Where to Live? The Locational Decisions of Young Adults and Later Parental Care

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Abstract

The majority of care for the elderly is provided informally by family members. For elderly women, adult children are the most likely providers of this care. And among children, it is typically the child who lives closest to the parent who provides the majority of care. However, living arrangements are likely determined in part by the need (or anticipated need) of providing care. In this paper we propose an instrumental variables approach for estimating the effect of distance on caregiving. We find that distance is still an important determinant of care, but that is effect is approximately 20 percent smaller. We also find important differences in the importance of schooling when an exogenous measure of distance is included in a regression of the determinants of care.

Numerous studies have shown that geographic proximity is a key correlate in the provision of care to elderly parents (Borsch-Supan, Kotlikoff, and Morris, 1988; Crimmins and Ingegneri, 1990 among many others). However, it is clear that living arrangements are not determined independently of the care giving decision; children who need or wish to provide care for an elderly parent may locate in close proximity to the parent for that very purpose. Although research has shown in increase in the likelihood of moving closer together when a parent faces increased functional limitations (Silverstein, 1995; Rogerson, Burr and Lin, 1997), the majority of families do not become more geographically proximate over time.[1] This lack of change in residential location may stem from the fact that over one-half of older adults have at least one child living within 10 miles of them so caregivers are already available (Zhang, Engleman, and Agee, 2012) and no moves are necessary.

An alternative to examining living arrangements coincident with care, is to examine distance prior to the need for assistance. It is difficult to know how far back to go in that one can readily argue that decisions about location are made in anticipation of future needs and causality could run in reverse. Konrad et al., (2002) and Rainer and Siedler (2009) model the decision of how far to move from parents early in life as a game between siblings in which children want their parents to receive care but would prefer to have their siblings bear the cost. They show that children with siblings live farther from parents than only children and that this effect remains strong even as parents age. The presence of siblings is then correlated with distance from parents.

We re-examine the decision of where children locate relative to their parental home and how that distance is correlated with the subsequent provision of care. Rather than exploit birth

[1] Data from the 1988 and 1992 National Survey of Families and Households show that over 80 percent of older parents either remain the same distance from children or move farther apart over the four year period (Silverstein, 1995; Rogerson, Burr and Lin 1997).

order or the presence of siblings as past work has done, we propose an instrumental variables approach in which our instrumental variable is correlated with where a child locates relative to his parent but uncorrelated with the potential need to provide care in the future. We use as our instrumental variable the tuition at the state university in the state in which the child lived when he turned 18. This variable will affect whether the child attend a university at all and when measured relative to non-resident tuition in other states, whether he attends college someplace further from his home. However, it is uncorrelated with eventual parental needs or with the child's perception that he will need to provide for a parent.

Our identification strategy begins with the observation that the distance between parents and children is strongly related to educational attainment (Loken, Lommerud, and Lundberg, 2012; Compton and Pollak, 2009). Compton and Pollak (2009) show that college educated children are half as likely to live within 30 miles of a parent than children without a college degree. Children with a college degree live farther from parents for a variety of marriage and labor market reasons but we argue that one factor that causes them to live farther away is that they leave home to go to college.[2] Bound et al. (2003) and Groen (2004) have shown a modest correlation between the state in which the child attends college and whether the child chooses to work in that state after college. Furthermore, states have attempted to exploit this correlation to keep their talented young people from leaving by reducing the price of in-state colleges either through quality public universities or by offering special scholarships for high achieving high school students should they attend an in-state college. Cornwall et. al. (2006) and Dynarski (2000) showed that the HOPE scholarship program in Georgia was successful in both increasing college enrollments for high school students in Georgia and in promoting attendance at in-state

[2] Single people with a college degree are also more likely to migrate to cities than their counterparts without a college degree (Compton and Pollak, 2007) suggesting that marital decision making is not the sole cause of this movement. However, Loken, Lummerud, and Lundberg (2012) show that martial decision making is especially important in explaining why less educated married men in Norway live nearer to their own parents than to their wife's parents.

colleges. Similarly, New York State has long offered scholarships to its top high school students who attend a New York State post-secondary institution.

We use this relationship between college and location to posit a first-stage regression wherein the distance between parents and children is a function of the in-state tuition for the state in which the child lived when he was 18 and the ratio of in-state tuition to the average out-of-state tuition for the remaining states. We then use this predicted geographic distance as a right hand side variable in an equation for whether the child anticipates provides care to a parent when the parent is old.

