Family proximity, childcare, and women's labor force attachment

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ABSTRACT

We show that close geographical proximity to mothers or mothers-in-law has a substantial positive effect on the labor supply of married women with young children. We argue that the mechanism through which proximity increases labor supply is the availability of childcare. We interpret availability broadly enough to include not only regular scheduled childcare during work hours but also an insurance aspect of proximity (e.g., a mother or mother-in-law who can to provide irregular or unanticipated childcare). Using two large datasets, the National Survey of Families and Households and the public use files of the U.S. Census, we find that the predicted probability of employment and labor force participation is 4–10 percentage points higher for married women with young children living in close proximity to their mothers or their mothers-in-law compared with those living further away.

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1. Introduction

In this paper we show that close geographical proximity to mothers or mothers-in-law has a substantial positive effect on the labor supply of married women with young children.[1] Using two large datasets, the National Survey of Families and Households (NSFH) and the public use files of the U.S. Census, we find that the predicted probability of employment and labor force participation is 4–10 percentage points higher for married women with young children living close to their mothers or their mothers-in-law compared with those living further away. We argue that the availability of childcare is the mechanism linking proximity and labor supply. We interpret availability broadly enough to include not only regular scheduled childcare during work hours but also an insurance aspect of proximity (e.g., a mother or mother-in-law who can provide irregular or unanticipated childcare).

Two endogeneity issues complicate estimation. The first complication arises because childcare decisions and labor supply decisions are often made simultaneously. We deal with this endogeneity issue by using proximity as an instrument for childcare transfers from mother or mother-in-law. This IV approach assumes that proximity is exogenous, an assumption often made in the literature.

The second complication arises because of the potential endogeneity of proximity. Economists have generally ignored the endogeneity of proximity and several recent papers use proximity to mothers as an instrument for family-provided childcare to estimate the causal effect of childcare on labor supply (e.g., Dimova and Wolff, 2008; Dimova and Wolff, 2011; Zamarro, 2009). If proximity is not exogenous but is related to variables that affect labor supply and childcare decisions (e.g., both proximity and labor supply may be influenced by human capital investment, fertility and the marriage market), then the IV results are misleading. To deal with the potential endogeneity of proximity, we use census data to analyze the relationship between labor force attachment and proximity using a sample of "military wives," civilian women with husbands serving in the US military. Estimates based on census data support our conclusion that proximity has a substantial positive effect on the labor force attachment of married women with young children and that the mechanism is the availability of childcare.

Using proximity as an instrument for childcare transfers from mothers or mothers-in-law, we find that married women who receive childcare transfers from their mothers or mothers-in-law are 5.1 to 6.2 percentage points more likely to work in the paid labor force than those who do not receive childcare transfers. These estimates are based on predicted transfer of childcare in the previous month and may underestimate the full effect of geographic proximity. Proximity to a mother or mother-in-law who can respond to irregular or unanticipated childcare needs constitutes a kind of insurance the importance of which may be greater than the number of actual or predicted childcare hours would suggest. Market-based childcare may be a good substitute for care provided by a grandmother when the need for childcare is regular and antici-

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[1] We use "mothers" to refer to the older generation, "women" to refer to the middle generation (i.e., the adult daughters of the mothers) and "children" to refer to the youngest generation (i.e., grandchildren of the mothers). By "young children" we mean children 12 and under.

pated. But market-based childcare is less able to meet irregular or unanticipated childcare needs. Hence, the proximity of a grandmother who can pick up a sick child from school, take a child to after school sports practice, or care for a child whose parents are traveling on business may affect women's labor market choices, even if such childcare needs seldom arise.

To allay concerns that proximity affects labor force attachment through channels other than childcare, we show that proximity has no discernable effect on the labor force behavior of married women without childcare needs: those without young children. Although unmarried women with children are more likely than married women with children to benefit from work-related childcare by their mothers, we do not find a relationship between proximity and labor force attachment for unmarried women. This lack of effect is consistent with a more inelastic labor supply of unmarried women with children, making them less responsive to the availability of childcare.[2]

Using micro-data from the census, we find additional evidence that proximity to mothers or mothers-in-law increases the labor force attachment of married women with young children and that the likely mechanism is childcare. Because the census, unlike the NSFH, does not ask about proximity to mothers or mothers-in-law, we use living in one's birth state as a proxy for geographical proximity. Because the census does not ask about childcare, we estimate the relationship between labor force attachment and birth state residence. We report three separate analyses. First, we proceed as we did with the NSFH reduced form equations, assuming proximity is exogenous and investigating the effect on the labor force attachment of married women with young children of living in her birth state or her husband's birth state. Second, we consider a sample of military wives. The military wives provide an endogeneity control because their husbands' locations are determined by the military. For the military wives, we find that living in the birth state of both spouses increases the labor force attachment of married women with young children. Third, we consider a subsample of migrants – individuals who, 5 years prior to the census, were not living in either their birth state or their current state. We find that married women with young children who returned to their birth states or to their husbands' birth states have substantially higher labor force participation than women who moved to a non-birth state.

Geographical proximity of adult children and their parents has only recently garnered attention in the economic literature.[3] Konrad et al. (2002) model the proximity of adult children to their parents as the outcome of a noncooperative game, but they do not consider childcare or labor supply.[4] Rainer and Siedler (2009) devel-

op and estimate a similar model but, unlike Konrad et al., they discuss labor market effects; they find that adult children without siblings are more likely to remain in their parents' locations and have worse labor market outcomes. These findings are strongest when comparing only children and adults with siblings who grew up in economically depressed regions: the earnings of adults with siblings are ten percent higher on average, and adults with siblings are ten percent more likely to be working full time, compared with only children. They do not investigate the effect of the availability or receipt of childcare on women's labor supply.[5]

Three recent studies consider the effect of childcare by mothers (but not by mothers-in-law) on the labor force behavior of women in Europe, using proximity as an instrument for childcare transfers. Using SHARE data, Dimova and Wolff (2011) use a simultaneous recursive model to estimate the effect of both time and money transfers from mothers on the labor force participation of their daughters in 10 European countries.[6] They include distance between mothers and daughters as well as mothers' demographic characteristics in their childcare equation. They find that regular (weekly or daily) transfers of childcare have a small positive effect on daughter's labor force participation, but do not affect whether their labor force participation is full-time or part-time. Using the same data and a recursive simultaneous equations model, Zamarro (2009) considers the country-specific impact of regular childcare transfers on the labor supply of both mothers and daughters. She finds that regular childcare transfers affect the daughters' labor supply for Greece and the Netherlands, but are insignificant for the other 8 countries. Finally, using French data Dimova and Wolff (2008) find that daughters of first-generation immigrant women at or near retirement age are more likely to participate in the labor force if they receive regular (i.e., weekly) childcare from their mothers. Arpino et al. (2010) do not consider proximity, but estimate the effect of grandparent-provided childcare on the labor force attachment of women in Italy using the number of living grandparents as an instrument for childcare transfers. They find a very large (30 percentage point) positive effect of grandparent care on the probability that a woman is working. Finally, Compton (2013) estimates the direct effect of proximity to mother on the labor force attachment of women in Canada. Compton finds a substantial positive effect of proximity on the probability of work (11 percentage points), only for married women with children under the age of 15.

We argue that the empirical strategy used in the majority of these studies underestimates the effect of childcare availability for two reasons. First, with the exception of Compton (2013), they focus on regular childcare, ignoring the insurance aspect of childcare to meet irregular or unanticipated needs. Second, with the exception of Arpino et al. (2010), they consider only childcare transfers from mothers to daughters because the data sets they use do not include information on mothers-in-law.

We find that the effect of proximity on labor force attachment is strongest for those women living near both mothers and mothers-in-law (in the NSFH data) or living in the birth state of both spouses (in the census data). "Living near neither mother" has a strong negative effect on labor force attachment. The effect of close proximity to only her mother or only his mother is positive, but not robust across samples. In the NSFH, the effect of close proximity to only his mother is positive and significant, while the effect of close proximity to only her mother is insignificant. In the census data,

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[2] Kimmel (1998) finds that the labor supply of unmarried mothers is less responsive to childcare prices than the labor supply of married mothers. Bishop et al. (2009) estimate labor supply elasticities for single women and show that participation wage elasticities for single mothers have declined dramatically between 1980 and 2004, and are much lower than those of married mothers. They estimate a participation wage elasticity for single mothers of 0.68 in 1979, dropping to 0.25 by 2004. In contrast, Blau and Kahn (2007) estimate wage elasticities of married mothers at 0.98–1.04 in 1979–1981 and 0.48–0.54 in 1999–2001.

[3] Klerman and Leibowitz (1990) find a non-significant effect of the availability of relative care on the probability of returning to work within 3 months (and also within 24 months) following the birth of a child. Their analyses, however, focus on coresident mothers rather than mothers in close proximity. Declining rates of coresidence (Costa, 1999; Ruggles, 2007) and the likelihood that coresident mothers may themselves need care (Compton and Pollak, 2009) suggest that the focus on coresidence rather than proximity fails to capture the roles of mothers and mothers-in-law. Several recent theoretical papers consider the effect of intergenerational transfers of time on the labor force behavior of women. Pezzin and Schone (1999) develop a model in which the labor force participation of women and the provision of long-term care to mothers are jointly determined; they focus on the care of frail elderly mothers and do not consider childcare.

[4] In their model, the eldest sibling has the first mover advantage and moves away from the parents to shift the burden of providing long-term care for elderly parents to younger siblings.

[5] Cardia and Ng (2003) calibrate an overlapping generations model that allows intergenerational transfers of both time and money; they show that time transfers involving childcare have substantial positive effects on the labor supply of the middle generation. Belan et al. (2010) develop and analyze an overlapping generations model with intergenerational transfers of care and show that changes in the mandatory retirement age affect the employment rates of both generations.

[6] SHARE, the Survey of Health, Ageing and Retirement in Europe, is a large multi-country panel covering more than 45,000 individuals over the age of 50.

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living in the birth state of either spouse has a significant positive effect on labor force attachment and the magnitudes are about the same. For the military wives sample, we find significant effects on labor force attachment only for couples that live in the birth states of both spouses. Thus, having data on proximity to both mothers and mothers-in-law or on the birth states of both spouses is crucial to understanding the effect of proximity on labor force attachment.

