* (0.069)	0.118** (0.057)	0.124** (0.058)	0.116* (0.068)	0.106* (0.056)	0.112** (0.057)
F statistic	85.231	98.336	104.605	85.231	98.336	104.605
Chi-sq(1) P-val	0.215	0.402	0.608	0.240	0.416	0.605
Analysis 3: <i>Two different instruments for the mother and mother-in-law, identical instrumented variable in analysis 1.</i>						
Proximity	0.100** (0.049)	0.054** (0.025)	0.042** (0.019)	0.090* (0.048)	0.049** (0.025)	0.038** (0.019)
F statistic	125.314	335.933	676.689	125.314	335.933	676.689
Chi-sq(1) P-val	0.341	0.624	0.751	0.360	0.620	0.736
Observations	3,542					

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation.

Table A22: Effects of grandmothers' proximity on having a young kid in the household

	<i>Dependent Variables</i>	
	Probability of having a young child	Number of young children
Same neighborhood/district/village or closer	0.051 (0.048)	0.226 (0.143)
F statistics	448.023	122.847
Same town or closer	0.037 (0.035)	0.170 (0.108)
F statistics	741.211	187.426
Same city or closer	0.035 (0.033)	0.166 (0.105)
F statistics	844.364	214.642
Observations	6,051	3,542

Notes: * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Standard errors clustered by the NUTS2 childhood region-age level are given in the parentheses. The mean of having a young kid is 0.585 (0.493). The mean of number of total children is 1.572 (0.734). In the first column, regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary and tertiary education), whether spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (province center (omitted), district center and sub-district or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness. The dependent variable is a dummy variable equal to one if the woman has a young child, 0 otherwise. In the second column, the model includes additional control variables: whether there is at least 1 child aged 0-5 and whether there is an older sibling. The dependent variable is equal to total number of young children. The Proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is 0. The number of alive grandmothers used as an instrument. In the first model, the sample includes all married women aged 18–50 inclusive with children or no children. In the second model, it includes all married mothers, aged 18-50, with at least one child aged 0-10.

11 Online Appendix B

11.1 Potential Violation of Exclusion Restriction

We employ two strategies to assess the sensitivity of the IV estimates to violations of the exclusion restriction: The Imperfect Instrumental Variable (IIV) method proposed by Nevo and Rosen (2012), and the Plausible Exogeneity test by Conley et al. (2012).

11.1.1 (Nevo and Rosen, 2012)

The implementation of Nevo and Rosen (2012)'s method requires that the correlation between the instrumental variable and the error term be in the same direction as the correlation between the original endogenous regressor and the error term (Assumption 3 in Nevo and Rosen, 2012). Therefore, we multiply the proximity variable by -1 so that this assumption is satisfied. Traditional women tend to live close but stay out of the labor market; therefore, $\rho_{xu} > 0$. Women whose mothers die earlier might come from poorer socioeconomic backgrounds. Women from lower socioeconomic backgrounds work less if they have fewer skills and education. That is, they are less likely to work and have a mother or in-law who is still alive, so $\rho_{zu} > 0$.

It is implausible to expect that the death of grandmother is even more endogenous than our endogenous variable (proximity). As a result, we expect the instruments to be less correlated with the error term than the original endogenous variable (Assumption 4 in Nevo and Rosen, 2012). Using the constructed IV by Nevo and Rosen, 2012's approach for each definition of proximity variable, the estimates of the effects of proximity on labor force participation are as follows:

- The coefficient of proximity_district is statistically insignificant and between 0.026 and 0.182 (with a confidence interval of -0.007 and 0.339).
- The coefficient of proximity_town is statistically significant and between 0.046 and 0.136 (with a confidence interval of 0.014 and 0.254).
- The coefficient of proximity_city is statistically significant and between 0.051 and 0.132 (with a confidence interval of 0.013 and 0.247).