Our first stage results show that individuals who live in states with higher tuition and higher relative tuition are more likely to move farther away when they establish their own household than are students in states with relatively low in-state tuition costs. We also show that distance from parents is a key correlate in whether middle age adults anticipate caring for parents. We find somewhat weak evidence that much of the correlation between distance and the anticipation of caregiving is driven by exogenous differences in location choices but that approximately 20 percent of the correlation is endogenously determined.

The outline of our paper is as follows: section one describes the data and the patterns of distance over the life-course, section two describes the relationship between tuition and initial location decisions, section three examines the relationship between anticipating giving care to a parent and distance using college tuition as an instrumental variable for distance, section four concludes and provides directions for future analysis.

Distance in the PSID

Our sample consists of mother-child pairs in the Panel Study of Income Dynamics (PSID).[3] The PSID is a household based panel survey first fielded in 1968 at which time it was selected to be representative of the population of households in the United States. The survey interviewed its respondents annually until 1997 and then switched to biennial interviews. The PSID is unusual among panel surveys in that it does not limit its coverage to the set of original respondents, but rather adds children and spouses of these respondents to its sample when they are born to or marry a PSID respondent. The survey then follows not only the original adult respondents but also the biological and adopted offspring of these respondents, even when they leave their parents' households. The PSID also differs from other surveys in the length of time individuals are followed, now over 40 years for some, and in the detailed information it collects on family members. In the PSID we can thus observe characteristics of children and their mothers when the children leave home for the first time as young adults and observe them later in life as their situations change. In our analysis we include both the 1968 population representative sample (SRC sample) and the oversample of minorities and poor families (SEO sample).

We limit our sample to children who are observed living with their parents at some point in the survey but who are later observed to leave the parental home. Children who satisfy these criteria become sample persons themselves in the language of the PSID, complete their own interviews, and are followed over time.[4] We also require that the children in our sample are observed at age 18 and that they remain in the sample until at least the age of 25. We make these limitations for several reasons. We require children to be in the sample at age 18 because this is the time at which decisions on college attendance are likely to be made and we want to know the state in which they are living at that time. We also require children to remain in the sample until

[3] We use mother-child pairs rather than father-child pairs because mothers are far more likely to receive care from children at an older age and because children in divorced families are more likely to be residing with their mother than with their father.

[4] In future work we will examine those children who remain at home throughout the survey. While a small sample, these children are potentially important caregivers for aging parents.

age 25 because at this age schooling is likely completed so even those children who attended college would likely have formed their own households. We use all waves of the PSID data and thus can observe children living independently as soon as 1970 (having lived at home with their mother in 1968) and up until 2009.[5] These restrictions provide us with a sample of 5184 mother-child pairs.

The PSID also allows us to construct extremely accurate measures of the distance between parents and children. Many surveys limit geographic measures to dichotomous variables for whether a child lives within 10 or 100 miles of a parent. In using the PSID we draw on restricted data that provides information on the Census Block of each respondent at each interview and thus compute the distance between mother and child using the coordinates of the centroid of the Census Block. This measure provides for far more nuanced measures of differences in distances over time and differences across siblings than have been possible in the past. Because of the way in which we calculate distance, children and mothers who live in the same Census Block live zero miles from each other. We are able to differentiate zero distance in the form of co-residence with zero distance but living in separate residences.

Although we begin with an analysis of the location of children when they first leave home, we are also interested in where they live later in life and in particular, when their mother might begin to need care. For these analyses we examine the subsamples of children who are observed at 35 and those who are observed again at 45 when their mothers are approximately ages 60 and 70 respectively, and when the need for care may be reasonably anticipated. We are restricted from examining patterns at older ages because of our requirement that we observe children as young as age 18—too few mother child pairs are observed both at this age and when the mother is in her 80s. The PSID also has limited information on the need for and provision of

[5] The PSID geographic information is missing for 1969 so while the sample begins in 1968, the first year of our analysis is 1970.

home health care so we focus our analysis on location for the bulk of the paper. However, for a sample of individuals who were interviewed in the PSID in 2007, we have a measure of anticipated future caregiving for parents. We use these data to examine the relationship between distance and the anticipation of providing care.