The urban economics literature has documented that married women with young children who work outside the home have shorter commutes than other workers.[7] Madden (1981) compares workers from different types of households and finds that married men with children in the household spend the longest time commuting, while married women with children in the household have the shortest commute times. She argues that these differences reflect the gendered division of labor within the household. White (1986) estimates factors affecting the commute times of household heads in New York City in 1980. She finds that the effect of young children on commute times is positive for both male and female household heads, and concludes that the negative effect of young children on commute times holds only for secondary earners. In a recent paper, Rosenthal and Strange (2012) model the location and commute times of entrepreneurs. They find that women entrepreneurs choose locations with shorter commute times, at the expense of exposure to business agglomeration. Rosenthal and Strange show that gender differences in the location of entrepreneurs can be explained both by lower benefits of agglomeration for women compared with men (due to lower networking) and higher disutility of commute time for women with children compared with men with children. Using census data from 1980 to 2000, Black et al. (2007), find a wide disparity in the labor supply of married women across US cities. They establish that, for both cross-city level comparisons and changes over time, labor force participation rates of married women in the 50 largest MSAs are negatively correlated with the average commute times of married men in these cities.

The well-established finding of shorter commute times for married women with children, especially young children, is consistent with our results. The insurance aspect of family proximity (i.e., having one's mother or mother-in-law nearby to pick up a sick child from school or drive children to after school activities) lessens the disutility of long commute times and, hence, expands the set of jobs acceptable to married women with young children. We find that the proximity of grandmothers who might provide childcare affects the decision to work and the number of hours regularly worked. A plausible hypothesis is that married women with young children who live near to their mothers or mothers-in-law choose longer commute times but our data do not allow us to test this hypothesis.

Our finding that family proximity increases the labor force attachment and employment of married women with young children has implications for policy. The magnitude of the effect of proximity, 5.2–10.4 percentage points, is similar to that found for race and ethnicity. For example, our results suggest that married women are 10.8 percentage points more likely to work if they are black, and 5.1 percentage points less likely to work if they are Hispanic. The magnitudes are also similar to those found for education: women are 2.9 percentage points more likely to work if they are in a power couple (both spouses have a college degree) and 14.7 percentage points more likely to work if they have a college degree but their husband does not, compared with women in low-power couples (neither spouse has a college degree).[8] Our analysis suggests that policies that increase the availability of child-

Table 1
Childcare received by proximity.

	Work related childcare	Not work related childcare	Sample size
Married women			
From her mother			
Near neither mother	4.2	8.6	924
Near only hers	23.7	31.1	506
Near only his	7.0	13.4	497
Near both	26.8	36.8	1125
From his mother			
Near neither mother	2.7	7.4	924
Near only hers	2.9	5.7	506
Near only his	19.4	25.4	497
Near both	18.4	25.0	1125
Unmarried women			
From her mother			
Not near mother	13.5	14.7	144
Near mother	28.6	47.7	274

NSFH Wave II. Weighted percentages. Sample includes all women with children 12 years and under, not coresiding with their mothers, between the ages of 24 and 60, with mother and mother-in-law alive and living in the United States (ALUS). Respondents are asked whether they received work-related or non-work-related childcare in the past month, and if yes, from whom. Work status is current. "Near" is 25 miles or less.

care to meet irregular or unanticipated child care needs, including care for sick children, might substantially increase the labor supply of married women with young children. Our analysis also suggests that increases in the retirement age which reduce the ability of the older generation to provide childcare may reduce the labor force attachment of daughters in the younger generation. Discussing recent trends in labor force participation in the US, Mosisa and Hipple (2006) note that while participation rates have decreased in the past decade for women aged 25–54, they have increased for women aged 55 and older. The behavior of these cohorts is usually analyzed separately, with little or no recognition that geographical proximity and childcare may provide a link between them.

This paper proceeds as follows. Section two describes the NSFH and uses it to analyze the relationship between childcare, proximity and women's labor force attachment. Results from IV and reduced form probit regressions on the probability of being employed support the hypothesis that proximity to mothers or mothers-in-law has a substantial positive effect on the labor force attachment of married women with young children, but not on that of any other demographic group. Tobit and selection correction models on hours of work tell a similar story. We conclude section two by discussing three alternatives to our childcare explanation of the positive association between proximity and the labor force attachment of married women with young children: differences in husbands' incomes; informal job-search networks; and extended childcare networks. At the end of section three we discuss another alternative explanation, tied-mover effects.

In section three we turn to census data. Because the census does not ask about proximity to mothers or mothers-in-law, as a proxy we investigate the effect of living in one's birth state. The results for married women with young children and for military wives reinforce our conclusion that proximity to mothers or mothers-in-law increases the labor force attachment of married women with young children. We also compare the labor force attachment of a subsample of recent migrants: individuals who, 5 years before the census, were not living in either their birth state or their current state. Comparing those who returned to their birth states with those who moved on to another state, we find that those who returned to their birth states have higher labor force attachment.

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[7] Unlike the family proximity literature, the urban literature focuses on time rather than on distance.

[8] We have borrowed the "power couples" terminology from Costa and Kahn (2000).

This finding provides additional support for our inference that proximity increases the labor force attachment of married women with young children. In section four we summarize our findings and conclude.

2. NSFH: proximity and labor force attachment

We use data from the first two waves of the National Survey of Families and Households (NSFH) described in Sweet and Bumpass (1996). The first wave (1987–1988) consisted of 13,007 households, and oversampled blacks, Puerto Ricans, Mexican Americans, single-parent families, families with stepchildren, cohabiting couples, and recently married couples. The second wave (1992–1994) was a 5-year follow-up. Using the first and second waves of the NSFH enables us to control for recent migration (i.e., living in a different location in the second wave than in the first.).[9],[10] The primary respondent was randomly chosen from the adults in the household, but both the respondent and the respondent's spouse or partner were asked to complete the entire survey. The data include information on distance (in miles), health, marital status, education, and transfers given and received by both the respondent's mother and mother-in-law.[11] We limit our sample to those women (respondent or spouse) who are aged 25 to 60 and whose mothers (and mothers-in-law where applicable) are **A**live and **L**iving in the **U**nited **S**tates (ALUS). Thus, we exclude individuals whose mothers or mothers-in-law are deceased or live outside the US.[12] For our analysis, a major advantage of the NSFH is that it provides information on proximity not only to mothers but also to mothers-in-law. Although few data sets include information about family proximity, our results suggest a high scientific payoff to collecting and analyzing information about proximity to both mothers and mothers-in-law.[13]

2.1. Description

Most Americans live very close to their mothers. Using data from the NSFH, Compton and Pollak (2009) report that the median distance between married women and their mothers is 20 miles, with one-quarter living within 5 miles of their mothers. Unmarried women live even closer: the median distance is 8 miles when coresidents are included in the distance calculation and 15 miles when they are excluded.[14] We define 'close proximity' or 'living near' as a distance of 25 miles or less.[15] Close proximity is strongly correlated

with education: 46 percent of low power couples (couples in which neither spouse has a college degree) live within 25 miles of both mothers, whereas only 17% of power couples (couples in which both spouses have college degrees) live within 25 miles of both mothers.

The NSFH provides information on time transfers between individuals and their mothers and mothers-in-law. Respondents were asked whether, in the previous month, they provided or received general help (shopping, errands, transportation, housework, yard work, car repairs and other help around the house) to or from their parents or parents-in-law. Those with children 12 and under were asked whether they received childcare from their parents or parents-in-law while working or childcare at other times (Table 1). The likelihood of time transfers is strongly associated with proximity to both mother and mother-in-law. Of married women with young children living within 25 miles of their mothers, 24–27% received work-related childcare while 31–37% received non-work-related childcare from their mothers; of married women with young children living within 25 miles of their mothers-in-law, 18–19% received work-related childcare and 25% received non-work-related childcare from their mothers-in-law. Unmarried women with young children were slightly more likely to receive transfers of work-related childcare from her mother: 28% of unmarried women with young children in close proximity to their mothers received work-related childcare and almost one-half received non-work related childcare in the past month. Those living further than 25 miles were much less likely to receive childcare: only 4.2% (2.7%) of married women with young children who did not live close to her (his) mother received work-related childcare from her (his) mother.

Employment is also correlated with proximity. Table 2 shows the labor force attachment of married and unmarried women by proximity to their mothers or mothers-in-law. For unmarried women there is a positive relationship between distance category (coresidence, 25 miles or less, more than 25 miles) and full-time work, but an inverted U-shaped relationship between distance category and out of the workforce (the sample size here is a concern, however). This pattern is observed both for unmarried women with young children, and those without young children. For married women, there are four categories of proximity: a couple can live close to neither mother, to his mother only, to her mother only, or to both mothers. The raw data show the importance of including both mothers and mothers-in-law when considering the relationship between proximity and labor force attachment. If we exclude information on mothers-in-law, we are in effect combining the first two categories into a single category ("not close to her mother") and the last two categories into a single category ("close to her mother"). Yet, married women, especially those with children, who live near only their mothers-in-law have a much different pattern of labor force attachment than married women who do not live near either mother; and those who live near only their mothers have a much different pattern of labor force attachment than married women who live near both mothers. For example, restricting our attention to married women with young children, we find a substantially higher percentage working full-time when living near only their mothers-in-law (45%) than living near neither mother (33%). By recognizing four proximity categories, we are able to estimate more precisely the effect of proximity on labor force attachment.

Demographic factors correlated with close proximity are typically factors correlated with lower labor force attachment. Means and standard deviations for the married women's sample are presented in Appendix A. Compared with women who do not live within 25 miles of either mother or mother-in-law, those who live close to both live in areas of higher unemployment, are younger, are more likely to have young children, are less educated, have less educated mothers and spouses, are more likely to be black or His-

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[9] The NSFH does not provide information that would enable us to control for migration prior to wave 1.

[10] The third wave of the NSFH sample was reduced to include only households with children. Because this sample restriction limits our ability to compare across groups, we use only the first and second waves.

[11] We use the information collected from the respondent; if this information is missing, we use the spouse's record.

[12] Although the data are fifteen years old, patterns of migration and proximity appear to be quite stable. For example, the percentages of individuals living in their birth state (our proxy for proximity when using census data) has remained fairly constant over the past three decades.

[13] Using Norwegian data that provides information on the geographical proximity to both mothers and mothers-in-law, Løken, Lommerud and Lundberg (2013) find that couples live closer to his mother than to hers. They attribute this to the "relatively low mobility of men who have not attended college, particularly in rural areas."