Using the constructed IV by Nevo and Rosen, 2012's approach for each definition of proximity variable, the estimates of the effects of proximity on employment are as follows:

- The coefficient of proximity_district is statistically insignificant and between 0.026 and 0.164 (with a confidence interval of -0.006 and 0.320).

- The coefficient of `proximity_town` is statistically significant and between 0.039 and 0.123 (with a confidence interval of 0.007 and 0.239).
- The coefficient of `proximity_city` is statistically significant and between 0.049 and 0.119 (with a confidence interval of 0.011 and 0.233).

For each definition of proximity variable, the IV estimates are located in the confidence intervals for labor force participation and employment as outcome variables. Therefore, the IIV method shows that our IV estimation results are robust.

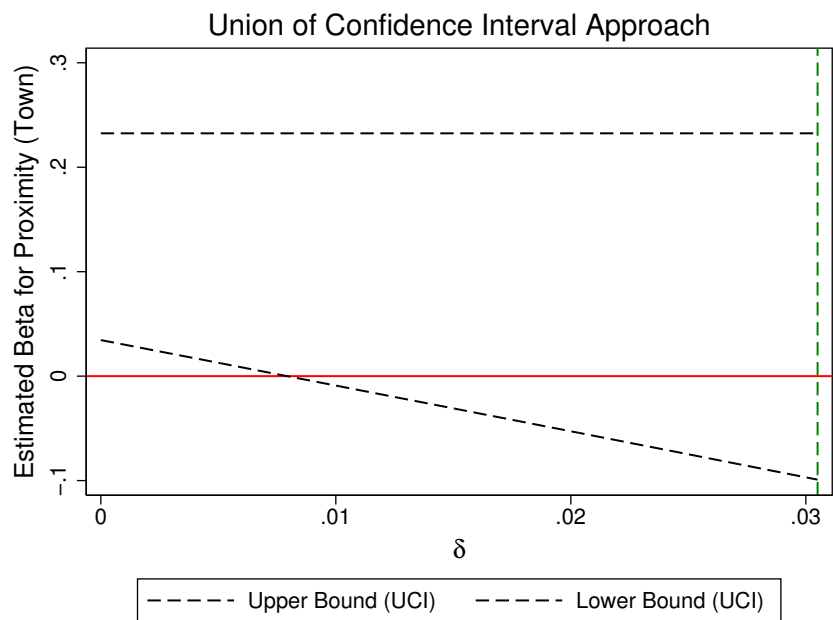
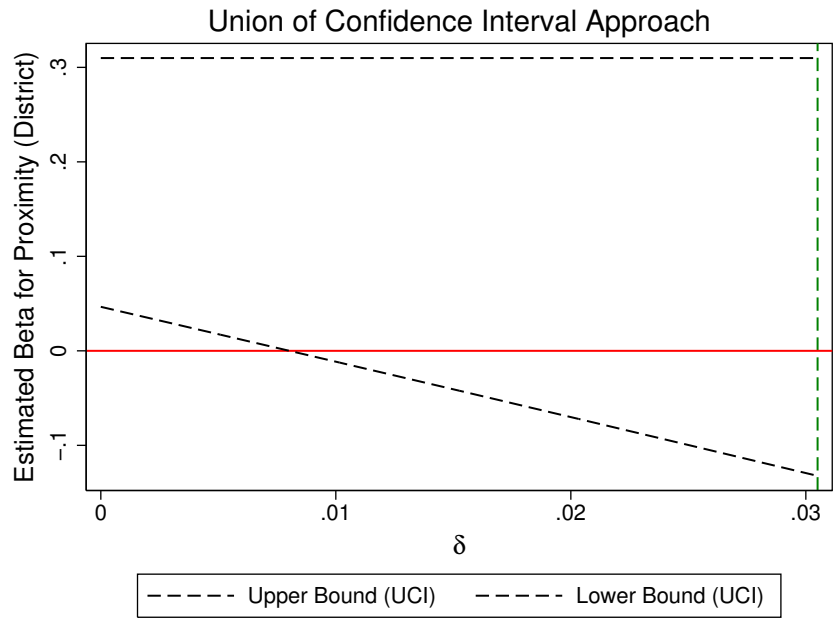
11.1.2 (Conley et al., 2012)