Sample: Table 1 shows the means of selected variables of interest for the 5184 children in our sample. The variables here are measured in the year in which children "split-off" from the parental home, defined as when they leave home for the first time. Young adults who go to college, to the military, or to prison directly from the parental home are not considered to have split-off from their parents' households until after they have left these institutions and established their own homes. We note that there are important differences across demographic groups in the age at which this event occurs but regardless of age, we select this transition as the starting point for our analyses.[6]

The average age at which children become independent (by our definition) is 22, consistent with many children starting out on the own after completing a college education. Despite this empirical regularity, only 27 percent of the sample is a college graduate with 41 percent having a high school education or below. Because our sample spans a long period of years it is difficult to find comparable statistics. In the 1987 Current Population Survey (the mean year of these first observations for our sample), approximately 54.8 percent of 25-34 year olds have a high school diploma or less while 23.9 percent have a college degree or more so our sample is more educated than the population in the average year. In the 2011 CPS, approximately 38 percent of 25-34 year olds have a high school diploma or less while 32 percent have a college degree or more (CPS, 2011). Because the distribution of our sample is somewhere

[6] If we examine all children at age 25 regardless of whether they are ever observed to leave the parental home. The means are nearly identical to those of the sample who we observe leaving the parental home.

between that of the 1987 CPS and the 2011 CPS, we presume that the differences are due to the distribution of our sample across years. [7]

The sample is 88 percent white and 12 percent non-white. Because of the PSID sampling frame, which oversampled poor rural families in the South and poor urban families in the North, most of our non-white sample is black. We also have a very small number of Asians and Hispanics consistent with the US population in 1968 when the PSID was launched.[8]

The children in our sample have an average family income of $38,000 when they are first observed in their own households and come from parental households with an average income of $94,000.[9] The children in the sample have significantly more schooling than their parents. For mothers, 53 percent have a high school degree or less and 47 percent have at least some college. While 55 percent of fathers have a high school degree or less and 44 percent have at least some college. Thirty percent of the children in our sample are first born (with at least one sibling), 5 percent are only children, and 32 percent are the youngest child (with at least one sibling). The remaining 33 percent are middle children with siblings.

Our variable of interest, the average distance between children and their mothers at this point in time is 167 miles but the median is just 3.67 miles. The difference between the median and the mean reflects the long tail of the distribution of distance as well as how surprising close families tend to live to each other. For comparison with other data sources wherein a metric of within 10 miles is often used, we find that 58 percent of children live within 10 miles of their mother when they first leave their mother's home.

[7] If we restrict our sample to young adults who have split off since 1995, we have 33 percent with a high school diploma or less and 30 percent with a college degree or more—closer to the 2011 CPS.
[8] The PSID currently under represents Hispanics, Asians, and immigrants arriving after 1968. Thus, although past analyses suggest significantly different patterns of living arrangements and care giving for elderly Hispanics, we are unable to address this issue.
[9] We exclude children who do not co-reside with their mother (i.e. those who live with grandparents or other relatives only) before they leave home but include children living with either a biological or adopted mother. Our sample includes single mother households but not single father households.

Initial Location: In the subsequent columns in the table we divide our sample into groups based on the distance between mother and child at this point in time in order to examine how demographic characteristics vary with the choice of location. We group the sample into children who remain within 10 miles when they leave their mother's home, those who move to between 11 and 50 miles away, those who move between 51 and 100 miles away, and those who move more than 100 miles away. We test differences in means between children who remain within 10 miles and each of the three farther distance groups. For comparison we also include a column for those children who are still living at home at age 25.

The numbers in the table highlight the familiar relationship between distance and the educational attainment of the child. In particular, while more than one-half of children who are first observed to live within 10 miles of their mother's home have 12 or fewer years of education, this figure falls to 29 percent for those living over 100 miles away and 70 percent of children farther afield children have at least some college education. The differences in educational attainment between those who remain within 10 miles and those who move farther are nearly statistically significant for all categories.

The differences in parental education by distance category echo the differences in the educational level of children. Children who move farther away have more educated parents; they are 10 to 15 percentage points more likely to have mothers and fathers who are college graduates than are children who live within 10 miles of home.

Table 1 also shows small differences in the gender composition of the samples. Consistent with prior work, daughters are more likely than sons to move between 10 and 100 miles away from the parent while sons are more likely to move more than 100 miles away. These differences are statistically significant at the ten percent level. Perhaps surprisingly, the age at

which the child leaves home does not differ significantly by distance category, but parental family income and race are both strongly correlated with this distance. White children and children in higher income families are more likely to live a great distance from their mothers, perhaps due to their greatly likelihood of going to college and leaving the state for a private or out-of-state school. For both race and income (and to a certain extent, educational attainment), the largest differences in characteristics seems to be in between children who remain very close to their mother (<10 miles) and children who move farther with relatively small differences across the various distance categories. With educational attainment of the child, there are also relatively large differences between children who move over 50 miles from their mother and those who move 11-50 miles away. Children who move away from home but remain geographically close to their mother are more likely to be black, are more likely to come from lower income families, have more siblings, and have less well educated parents. Somewhat surprisingly, the family income of the child himself does not vary with distance. Despite earlier results (Konrad et. al, 2002) that oldest children make strategic moves to distance themselves from the family home, the children in our sample who live in the furthest distance category do not appear more likely to be the oldest than the youngest.