[14] In the NSFH analysis, unmarried women include those who are never married, divorced, widowed or separated. We include cohabitors with married individuals.

[15] The results of the analyses are very similar if cutoffs of 20 miles or 30 miles are used. Unless noted otherwise, we include couples who coreside with either her mother or his mother in the 'close' category. Although these couples are qualitatively different from those not coresiding (see Compton and Pollak, 2009), they are a small proportion of the population (2.4% of the sample) and sample sizes are too small to justify a separate category. If we exclude coresidents from the sample of married women, the results are indistinguishable. We treat unmarried women who coreside with their mothers as a separate category because the sample size is larger; 22 percent of unmarried women live with their mothers.

Table 2
Married women's labor force attachment by proximity.

	Does not live near mother	Lives near mother	Coresides with mother
Non married women			
No children 12 and under			
Does not work	19.9	24.2	19.1
Works part-time	16.8	15.6	21.6
Works full-time	63.3	60.3	59.3
Sample size	303	348	92
Children 12 and under			
Does not work	33.5	41.8	30.4
Works part-time	16.0	9.6	23.4
Works full-time	50.5	48.5	35.2
Sample size	144	274	46

	Lives near neither mother	Lives near his mother only	Lives near her mother only	Lives near both mothers
Married women				
No children 12 and under				
Does not work	23.3	28.6	22.0	20.8
Works part-time	17.4	17.1	16.4	16.0
Works full-time	59.4	54.3	61.6	63.3
Sample size	351	216	221	376
Children 12 and under				
Does not work	43.9	33.7	41.1	35.9
Works part-time	23.2	20.7	18.5	22.4
Works full-time	32.9	45.7	40.4	41.8
Sample size	498	314	317	759

NSFH Wave II. Weighted percentages. Sample includes all women aged 25–60 whose mother is ALUS. The sample of married women includes only those for whom both mothers are ALUS. "Near" is 25 miles or less.

panic, and are less likely to live in an MSA. Yet despite these correlates of close proximity, women living in close proximity to their mothers or mothers-in-law are more likely to be working and work more hours. In the next sub-section, we show that the proximity effect observed in the raw data holds under regression analysis.

2.2. Analysis: childcare and labor force attachment

We begin by estimating the effect of predicted transfers of childcare on the labor force behavior of adult women, similar to the type of analysis performed on the European data by Dimova and Wolff (2008,2011) and by Zamarro (2009). The sample is restricted to women with young children whose mothers are ALUS.[16] We estimate the impact of both work-related and non-work related childcare, using the following bivariate probit model:

$$Y_{1i}^* = X_i\beta + Z_i\lambda + Y_{2i}^*\varphi_2 + U_{1i} \qquad (1)$$

$$Y_{2i}^* = X_i\beta + \Lambda_i\gamma_2 + Y_{1i}^*\varphi_1 + U_{2i} \qquad (2)$$

$$Y_{ki}^* = 1 \text{ if } Y_{ki} > 0;\quad k = 1,2$$
$$Y_{ki}^* = 0 \text{ if } Y_{ki} \leqslant 0,$$

where Y_{1i} is an observed dichotomous variable equal to 1 if the daughter works positive hours, (i.e., if the latent variable $Y_{1i}^* > 0$); Y_{2i} is an observed dichotomous variable equal to 1 if the daughter receives childcare (either work related or non-work related) from her mother or her mother-in-law (i.e., if the latent variable $Y_{2i}^* > 0$). The vector X includes exogenous control variables common to both regressions (age, age squared, whether husband works and his hours of work, husband's income, whether self or husband currently has medical problems, race (black, Hispanic, white (omitted)), education categories (both spouses have college degrees, only she has a college degree, only he has a college degree, neither has a college degree (omitted)), age of youngest child, whether

mother has a college degree).[17] The vector Z includes the instruments for work (region (Midwest, South, West, Northeast (omitted)), average commuting time in the county (to account for place-to-place differences in the amount of time it takes to travel), whether residing in an MSA, 1990 county level unemployment rate, and whether the respondent lived in a different city in the first wave of the data). The vector Λ includes the instruments for childcare (age categories of mother(s) (less than 60, 60–69, 70 and over (omitted)), whether mother(s) are in poor health, whether mother(s) are married and whether mother(s) live in close proximity). Error terms are assumed to be iid normal. The variables included in Λ are assumed to affect the likelihood of childcare, but not labor market behavior directly, while variables included in Z are assumed to affect the likelihood of working, but not childcare. The model is estimated using the two-step procedure outlined in Maddala (1983) and Greene (1998).[18]

The parameter of interest is φ_2, the coefficient on predicted childcare in Eq. (1). This is presented in Table 3.[19] We analyze the relationship between proximity and childcare using three definitions of childcare – work-related childcare, non-work-related childcare, and either type of childcare. In the top panel, we show the results for unmarried women. For this sample, transfers of childcare have no discernable effect on the probability of work. For the sample of married women, we first estimate the effect of transfers to and from her mother (ignoring mother-in-law information). In these regressions, the variables in Λ include only those that pertain to her mother, including whether the woman lives in close proximity to

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[16] Women coresiding with their mothers are excluded from the childcare regression samples as transfers between coresidents are not included in the data.

[17] By including husband's hours of work and income as control variables, we assume that these are pre-determined in the wife's labor force decision. We have re-estimated the regressions with these variables excluded and the results do not change.

[18] While this procedure gives consistent estimators, it is not efficient. We use the econometrics software Stata for this analysis, and this software does not allow for a simultaneous bivariate probit estimator with two endogenous variables. Standard errors are estimated using a bootstrap procedure.

[19] In all regressions, coefficients are presented with standard errors in parentheses. Marginal effects on the predicted probability are shown in italics.

Table 3
Bivariate probit model: the impact of childcare on positive hours of work.

	(A) Received work-related childcare	(B) Received non-work related childcare	(C) Received either work-related or non-work related childcare
Unmarried women with children 12 and under (367 observations)			
Childcare from her mother			
Coefficient	0.068	−0.019	−0.007
Bootstrapped standard error	(0.182)	(0.073)	(0.140)
Bootstrapped Marginal effect	*0.024*	*−0.007*	*−0.002*
Confidence interval (95%)	(−0.318, 0.334)	(−0.155, 0.312)	(−0.322, 0.266)
Bootstrapped Wald coef.	1.287	−0.133	−0.055
Married women with children 12 and under (1567 observations)			
Childcare from her mother			
Coefficient	0.079	0.080	0.071
Bootstrapped standard error	(0.052)	(0.050)	(0.042)
Bootstrapped Marginal effect	*−0.012*	*−0.007*	*−0.011*
Confidence interval (95%)	(−0.019, 0.178)	(−0.025, 0.159)	(−0.027, 0.143)
Bootstrapped Wald coef.	1.565	1.604	1.646
Childcare from either mother			
Coefficient	0.165	0.165	0.136
Bootstrapped standard error	(0.057)	(0.061)	(0.047)
Marginal effect	*0.062*	*0.062*	*0.051*
Confidence interval (95%)	(0.066, 0.273)	(0.068, 0.319)	(0.063, 0.253)
Bootstrapped Wald coef.	2.92	2.953	2.908

NSFH Wave II. The sample includes all married and unmarried women, aged 25–60 inclusive, with children 12 and under, for whom both mother (and mother-in-law if applicable) are ALUS.

her mother. The results show positive, but insignificant coefficients on predicted childcare. The bottom panel adds the information on mother-in-law.[20] Here, the variables in Λ include the age, marital status and health of both mothers and the proximity categories are close proximity to his mother only, close proximity to her mother only and close proximity to both. The results show that married women who receive transfers of childcare from either their mother or mother-in-law are more likely to work in the paid labor force than those who do not receive such transfers. Marginal effects are significant, ranging from 5.1 to 6.2 percentage points, depending on the definition of childcare. The effect is significant for both work-related and non-work related childcare.[21] We interpret the significance of non-work-related transfers as suggesting an insurance effect of proximity – the availability of family members to provide childcare in unanticipated situations alters the labor supply of married women with young children.

We next investigate the reduced form relationship between proximity to mothers and mothers-in-law and the labor force behavior of women, maintaining the assumption that proximity is exogenous. We highlight the reduced form analysis for two reasons. First, the childcare variable in the NSFH indicates only whether a woman received childcare from her mother or mother-in-law in the previous month. The IV analysis will underestimate the insurance aspect of childcare if the mother or mother-in-law is available for childcare, but no transfers were re-

ceived during the survey month. Second, applying the reduced form equation to demographic groups without childcare needs allows us to test our hypothesis that the availability of childcare is the mechanism that links proximity and labor force attachment.

Using the notation above, we estimate

$$Y_{1i}^* = X_i\beta + Z_i\lambda + \Lambda_i\gamma + U_i \qquad (3)$$

as a reduced form probit regression on employment. We also estimate Tobit regressions with Y_{1i} denoting hours of work.

We now expand our sample to include all women, not only those with children under the age of 12.[22] For married women, we focus on the effect of three categorical variables: close proximity (i.e., within 25 miles) of mothers only, of mothers-in-law only, and of both mothers and mothers-in-law. For unmarried women, we consider the effect of coresidence and of close proximity to mothers. To simplify the interpretation, we limit the sample to those with mothers (and mothers-in-law for the married sample) ALUS.[23] Control variables indicating the presence of children (children 12 and under, only children older than 12, no children (omitted)) are added to vector X.[24]

Probit results for key variables are shown in Table 4 (with full regression results included as Appendix D. In columns (1) and (3) we estimate the effect of living near own mother, ignoring the location of mother-in-law. As with the IV regressions, we find positive but insignificant effects of proximity when the comparison group contains both those living near neither mother and those living near their mother-in-law only. When mother-in-law information is added in columns (2) and (4), the comparison group

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[20] There is no econometric procedure to allow for a two-step IV approach with a multinomial endogenous variable (childcare from her mother only, from his mother only, from both).

[21] The categories of childcare (columns A and B) are not mutually exclusive. For unmarried women, 63 percent of those who received work-related childcare also received non-work related childcare; 40 percent of those who received non-work related childcare also received work-related childcare. For married women, 77 percent of those who received work-related childcare from either mother or mother-in-law also received non-work related childcare; 58 percent of those who received non-work related childcare from either mother or mother-in-law also received work-related childcare.

[22] The regressions were re-estimated using the sample of women aged 25–45 only. The results do not change.