We examine the possibility that the instrument may have a direct effect on the probability of women being in the labor force or being employed. We apply the plausibly exogenous technique by Conley et al., 2012 to show that how large a potential direct effect of the instrument can be in order to turn the 2SLS estimate of labor force participation and employment outcomes insignificant. First, we estimate the direct effect of number of grandmothers alive on the labor market status, and impose that the support of the direct effect γ is in the interval $[0, \delta]$, with $\delta > 0$. Then, we report the 90% confidence intervals for the second-stage estimates of proximity variables for labor market status using the union of confidence intervals approach (UCI). The following figures⁴⁶ show the threshold at which the estimated 2SLS coefficient of the endogenous variable becomes statistically insignificant at the 10-percent level.

We present the results in Figures A1 and A2 for labor force participation and employment, respectively. When the endogenous variable is defined as living in the same district or closer to grandmothers, the direct effect on labor force participation would turn the second-stage effect insignificant at $\delta \approx 0.08$ (δ corresponding to the intersection of the zero line (red) with the dashed lower-bound of the confidence interval). That is, our 2SLS estimates on labor market outcome are significant as long as some omitted factors that are also captured by the number of alive grandmothers explain less than a quarter of the overall reduced form effect (25% (0.008/0.031)). In all figures, we show the overall reduced form effects with a vertical green line. For the second and third definitions of proximity variables, the omitted variable that is also captured by the number of grandmothers alive needs to be less than about 23% (0.007/0.031) of the overall reduced form effect in the second figure and 23% (0.007/0.031) in the third figure to depict our 2SLS estimates as significant. Similarly, Figure A2 shows how large the omitted variable should be to render 2SLS estimates insignificant for the employment outcome, and the results are similar. Therefore, these results show that our main results are robust to the violation of the exclusion restriction to some extent.

⁴⁶We use the "plausexog" Stata code produced by Damian Clark to produce the figures.

Figure A1: Plausibly exogenous technique (MLFP)



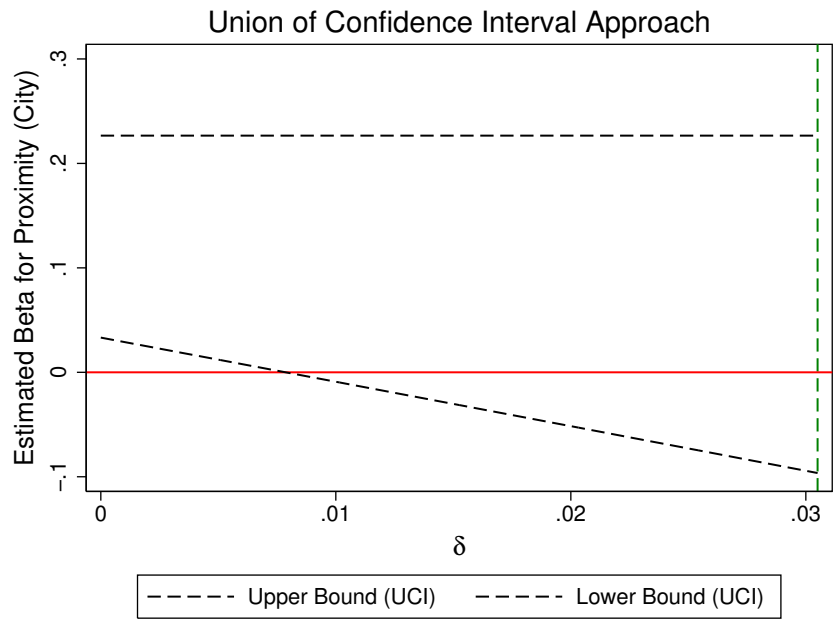


Figure A2: Plausibly exogenous technique (Employment)