[23] By excluding those whose mothers are not ALUS, our sample under-represents migrants to the US and those whose mothers die young.

[24] These are mutually exclusive categories. The category "only children older than 12" includes women with older children at home and those who have older children living elsewhere. These groups are combined for sample size. The category "no children" includes only those women who have never had children.

Table 4
Probit and tobit regression results.

	Married women				Unmarried women	
	Probit: positive hours of work		Tobit: usual weekly hours of work		Probit: positive hours of work	Tobit: usual weekly hours of work
	(1)	(2)	(3)	(4)	(5)	(6)
Coreside with mother	–	–	–	–	−0.228* (0.120) −0.073	−4.103* (2.203)
Lives near own mother	0.046 (0.075) –		0.183 (1.630)		−0.096 (0.106) –	−2.013 (1.321)
Lives near own mother only		0.008 (0.081) –		−1.076 (1.752)		
Lives near spouse's mother only		0.151* (0.098) 0.052		3.519* (2.045)		
Lives near both mothers		0.211** (0.092) 0.073		3.429* (1.897)		
Pr(Y = 1|X)	0.685	0.685			0.770	
Y (fitted values)			19.32	19.29		28.14
Observations	2521	2513	2517	2509	1637	1637
Wald chi2	407.33	380.05	1124.14	1947.90	190.8	243.0
(DF)	(30)	(38)	(30)	(38)	(24)	(24)
Pseudo R^2	0.082	0.087	0.017	0.018	0.081	0.013

NSFH Wave II. Coefficients are presented, with bootstrapped standard errors in parentheses. Marginal effects are in italics, presented if the coefficient is significant at the 80 percent confidence level. The sample includes all individuals in the marriage category, aged 25–60 inclusive, for whom both mother (and mother-in-law if applicable) are ALUS. The unmarried sample includes all individuals who are currently divorced, separated, widowed or never married. Control variables included in the regressions, but not presented here for space considerations include age, age squared, whether spouse works and his/her hours of work, whether self or spouse currently has medical problems, spouse's income, race (Black, Hispanic, White (omitted)), education categories (both spouses have college degrees, only she has a college degree, only he has a college degree, neither has a college degree (omitted)), children 12 and under present in the household, only children over 12 present in the household, children outside the household, whether mother has a college degree, region (Midwest, South, West, Northeast (omitted)), average commuting time in the county, whether residing in an MSA, 1990 county level unemployment rate, whether coresides with mother or mother-in-law, age categories of mother(s) (less than 60, 60–69, 70 and over (omitted)), whether mother (or mother-in-law) is in poor health, whether siblings live within 25 miles.

becomes those living away from both mothers and we now see a statistically significant and relatively strong effect of proximity to mothers-in-law and to both mothers. Married women are 5–7 percentage points more likely to work, and work approximately 3.5 more hours per week if they live in close proximity to her mother or mother-in-law. These marginal effects are comparable to those found for race (compared with married white and other women, married black women are 10 percentage points more likely to work while married Hispanic women are 5 percentage points less likely to work); married women with self-reported medical problems are 5 percentage points less likely to work. The effects are not as strong as those found for the presence of young children or education. Our results on average commuting time in the county or MSA are similar to those of Black et al. (2007) – a 10 min increase in the average commuting time reduces the probability of work by 0.3 percentage points – but our results for the effects of average county or MSA commuting times are not statistically significant. For unmarried women with young children, we find no effect of proximity, and a negative effect of coresidence, on work force attachment. We replicated these regressions for married and unmarried men with young children and found no significant effect of close proximity on men's labor force attachment.

In Table 5 we consider different subsamples of married women to determine the subgroups for which the relationship between proximity and labor supply is strongest.[25] The first column presents the full sample results from the regression in Table 4, column (2). In columns (2)–(4), we report the regressions separately by presence of child categories: column (2) includes only those with young chil-

dren; column (3) includes only mothers without young children; and column (4) includes only non-mothers.[26] Proximity is significant only for those with young children and the effect is large; close proximity to mother-in-law or to both mother and mother-in-law increases the predicted probability of employment by 10 percentage points. The coefficient on close proximity to only her mother is positive, but insignificant.

In columns (5) and (6) we limit the sample to those whose mothers or mothers-in-law are in poor health and thus are more likely to need care themselves and less likely to provide care for their grandchildren. We find no effect of proximity on the labor force attachment of these women. The absence of an effect of proximity on the labor supply of women whose mothers or mothers-in-law are in poor health is further evidence that the availability of childcare is probably the mechanism through which proximity affects labor supply.

Proximity to mother-in-law and proximity to both mothers have similar effects: proximity to only one's own mother has a smaller and statistically insignificant effect. This result is unexpected, as women are more likely to receive childcare transfers from their mothers than from their mothers-in-law. In Section 5, using census data and birth state residence as a proxy for proximity, we find that proximity to mother and proximity to mother-in-law are statistically significant and that the effect sizes are about the same.

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[25] We found similar results when we included interaction terms between proximity and children or health of mother or mother-in-law in the regression.

[26] The results are qualitatively the same if we consider those with children under the age of 6. We chose the 12 year old cut-off for two reasons. First, this cut-off corresponds to the NSFH childcare transfer questions – only those with children 12 and under were asked about childcare. Second, our hypothesis is that the availability of family to aid with irregular or unanticipated childcare needs is important for labor market decisions. This type of childcare may be especially important when children are school-age.

Table 5
Probit regressions, dependent variable: positive hours of work sample: married women, with both mother and mother-in-law ALUS.

	All (1)	Children 12 and under in household (2)	Mothers without young children in household (3)	Non-mothers (4)	Her mother in poor health (5)	His mother in poor health (6)
Lives near her mother only	0.008 (0.081) –	0.097 (0.132) –	−0.067 (0.228)	−0.093 (0.370) –	−0.090 (0.406) –	0.081 (0.309) –
Lives near his mother only	0.151* (0.098) *0.052*	0.280*** (0.094) *0.104*	−0.190 (0.229) –	0.224 (0.308) –	−0.034 (0.466) –	0.004 (0.316) –
Lives near both mothers	0.211** (0.092) *0.073*	0.266** (0.110) *0.101*	0.118 (0.247) –	−0.020 (0.407) –	0.085 (0.454) –	0.077 (0.372) –
Children 12 and under	−0.548*** (0.082) *−0.186*				−0.588* (0.311) *−0.188*	−0.547 (0.463) *−0.182*
Her siblings within 25 miles	0.055 (0.082) –	−0.014 (0.102) –	0.063 (0.148) –	0.572** (0.266) *0.147*	0.131 (0.338) –	−0.069 (0.377) –
His siblings within 25 miles	−0.161* (0.068) *−0.057*	−0.144 (0.091) *−0.055*	−0.082 (0.132) –	−0.349 (0.375) –	−0.181 (0.242) –	0.121 (0.310) –
$Pr(Y = 1 | X)$	0.685	0.609	0.713	0.831	0.719	0.699
Observations	2513	1564	589	356	318	286
Pseudo R^2	0.087	0.066	0.139	0.188	0.165	−0.206

NSFH Wave II. Coefficients are presented, with standard errors in parentheses. Marginal effects on the predicted probability are italicized and listed for those coefficients that are statistically significant at the 80 percent confidence level. The sample includes all individuals in the marriage category, aged 25–60 inclusive, for whom both mother are ALUS. Full control variables are included in all regressions, see footnote from Table 4 for the list of controls.

The effect of nearby siblings suggests that strategic behavior may explain why proximity to mother-in-law has a stronger estimated effect than proximity to mother. Consider first the mother-in-law. Because mothers-in-law are more likely to provide childcare for the children of their own daughters than for those of their daughters-in-law, the presence of his siblings may reduce mothers-in-law willingness to provide childcare. On the other hand, if there are no siblings in close proximity, mothers-in-law may have a stronger incentive to provide childcare transfers than mothers. Because altruistic motives for providing eldercare are presumably weaker among daughters-in-law than daughters, mothers-in-law may be more willing to provide childcare to daughters-in-law in the hope of increasing the probability of receiving eldercare in the future. In the first column we find a positive effect of living close to one's mother-in-law but a negative effect of close proximity to husband's siblings.[27] The negative effect of nearby siblings is also seen for the subgroup with young children, although these coefficients just fail to meet standard levels of significance. Strategic behavior may also explain the insignificant effect of close proximity to only her mother. Compared with couples residing in close proximity to both mothers, those residing in close proximity to only her mother may be more likely to move away in the future, thus reducing the incentives of mothers to provide childcare. The close proximity of a woman's own siblings has a negative but non-significant effect on the labor force attachment of women with young children, and a positive effect on the labor force attachment of those without children. These results suggest a relationship between labor force attachment and sibling competition in care transfers, but we do not have sufficient data to investigate this possibility more thoroughly.

The results on hours of work from Tobit regressions and models using a Heckman correction for sample selection indicate that the effect of proximity is primarily on the extensive margin (i.e., whether the woman works or not) rather than on the intensive margin (i.e., the number of hours worked). These results (not shown) are consistent with the probit results: we find proximity effects only for married women with young children.

We consider four alternatives to the childcare explanation of the positive association between proximity and the labor force attachment of married women with young children: (a) differences in husbands' incomes, (b) informal job-search networks, (c) extended childcare networks, and (d) tied-mover effects. We discuss husbands' incomes, informal job search networks and extended child care networks in this section, and tied-mover effects in Section 3.2.

We discount the husbands' incomes as an explanation of our proximity results because we have included husbands' incomes, hours of work, work status and education as control variables in all of our regressions. The raw data show that married women who live in close proximity to their mothers or mothers-in-law have husbands with lower incomes than those who live far from both. Husbands are also more likely to work and work more hours when the couple lives far from both mothers, compared to those living close to either mother or mother-in-law. A joint model of household labor force attachment would predict, based on this information, that married women living away from both their mothers and their mothers-in-law would have lower labor force attachment than those living close. But the fact that this relationship persists after controlling for husbands' income, hours of work, work status and education makes this an unlikely alternative to the child care explanation.

We discount the informal job-search networks explanation of our proximity results because we find an effect of proximity only for married women with young children. We do not find a proximity effect for men, for unmarried women, or for married women without young children. Even if we postulate that the labor force attachment of married women with young children is more sensitive than that of other demographic groups to the presence of a more extensive job search network, we would expect to find *some* job search network effect for other groups. The absence of such effects argues against the job search network explanation.

We are skeptical of the extended child care network explanation of our proximity results, but we cannot rule out the possibility that proximity to mother and mother-in-law is a proxy for extended childcare networks involving aunts, uncles, cousins, and friends. Three points need to be made. First, after controlling for a woman's proximity to her mother, proximity to her siblings has

[27] We do not know whether siblings in close proximity are brothers or sisters.

no effect on her labor force attachment, while proximity to her husband's siblings has a negative effect. This suggests that there is no additional increase in labor force attachment associated with living in close proximity to other family members. Second, the connection between proximity and labor force attachment is not observed when mothers are in poor health. Finally, using data from the Survey of Income and Program Population (SIPP), Laughlin (2010) shows that grandparent provided childcare is three times more prevalent than care provided by other relatives – that is, grandparents provide a disproportionate share of nonparental childcare. However, the "insurance" story (e.g., having someone to pick up a sick child at school) could be told about aunts, uncles, cousins and friends, and we have argued that the importance of such insurance is not necessarily reflected in the number of hours of child care provided. Hence, although we are skeptical of the extended child care network story, we cannot rule it out.[28]

Overall, our findings from the NSFH indicate that proximity to mothers or mothers-in-law has a large positive effect on the labor force attachment of married women with young children. The IV analysis suggests that the mechanism through which proximity and labor force attachment are linked is childcare; the lack of a proximity effect for married women without childcare needs reinforces this result. Our estimation of the marginal effect of the availability of childcare is higher than the European results of Dimova and Wolff (2008, 2011) and Zamarro (2009). We attribute this to our ability to distinguish both proximity to mother and proximity to mother-in-law, and to the focus of the European studies on regular childcare transfers. Our marginal effects are just slightly smaller than those found by Compton (2013) using Canadian data.[29]

Two caveats are required. The first is sample size: perhaps the insignificant results for married women with older children and for married women with no children are due to the small sub-samples. We address this concern in Section 3 by using census data. The second is the potential endogeneity of proximity. Endogeneity problems arise if women who have preferences for both children and labor force attachment are more likely to reside near family, compared with women who have preferences for one or the other.[30] Unfortunately, we have no convincing way to deal with this endogeneity problem using the NSFH data.[31] Nevertheless, our empirical results from the NSFH provide strong evidence that proximity is related to the labor force attachment of married women with young children, and that the mechanism is the availability of childcare. Census data address the endogeneity concerns and provide additional evidence.

3. Census data: birth state and labor force attachment

Although the U.S. Census does not ask respondents the distance to their mothers, it does ask whether the respondent resides in his or her birth state. We use this variable as a proxy for close proximity. Using U.S. Census data, Rosenbloom and Sundstrom (2003) use residence in birth state to analyze migration patterns from 1850–1990. Their results are broadly consistent with ours. Approximately 60–65 % of the sample live in their birth state, gender differences are not observed by the end of their sample, and the probability of living in one's birth state is negatively correlated with age and education. Data from the Panel Study of Income Dynamics (PSID) provides some support for the validity of this proxy.[32] The PSID reports grouped distance to mother in 1 year (1988) and the "State where the Head (Spouse) grew up."[33] Although the state where one grows up need not coincide with birth state, there is a strong link between proximity and residing in one's childhood state: in the PSID, more than 90% of heads currently living in their childhood state are living in the same state as their mothers; over half live within 10 miles, and less than 15% live more than 100 miles away. On the other hand, of those heads not living in their childhood state, only 27% currently live in the same state as their mothers; 16% live within 10 miles, and more than 70% live more than 100 miles away.

Using census data we estimate the effect of birth state residence on the probability of employment and labor force participation as well as on usual weekly hours. More specifically, using the public use microdata files of the 2000 U.S. Census, we construct a dataset that includes all women aged 25–45 who were born in the US (Ruggles et al., 2009). For married women, we define three mutually exclusive indicator variables: (1) whether the couple lives in the birth state of both spouses; (2) whether the couple lives in only her birth state; and (3) whether the couple lives in only his birth state. To control for migration effects, we include a dummy variable for whether the woman was in the same state 5 years previously. We also include controls for the geographic size of the current state; we do this because those living in large birth states (e.g., Texas, California) may well have moved within the state and, hence, living in a large birth state is likely to be a weaker proxy for proximity to mother than living in a small birth state (e.g., Rhode Island, Delaware). In contrast, those living in small birth states, even if they have moved within the state, are more likely to live in close proximity to mother. Because the census provides no information on mothers who do not reside with their adult children, we limit the sample to those aged 25–45 (in the NSFH analysis we used those aged 25–60) to increase the likelihood that the mothers of those in our census sample are still alive.[34]

We replicate the analysis using a large sample of military wives – civilian women with husbands serving in the US military.[35] Our military wives sample includes 14,833 married women, of whom 10.2% live in only her birth state, 5.1% live in only his birth state, and 8.7% live in the birth state of both spouses. The military wives provide a control for endogeneity because their husbands' locations

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[28] Using Canadian data, Compton (2013) extends the analysis to include a more direct test of the extended childcare network hypothesis by including in the sample women with living fathers and deceased mothers, defining proximity to the father. She finds a positive effect of close proximity to family on the labor force attachment of married women with children only when the mother is alive. The sample used by Compton includes only women over the age of 45. With the younger sample in the NSFH, there are very few observations of mothers with young children who have living fathers and deceased mothers. We have estimated the same regressions, but the results are insignificant.

[29] Although Compton uses a similar methodology in focusing on proximity rather than childcare transfers, mother-in-law location is not available in the Canadian data. As noted earlier, this exclusion is likely to cause an underestimation of the proximity effect. Still, Compton finds that married women with children who live in close proximity to their mothers are 11 percentage points more likely to work than those who live more than half a day away.

[30] Endogeneity problems also arise if marriage market choices reflect underlying preferences for work/children combinations.

[31] We attempted a bivariate probit model as outlined above in Eqs. (1) and (2), but defining Y_{2i} as an observed dichotomous variable equal to 1 if the daughter lives in close proximity to his mother or to her mother (i.e., if the latent variable $Y_{2i}^* > 0$). The instruments included were mother's marital status and indicators for only and eldest child. We do not present the results for two reasons. First, the results are insignificant and sensitive to control inclusion, which may reflect the use of a binary proximity category that ignores the location of mothers-in-law. Second, although mother's marital status and birth order are strong predictors of proximity in previous work (e.g., Konrad et al. (2002), Rainer and Siedler (2009), Compton and Pollak (2009)), we found them to be borderline weak instruments, especially in sub-samples.

[32] The NSFH does not include state of birth.

[33] The PSID did not ask state of birth until 1993, and then only to new heads or spouses. The distance groups in the PSID are (1) less than one mile; (2) 1 to 10 miles; (3) 11 to 100 miles; and (4) more than 100 miles.

[34] Summary statistics for the census data are presented in Appendices B and C.

[35] Excluded from the sample are those for whom spouse is absent. In particular, this excludes military wives whose husbands are serving overseas. To increase the size of the military wives sample, we have increased the age range to 18–45. We find similar results when we omit the 18–23 age category.

Table 6
Summary statistics for three U.S. Census samples.

	Married			Military wives			Never married		
	With children12 and under	With only older children	No children in the household	With children 12 and under	With only older children	No children in the household	With children 12 and under	With only older children	No children in the household
Sample Size	675,850	172,114	204.058	10.578	1,120	3,135	73,813	16,336	226,000
In Birth State	63.84%	66.96%	59.94%	18.95%	20.54%	19.40%	75.61%	74.54%	71.49%
Couple Residing in									
Hers Only	15.44%	14.11%	15.69%	10.24%	9.29%	10.85%			
His Only	12.86%	12.61%	13.29%	5.08%	5.71%	5.39%			
Both	48.40%	52.85%	44.25%	8.71%	11.25%	8.55%			
In the Labor Force									
Neither	0.64	0.79	0.85	0.53	0.75	0.79	0.78	0.77	0.87
His only	0.70	0.80	0.85	0.57	0.80	0.85			
Hers only	0.69	0.80	0.85	0.60	0.81	0.84	0.74	0.72	0.81
Both	0.71	0.80	0.83	0.62	0.83	0.79			
Employed									
Neither	0.62	0.76	0.82	0.49	0.71	0.72	0.70	0.70	0.83
His only	0.68	0.78	0.82	0.54	0.78	0.78			
Hers only	0.66	0.77	0.83	0.56	0.79	0.76	0.65	0.65	0.76
Both	0.68	0.78	0.81	0.59	0.81	0.75			
Usual Weekly Hours									
Neither	25.13	31.6	37.2	22.50	30.34	34.59	32.44	32.89	37.76
His only	27.08	32.0	36.3	24.11	30.25	34.96			
Hers only	26.73	31.9	36.5	25.36	29.32	33.81	30.45	29.90	33.82
Both	26.91	31.4	35.1	25.55	31.93	34.28			

U.S. Census 2000. The samples includes all married and single never married women aged 25–45, born in the US, non-students. The military wives sample includes all women aged 18–45, non-students, born in the US whose husbands are employed in the US military.

are determined by the military.[36] Lleras-Muney (2010) provides evidence supporting the claim that migration by military personnel is largely exogenous to their preferences. She notes that although slightly more than one-third of military personnel reported that they were assigned to their preferred location, this figure is biased upwards by the common, encouraged practice of listing preferences that are in-line with the preferences of the military. Lleras-Muney stresses that in practice, enlisted personnel are not generally assigned to their preferred location.[37]

3.1. Interaction of birth state and young children

We consider the impact of birth state residence for three samples – married women, military wives, and never-married women.[38] Table 6 presents summary statistics for the samples. The data indicate that, for married women with young children, there is an increasing attachment to the work force as we move from residing in the birth state of neither spouse to residing in the birth state of both spouses. We find no discernable pattern for married women with only older children or no children. We find a similar pattern for military wives with young children, although the patterns for military wives with older or no children are less clear. For never married women with young children, we find a negative relationship between birth state residence and labor force attachment.

In Table 7 we present regressions analogous to Eq. (3).[39] That is, we estimate the effect of birth state residence (our proxy for family proximity) on labor force attachment – whether the woman is currently in the labor force and whether she is currently employed.[40] For married women with no young children, we find a small negative effect of birth state residence, but for married women with young children, we find a positive effect. Proximity has a small, negative effect on the labor force attachment of never married women regardless of whether they have young children. The marginal effects are smaller in the census than in the NSFH sample but the effect remains substantial: birth state residence increases the probability of labor force participation and employment of married women with young children by 2.6–3.9 percentage points. In Table 8, we expand the birth state categories to account for residence in his and her birth state separately. Results for the full sample of married women are

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[36] The probability that they live near only her mother is twice the probability of living near his mother, presumably because it is the husbands' locations that are determined by the military. In particular, if the wife met her husband while he was in the military and stationed in her birth state, then the couple is more likely to live near her mother than near his mother. Unfortunately, the census does not ask how long couples have been married.

[37] Lleras-Muney notes that junior ranking soldiers have the least control in location choices, and she drops officers from her sample to further remove any choice in location. In the census data, occupation of military members lines up with civilian occupations, unless the occupation is specific to the military. As a result, we are unable to clearly identify officers.

[38] In the NSFH sample we included all unmarried women with controls for divorced, separated and widowed. With the large sample size available in the IPUMS data, we are able to consider separately those previously married and those never married. The results for those previously married are more difficult to interpret since the women may still reside near their mothers-in-law and receive childcare from them.

[39] Due to computing demand, a random 10% sample was drawn for the regressions.
[40] Regression results from Tobit and Heckman corrected models on usual weekly hours again suggest that the impact of proximity is on the extensive margin. The results of these regressions are not presented but are consistent with the probit results.

Table 7
Probit regressions: impact of birth state on labor force attachment.

	Married women		Military wives		Never married women	
	In labor force (1)	Employed (2)	In labor force (3)	Employed (4)	In labor force (5)	Employed (6)
Living in birth state	−0.058***	−0.052***	−0.058	−0.026	−0.039**	−0.041**
	(0.012)	(0.012)	(0.059)	(0.026)	(0.017)	(0.016)
	−0.008	−0.009	–	–	−0.008	−0.014
Children 12 and under	−0.615***	−0.570***	−0.827***	−0.739***	0.012	−0.056**
	(0.012)	(0.012)	(0.033)	(0.032)	(0.028)	(0.027)
	−0.159	−0.155	−0.277	−0.266	−0.008**	−0.011
Birth state × Children 12 and under	0.128***	0.122***	0.099	0.070	0.030	0.013
	(0.014)	(0.014)	(0.066)	(0.064)	(0.032)	(0.030)
	0.039	0.039	0.032	0.026	–	–
Prob($Y = 1|X$)	0.751	0.728	0.633	0.582	0.841	
Observations	210004	210004	14,833	14,833	63,182	63,182
LRchi2	17887.84	18428.96	1955.10	1968.20	9035.17	10939.58
(DF)	(33)	(33)	(33)	(33)	(28)	(28)
Pseudo R^2	0.074	0.073	0.099	0.097	0.146	0.155

U.S. Census 2000. Coefficients presented with standard error in parentheses and marginal effect on the predicted probability in parentheses. The sample includes all married and never married women aged 25–45, born in the US, non-students. The regressions use a random 10% sample. The military wives sample includes all women aged 18–45, non-students, born in the US whose husbands are employed in the US military. The full set of controls are included in each regression. These include age, age squared, children (children 12 and under, only children over 12 in the household, no children in the household (omitted)), education (less than high school, high school diploma (omitted), more than high school, bachelor's degree, more than bachelor's degree), spouse education (groups same), disability, spouse disability, race (Black, Hispanic, white (omitted)), rented accommodations, whether in a metropolitan area, total income of spouse, whether in different state 5 years prior, size of current state (square miles), US region.

Table 8
Probit regressions: impact of birth state on labor force attachment.

	Married women		Military wives	
	In labor force (1)	Employed (2)	In labor force (3)	Employed (4)
Living in only her birth state	−0.045**	−0.050***	0.023	0.020
	(0.019)	(0.018)	(0.077)	(0.783)
	−0.012	−0.011	–	–
Living in only his birth state	−0.067***	−0.048**	0.080	0.036
	(0.019)	(0.019)	(0.104)	(0.709)
	−0.011	−0.014	–	–
Living in birth state of both	−0.088***	−0.069***	−0.140	−0.075
	(0.015)	(0.014)	(0.080)	(0.078)
	−0.013	−0.016	–	–
Children 12 and under	−0.668***	−0.131***	−0.821***	−0.735***
	(0.015)	(0.021)	(0.034)	(0.033)
	−0.158	−0.155	−0.277	−0.266
Her Birth State × Children 12 and under	0.128***	0.131***	0.018	0.018
	(0.022)	(0.021)	(0.087)	(0.083)
	0.040	0.042	–	–
His birth state × Children 12 and under	0.160***	0.141***	−0.102	−0.056
	(0.023)	(0.022)	(0.119)	(0.113)
	0.049	0.046	–	–
Both birth state × Children 12 and under	0.202***	0.184***	0.176**	0.122
	(0.017)	(0.016)	(0.091)	(0.088)
	0.061	0.060	0.053	0.042
Prob($Y = 1|X$)	0.751	0.728	0.633	0.582
Observations	210004	210004	14,833	14,833
LRchi2	17967.33	18499.93	1958.33	1969.41
(DF)	(37)	(37)	(37)	(37)
Pseudo R^2	0.074	0.074	0.099	0.097

U.S. Census 2000. Coefficients presented with standard error in parentheses and marginal effect on the predicted probability in parentheses. Sample and control variables are as described in Table 8.

consistent – a small, negative effect of living in the birth state of one or both spouses for those without young children, but a strong positive effect of living in the birth state of either or both spouses for those with young children.

The results from the military sample are weaker: the results in Table 7 indicate a positive effect of birth state residence for those with young children, although the significance levels are relatively low.[41] In Table 8, with expanded birth state categories, the interaction between children and birth state residence is positive and significant only for those residing in the birth state of both spouses. We expect weaker results in the military wives sample for two reasons. First, birth state residence is a weaker proxy for family proximity when the husband is in the military because military personnel assigned to their birth states are likely to be further from their mothers than civilians who live in their birth states. Second, the strategic motivation for mothers and mothers-in-law to provide childcare in anticipation of reciprocity when they are elderly and disabled is reduced because daughters and daughters-in-law are likely to move when their husbands are assigned to a different location.

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[41] For the labor force and employment participation probits, the coefficients on the interaction terms are significant at the 89% and 78% confidence levels, respectively.

Table 9
Employment and labor force participation by state of residence 5 years prior.

	Non-migrants			Migrants		
	(A) In birth state	(B) Not in birth state	(C) Difference for non-migrants (A)–(B)	(D) Into birth state	(E) Not into birth state	(F) Difference for migrants (D)–(E)
Married with children 12 and under						
Employed	0.683	0.671	0.013***	0.581	0.535	0.054***
In labor force	0.704	0.689	0.016***	0.608	0.552	0.055***
Married with children over 12 only						
Employed	0.780	0.778	0.002	0.688	0.712	−0.024**
In labor force	0.801	0.799	0.001	0.723	0.749	−0.025**
Married with no children in household						
Employed	0.815	0.825	−0.010***	0.803	0.816	−0.013**
In labor force	0.838	0.847	−0.009***	0.837	0.849	−0.012*
Single never married (SNM) with children 12 and under						
Employed	0.652	0.696	−0.044***	0.666	0.722	−0.056***
In labor force	0.743	0.775	−0.032***	0.776	0.801	−0.025*
SNM with children over 12 only						
Employed	0.652	0.697	−0.045***	0.622	0.724	−0.103**
In labor force	0.721	0.761	−0.040***	0.703	0.823	−0.121***
SNM with no children in household						
Employed	0.762	0.815	−0.053***	0.807	0.869	−0.062***
In labor force	0.804	0.851	−0.046***	0.858	0.905	−0.047***

U.S. Census 2000 unweighted IPUMS sample. Includes all women aged 25–45 and born in the US. The sample of migrants includes those who lived outside their birth state 5 years prior to the census, and have since migrated across states.

Table 10
Probit regressions: labor force participation sample: women who did not reside in their birth state 5 years prior to the census.

	Married women				Never married women			
	All (1)	Children 12 and under (2)	Only children over 12 (3)	No children in the household (4)	All (5)	Children 12 and under (6)	Only children over 12 (7)	No children in the household (8)
Omitted case: (A) Non-migrant								
(B) Return migrant: moved into birth state	−0.189***	−0.183***	−0.179***	−0.166***	0.014	0.164*	−0.353	−0.028
	(0.021)	(0.025)	(0.069)	(0.054)	(0.042)	(0.084)	(0.236)	(0.050)
	−0.061	−0.066	−0.049	−0.036	–	0.164	−0.100	–
(C) Onward migrant: moved into another state	−0.291***	−0.332***	−0.201***	−0.200***	0.012	−0.008	−0.153	0.011
	(0.015)	(0.018)	(0.049)	(0.036)	(0.037)	(0.084)	(0.235)	(0.042)
	−0.095	−0.119	−0.055	−0.043	–	–	–	–
Children 12 and under	−0.574***				−0.054*			
	(0.014)				(0.031)			
	−0.187				−0.011			
Only children over 12 in the household	−0.154***				0.100*			
	(0.019)				(0.056)			
	−0.050				0.020			
Chi2: test (C) = (E)	17.46	26.81	0.07	0.32	0.00	2.38	0.39	0.43
Prob > chi2	0.000	0.000	0.788	0.574	0.959	0.123	0.531	0511
Pr(Y = 1|X)	0.739	0.676	0.806	0.866	0.880	0.790	0.796	0.901
Observations	74,036	47,592	11,233	15,211	19,306	3,520	796	14,990
Pseudo R^2	0.080	0.633	0.645	0.103	0.158	0.078	0.103	0.180

U.S. Census 2000. Coefficients are presented with standard errors in parentheses, marginal effects in italics if *p*-value is less than 0.2.
Sample: A twenty percent random sample of all women aged 25–45, born in the US who were not living in their birth state 5 years prior to the census. The full set of controls, as described in Table 8, is included in each regression.

3.2. Migration: origin/destination effects

In this section we investigate origin/destination effects for migrants. We consider a subsample of "recent migrants" by which we mean individuals who, 5 years prior to the census, were not living in either their birth state or their current state. We find that those who returned to their birth states have substantially higher labor force attachment than those who moved to another state.

In Table 9 we show the employment and labor force attachment rates for migrants and non-migrants. We limit our sample of migrants to those who were not living in their birth state 5 years ear-

lier because we want to distinguish between the labor force attachment of those who returned to their birth states (return migrants) and those who moved to a state other than their birth state (onward migrants).[42] For married women with young children, non-migrants have higher labor force attachment rates and higher employment rates than migrants, which is consistent with the tied-mover hypothesis. Within the group of migrants, however, the participation and employment rates of married women with young

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[42] We cannot identify individuals who moved between states within the five year window and then returned, nor can we identify those who moved within state.

children who return to their birth state are 5.5 percentage points higher than that of their counterparts who migrate to another state. For the other samples – unmarried women, married women with no children, and married women with only older children – return migrants have lower labor force participation and employment rates than onward migrants.

In Table 10 we use regression analysis to further investigate these origin/destination effects. We present the results for probit regressions on labor force participation of women who did not reside in their birth state 5 years prior (regressions on employment and hours yield similar results). The results confirm the patterns observed in the raw data: labor force participation of married women is negatively related to migration, but destination is also important. For married women with young children, the negative effect of migration on labor force participation is substantially less for those who move back to their birth state (i.e., return migrants) than for those who move to another state (i.e., onward migrants). For married women with no children or those with only older children, the tied-mover effect is smaller and there is no discernable difference between the two migration coefficients: the effect of returning to one's birth state is the same as the effect of moving elsewhere.

Although the "tied mover" hypothesis described by Sjaastad (1962), Mincer (1978), Lichter (1983) and Greenwood (1985) does not explain our proximity results, our results imply the need to disentangle proximity effects and tied mover effects. The tied mover hypothesis postulates that the costs of migration are higher if both spouses are attached to the labor force, and concludes that single-earner couples are more likely to migrate than two-earner couples. The tied mover hypothesis implies that secondary earners (read: married women) who migrate will have less labor force attachment, at least in the short run, than secondary earners who do not migrate. Five points deserve attention. First, the tied mover hypothesis, as its name suggests, applies only to those who moved as a couple; our analysis, on the other hand, focuses on the proximity of a couple to his mother or her mother, regardless of whether they moved as a couple or as unmarried individuals.[43,44] Second, we find a positive effect of proximity only for married women with young children, while the tied mover hypothesis applies to all secondary earners who migrated as part of a couple. Third, we include controls for recent migration in all regressions. Although this does not capture long-run effects of migration, a number of studies indicate that the disruptions to wives' labor force participation are relatively short-lived (e.g., Clark and Withers (2002), LeClere and McLaughlin (1997), Marr and Millerd (1988), Spitze (1984)). Fourth, for married women with young children, we find a positive effect of close proximity to mothers-in-law even for those women who do not live in close proximity to their own mothers. Because women living near their mothers-in-law but not near their own mothers are more likely to be tied movers than those living near their own mothers but not their mothers-in-law, the tied mover hypothesis predicts a more negative effect of close proximity to mothers-in-law only. This is not what we find in NSFH or in the census. Finally, using census data, we find that for married women with young children, the effect of moving back to their birth state has a less negative effect on labor force participation than moving elsewhere.

These origin/destination results imply that the tied mover hypothesis cannot explain the proximity effects that we have found. They also imply that tied mover effects and proximity effects interact: the effect of migration on labor force attachment depends on the presence or absence of young children and on the destination of the migrant.

4. Conclusion

Using two large US data sets, the NSFH and the census, we find that living close to mothers or mothers-in-law has a strong positive effect on the labor force attachment of married women with young children. More specifically, we find that proximity increases the labor force attachment of married women with young children by 4–10 percentage points. We argue that the mechanism through which proximity affects labor supply is the availability of childcare. We interpret availability broadly enough to include not only regular, scheduled childcare but also the insurance provided by the proximity of mothers or mothers-in-law for irregular or unanticipated childcare needs.

Two endogeneity issues require attention. The first involves labor force participation and childcare, and would arise even if proximity were exogenous. Following the recent literature on childcare and labor force attachment, we address this by using an IV approach, with proximity serving as an instrument for childcare. This approach assumes that proximity is exogenous. The second issue, the potential endogeneity of proximity, is more difficult to address. We address it by analyzing a subsample of military wives – civilian women with husbands serving in the US military – arguing that, compared with the general population, their locations are more likely to be exogenous because their husbands' locations are primarily determined by military needs.

Analysis of NSFH data suggests a strong relationship between proximity to mother or mother-in-law and labor force attachment of married women with young children. Using close proximity as an instrument for childcare hours, we find that both work-related and non-work-related childcare by mothers or mothers-in-law increases the labor supply of married women with young children. We interpret the significance of non-work-related childcare as suggesting the insurance effect of proximity – the availability of family members to provide irregular or unanticipated childcare increases the labor supply of married women with young children.

We then turn to reduced form estimates of the relationship between labor supply and proximity. We do this for two reasons. First, reduced form estimates for demographic groups that do not benefit from the availability of childcare (e.g., married women without young children) provide further evidence that proximity affects labor supply through the availability of childcare. Second, the IV estimates using predicted childcare will underestimate the insurance effect of close proximity if there are women for whom childcare was available but not needed in the previous month.

We find that close proximity itself has a substantial, robust, and statistically significant effect on labor force attachment for married women with young children. We find no proximity effect for those demographic groups that would not benefit from the availability of childcare: married women whose mothers or mothers-in-law are in poor health, and women with only older children or no children. We find no proximity effect for unmarried women with young children, a non-result we attribute to the inelastic labor supply of unmarried women with children which makes them unresponsive to the availability of childcare.

Census data provide further evidence. Using living in one's birth state as a proxy for proximity to mother, we find that for married women with young children, birth state residence increases the probability of labor force participation and employment by 4.0–

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[43] The census does not provide information on whether they moved as unmarried individuals or as a couple. Many migrants are never married individuals. The 2001 Current Population Survey data show that while never married individuals comprise 28% of the population over the age of 15, 40% of inter-county migrants and 41% of inter-state migrants are never married. (Calculations by authors from the 2001 Current Population Survey data found http://www.census.gov/population/www/socdemo/migrate/cps2001.html)

[44] The migration of unmarried individuals, especially unmarried women, is driven by both marriage market and labor market considerations. For interesting discussions, see Gould and Paserman (2003), Edlund (2005) and Gautier et al. (2010).

6.1 percentage points. For married women without children and for never-married women, we find a small, negative effect of living in the birth state of one or both spouses. To control for the endogeneity of proximity, we consider the effects of proximity on labor force attachment for a sample of military wives. We find that for military wives with young children, living in the birth state of both spouses has a positive effect on labor force attachment; we find no effect of birth state residence on military wives with young children living only in his birth state or only in her birth state, and we find no effect of birth state residence on military wives without young children.

This constellation of findings cannot be explained by either the network job search hypothesis or by the tied mover hypothesis – the proximity effects are too tightly concentrated in a single demographic group – married women with young children. Because we have neither a natural experiment nor a structural model of proximity, we cannot conclusively rule out selection. The military wives sample is as close as we come to a natural experiment, but a skeptic could fairly point out that men self-select into the military and women self-select into becoming and remaining military wives. Our interstate movers sample is similarly open to the objection that individuals self-select into return migration to his or her birth state.

The effects of close proximity on the labor supply of married women with young children are substantial and robust. We find clear and convincing evidence that proximity affects the labor force attachment of married women with young children, and that the underlying mechanism is the availability of family members to meet childcare needs. These findings suggest that policies that change the ability of the older generation to provide childcare may reduce the labor force attachment of women in the younger generation.

Acknowledgments

Appendix A. Means and standard deviations, NSFH married women sample

	Live near neither mother	Live near his mother only	Live near her mother only	Live near both mothers
Currently working	0.648	0.627	0.689	0.693
	(0.478)	(0.484)	(0.463)	(0.461)
Usual weekly hours (incl. 0)	23.893	22.993	26.577	25.261
	(20.402)	(19.693)	(20.946)	(19.484)
Usual weekly hours (excl. 0)	36.906	36.690	38.642	36.166
	(12.755)	(10.783)	(13.104)	(7.746)
Coreside with her mother			0.017	0.022
			(0.130)	(0.145)
Coreside with his mother		0.041		0.029
		(0.198)		(0.168)
Different city prior wave	0.420	0.283	0.308	0.211
	(0.494)	(0.450)	(0.462)	(0.408)
Her siblings within 25 miles	0.145	0.709	0.333	0.820
	(0.352)	(0.454)	(0.471)	(0.385)
His siblings within 25 miles	0.165	0.319	0.725	0.824
	(0.371)	(0.466)	(0.447)	(0.381)
Children 12 and under	0.546	0.562	0.559	0.635
	(0.498)	(0.496)	(0.496)	(0.481)
Age	38.706	37.451	37.027	36.166
	(8.124)	(7.297)	(7.586)	(7.746)
Medical problems	0.205	0.246	0.245	0.197
	(0.404)	(0.431)	(0.430)	(0.398)
Black	0.037	0.061	0.043	0.080
	(0.188)	(0.240)	(0.203)	(0.272)
Hispanic	0.053	0.061	0.055	0.083
	(0.223)	(0.239)	(0.229)	(0.276)
Mother has college degree	0.331	0.260	0.280	0.180
	(0.471)	(0.439)	(0.449)	(0.384)
Half power – he has college	0.202	0.115	0.111	0.103
	(0.402)	(0.319)	(0.314)	(0.303)
Half power – she has college	0.081	0.080	0.089	0.071
	(0.273)	(0.271)	(0.284)	(0.257)

Means and standard deviations, NSFH married women sample (*continued*)

	Live near neither mother	Live near his mother only	Live near her mother only	Live near both mothers
Power – both have college	0.358	0.206	0.247	0.095
	(0.480)	(0.405)	(0.431)	(0.294)
Spouse's income	43,442	36,394	33,619	32,632
	(47,041)	(32,548)	(29,254)	(23,819)
He is not working	0.089	0.120	0.119	0.111
	(0.285)	(0.325)	(0.323)	(0.314)
His usual weekly hours (incl. 0)	42.522	41.571	41.148	41.706
	(16.577)	(18.765)	(18.372)	(18.214)
He has medical problems	0.246	0.262	0.217	0.289
	(0.431)	(0.440)	(0.412)	(0.453)
Midwest	0.264	0.221	0.352	0.275
	(0.441)	(0.415)	(0.478)	(0.447)
South	0.361	0.337	0.302	0.359
	(0.480)	(0.473)	(0.459)	(0.480)
West	0.249	0.249	0.197	0.145
	(0.433)	(0.433)	(0.398)	(0.352)
Average commuting time	22.101	22.266	21.928	21.780
	(4.040)	(3.812)	(4.554)	(4.100)
Resides in MSA	0.856	0.824	0.819	0.766
	(0.351)	(0.381)	(0.385)	(0.423)
MSA unemployment rate	5.970	6.353	6.145	6.637
	(1.678)	(1.742)	(1.866)	(2.248)
Her mother aged less than 60	0.291	0.305	0.344	0.377
	(0.454)	(0.460)	(0.475)	(0.485)
Her mother aged 60–69	0.332	0.345	0.354	0.342
	(0.471)	(0.475)	(0.478)	(0.474)
Her mother widowed/ divorced	0.266	0.305	0.218	0.257
	(0.442)	(0.460)	(0.413)	(0.437)
Her mother in poor health	0.142	0.132	0.122	0.134
	(0.349)	(0.338)	(0.328)	(0.340)
His mother aged less than 60	0.206	0.229	0.319	0.320
	(0.404)	(0.420)	(0.466)	(0.466)
His mother aged 60–69	0.349	0.350	0.336	0.340
	(0.477)	(0.477)	(0.472)	(0.474)
His mother widowed/ divorced	0.291	0.311	0.273	0.298
	(0.454)	(0.463)	(0.446)	(0.457)
His mother in poor health	0.102	0.168	0.093	0.120
	(0.303)	(0.373)	(0.291)	(0.325)

NSFH Wave II. Weighted percentages. Sample includes all married women aged 25–60, non-students, whose mother and mother-in-law is ALUS. "Near" is 25 miles or less.

Appendix B. Means and standard deviations, 2000 census data, married women sample

	Live in birth state of neither spouse	Live in birth state of husband only	Live in birth state of wife only	Live in birth state of both spouses
Employed	0.685	0.719	0.714	0.723
	(−0.465)	(−0.450)	(−0.452)	(−0.448)
In the labor force	0.708	0.739	0.737	0.744
	(−0.455)	(−0.439)	(−0.440)	(−0.436)
Age	36.636	36.254	36.103	36.177
	(−5.590)	(−5.662)	(−5.717)	(−5.705)

Appendix B (*continued*)

	Live in birth state of neither spouse	Live in birth state of husband only	Live in birth state of wife only	Live in birth state of both spouses
Less than high school	0.064 (−0.245)	0.076 (−0.266)	0.086 (−0.281)	0.092 (−0.289)
More than high school	0.335 (−0.472)	0.353 (−0.478)	0.346 (−0.476)	0.337 (−0.473)
Bachelors	0.259 (−0.438)	0.219 (−0.414)	0.205 (−0.403)	0.160 (−0.367)
More than bachelor	0.117 (−0.321)	0.080 (−0.271)	0.080 (−0.271)	0.055 (−0.229)
Spouse less than high school	0.080 (−0.272)	0.097 (−0.296)	0.119 (−0.324)	0.119 (−0.324)
Spouse more than high school	0.299 (−0.458)	0.319 (−0.466)	0.318 (−0.466)	0.305 (−0.460)
Spouse bachelors	0.247 (−0.431)	0.197 (−0.398)	0.194 (−0.395)	0.148 (−0.356)
Spouse more than bachelors	0.165 (−0.371)	0.089 (−0.285)	0.101 (−0.301)	0.055 (−0.228)
Spouse work disability	0.084 (−0.277)	0.097 (−0.296)	0.096 (−0.294)	0.102 (−0.302)
Work disability	0.068 (−0.253)	0.078 (−0.268)	0.075 (−0.264)	0.078 (−0.269)
Black	0.060 (−0.237)	0.053 (−0.224)	0.063 (−0.243)	0.071 (−0.257)
Hispanic	0.043 (−0.203)	0.033 (−0.179)	0.081 (−0.273)	0.047 (−0.212)
Renter (free rent)	0.023 (−0.150)	0.017 (−0.129)	0.015 (−0.121)	0.016 (−0.127)
Renter	0.198 (−0.398)	0.164 (−0.370)	0.185 (−0.389)	0.147 (−0.354)
Metropolitan area	0.745 (−0.436)	0.639 (−0.480)	0.697 (−0.460)	0.616 (−0.486)
Spouse's total income	60,539 (−65,287)	50,786 (−54,755)	51,392 (−55,358)	45,894 (−46,326)
Migrant	0.292 (−0.455)	0.095 (−0.293)	0.069 (−0.254)	0.023 (−0.149)
Children less than 12	0.641 (−0.480)	0.640 (−0.480)	0.649 (−0.477)	0.644 (−0.479)
Children over 12	0.142 (−0.349)	0.158 (−0.365)	0.151 (−0.358)	0.178 (−0.383)
No children	0.218 (−0.413)	0.202 (−0.401)	0.200 (−0.400)	0.178 (−0.382)
Mid-Atlantic region	0.071 (−0.256)	0.109 (−0.312)	0.116 (−0.320)	0.180 (−0.384)
East north central region	0.292 (−0.455)	0.181 (−0.385)	0.173 (−0.378)	0.128 (−0.334)
West north central region	0.061 (−0.240)	0.079 (−0.270)	0.068 (−0.251)	0.074 (−0.263)
South Atlantic region	0.101 (−0.302)	0.126 (−0.332)	0.129 (−0.335)	0.116 (−0.320)
East south central region	0.094 (−0.291)	0.168 (−0.374)	0.163 (−0.369)	0.236 (−0.425)
West south central region	0.060 (−0.238)	0.094 (−0.292)	0.077 (−0.266)	0.092 (−0.289)

Appendix B (*continued*)

	Live in birth state of neither spouse	Live in birth state of husband only	Live in birth state of wife only	Live in birth state of both spouses
Mountain	0.135	0.070	0.065	0.032
	(−0.342)	(−0.255)	(−0.247)	(−0.176)
Pacific	0.131	0.121	0.160	0.092
	(−0.338)	(−0.327)	(−0.367)	(−0.289)

U.S. Census 2000. Sample includes all married women aged 25–45, non-students.

Appendix C. Means and standard deviations, 2000 census data, military wives sample

	Live in birth state of neither spouse	Live in birth state of husband only	Live in birth state of wife only	Live in birth state of both spouses
Employed	0.556	0.613	0.621	0.643
	(−0.497)	(−0.487)	(−0.485)	(−0.479)
In the labor force	0.603	0.653	0.663	0.675
	(−0.489)	(−0.476)	(−0.473)	(−0.469)
Age	31.398	32.316	31.046	31.873
	(−6.710)	(−6.703)	(−6.848)	(−6.940)
Less than high school	0.046	0.035	0.042	0.062
	(−0.209)	(−0.184)	(−0.200)	(−0.241)
More than high school	0.426	0.473	0.481	0.408
	(−0.494)	(−0.500)	(−0.500)	(−0.492)
Bachelors	0.202	0.191	0.167	0.147
	(−0.401)	(−0.393)	(−0.373)	(−0.354)
More than bachelor	0.057	0.061	0.040	0.049
	(−0.231)	(−0.240)	(−0.196)	(−0.215)
Spouse less than high school	0.010	0.013	0.008	0.022
	(−0.097)	(−0.113)	(−0.088)	(−0.147)
Spouse more than high school	0.471	0.482	0.516	0.505
	(−0.499)	(−0.500)	(−0.500)	(−0.500)
Spouse bachelors	0.165	0.179	0.139	0.138
	(−0.371)	(−0.384)	(−0.346)	(−0.345)
Spouse more than bachelors	0.134	0.105	0.081	0.055
	(−0.341)	(−0.307)	(−0.272)	(−0.228)
Spouse work disability	0.060	0.045	0.062	0.091
	(−0.237)	(−0.208)	(−0.242)	(−0.288)
Work disability	0.047	0.065	0.053	0.062
	(−0.211)	(−0.247)	(−0.224)	(−0.242)
Black	0.125	0.118	0.116	0.129
	(−0.330)	(−0.323)	(−0.320)	(−0.336)
Hispanic	0.063	0.062	0.092	0.111
	(−0.243)	(−0.242)	(−0.290)	(−0.314)
Renter (free rent)	0.299	0.178	0.188	0.133
	(−0.458)	(−0.383)	(−0.391)	(−0.340)
Renter	0.364	0.294	0.348	0.272
	(−0.481)	(−0.456)	(−0.476)	(−0.445)
Metropolitan area	0.771	0.778	0.772	0.673
	(−0.420)	(−0.416)	(−0.420)	(−0.469)
Spouse's total income	36,979	37,746	35,162	34,950
	(−23,823)	(−18,813)	(−20,921)	(−19,832)
Migrant	0.756	0.521	0.312	0.230
	(−0.430)	(−0.500)	(−0.464)	(−0.421)

Appendix C (*continued*)

	Live in birth state of neither spouse	Live in birth state of husband only	Live in birth state of wife only	Live in birth state of both spouses
Children less than 12	0.716	0.697	0.709	0.700
	(−0.451)	(−0.460)	(−0.454)	(−0.458)
Children over 12	0.074	0.083	0.068	0.096
	(−0.261)	(−0.276)	(−0.252)	(−0.294)
No children	0.210	0.219	0.223	0.204
	(−0.407)	(−0.414)	(−0.416)	(−0.403)
Mid-Atlantic region	0.035	0.071	0.045	0.092
	(−0.184)	(−0.258)	(−0.208)	(−0.289)
East north central region	0.414	0.323	0.291	0.219
	(−0.493)	(−0.468)	(−0.454)	(−0.414)
West north central region	0.074	0.058	0.048	0.083
	(−0.262)	(−0.235)	(−0.215)	(−0.276)
South Atlantic region	0.108	0.144	0.163	0.134
	(−0.310)	(−0.351)	(−0.370)	(−0.341)
East south central region	0.026	0.065	0.048	0.112
	(−0.158)	(−0.247)	(−0.213)	(−0.315)
West south central region	0.045	0.036	0.043	0.079
	(−0.208)	(−0.187)	(−0.202)	(−0.270)
Mountain	0.087	0.056	0.063	0.041
	(−0.282)	(−0.230)	(−0.243)	(−0.199)
Pacific	0.189	0.208	0.270	0.203
	(−0.392)	(−0.406)	(−0.444)	(−0.402)

U.S. Census 2000. Sample includes all civilian women married to active federal military employees, aged 18–45, non-students.

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