Although they are excluded from the remainder of the analysis, the characteristics of the 481 children who reach the age of 25 but are not observed to leave home suggest that they are in the lowest socio-economic grouping. They are the least educated of the various categories and they are more likely to be non-white than young adults who we observe leaving home. They are also from poorer families with less well-educated parents. They are also more likely to be male and to be the youngest child in the family.

Table 1 showed that remaining closer to the family home when starting out on one's own is strongly related to education, race, income, and a number of other variables, many of which

are correlated with each other. In table 2 we therefore examine the locational decision in a multivariate regression context controlling for characteristics of both the mother and the child. The first column shows the results from estimating Equation (1), a tobit model where y is distance in miles from mother and is censored and clustered at 0.

$$dist^* = \beta_0 + x\beta + u$$

$$dist = \max(0, dist^*) \quad (1)$$

The second and third columns shows the results of estimating equation (2), a simple linear probability model of whether the child lives more than 100 miles away when first observed to live independently (column 2).

$$Greater\ than\ 100\ miles\ (0/1) = \alpha_0 + x\alpha + e \quad (2)$$

Both sets of results show a strong positive relationship between distance and both years of schooling and race even after controlling for parental income, gender, and birth order. Column 1 shows that an increase in schooling of one year increases initial distance by 25 miles. Column 2 shows that an increase in schooling of one year increases the probability of living far away from the mother by 1.6 percentage points on a base probability of 16.79 percent, an increase of approximately 10 percent. The other covariates generally move in the expected direction, males are more likely to move far from away from their mothers when they leave home than females while non-whites are less likely to live farther away. Parental income does not have strong predictive power with respect to distance but there is some evidence of a birth order effects. In particular, the youngest child is more likely to move farther away than his older sibling(s). This result is the opposite of the findings of Konrad et. al (2002) who find that only children and younger children are more likely to live near parents in Germany. However, because we are not restricting our sample to one and two child families (as in Konrad et. al, 2002) we hesitate to place too much weight on the birth order effects that we estimate.

Changes over time: We are interested in the child's initial locational decision because we expect that it will affect later care to the parent. It is thus sensible to ask how stable is the child's location? Does a child who initially lives far from his mother remain so? In table 3a we provide a 4x4 cross tab of the location of the child initially and at age 35. By this later age we anticipate that he will be settled in his career and family and significant changes in location are unlikely.[10] In extending our observation period to age 35, approximately 12 years beyond the average age at the initial move, we lose observations for children in the youngest cohorts who have not reached age 35 by 2009 and those who attrit from the survey before this time. This restriction leaves us with 2,794 mother-child pairs. The table shows that, as expected, location is relatively stable over time and moves are not overwhelmingly in one direction of the other. Nearly sixty percent of individuals live in the same distance category at age 35 as they do when they first strike out on their own. Approximately 25 percent of children live farther from their mother at age 35 and only 18 percent live closer. Table 3b shows the same relationship at age 45. Again, the sample size is reduced to 1,026 mother-child pairs due to attrition and the age of the sample. However, the relationship between distance at 45 and initial distance is similar to that at age 35. Over half of the sample remains in the same distance category with slightly under 30 percent moving farther away and under 20 percent moving closer to their mother.[11] At age 35, the average age of the mother is 61 while at age 45 her average age is 71 years old. Because of the similarity in the relationship between distance at split-off and distance at 35 and the same relationship at age 45, in what follows, we use the sample of individuals who remain in the sample at age 35 to

[10] When we examine distance between parents and children in the PSID across child age, distance between parents and children stabilizes in the child's mid-30s this is consistent with the mobility schedule shown in Lin and Rogerson (1995). See the chart in the appendix.

[11] When we examine the same table using the distance at age 25 instead of the distance at the time of leaving home, the distribution in table 3a and 3b is nearly identical. There is a small sample of individuals who leave home after the age of 25.

maximize sample size.

Because there may be a correlation in the age at which a child leaves home and his level of education (although table 1 did not indicate a difference) we also constructed these 4x4 matrices using distance at age 25 rather than when first observed to leave home. The results are unchanged.

Table 4 examines the relationship between distance later in life and initial distance in a regression context. We estimate equation (1) and (2) using distance at age 35 as the left hand side variable because we have more observations than at age 45. We use both the actual distance at age 35 and a binary variable for greater or less than 100 miles as left hand side variables and include age at initial observation as a right hand side variable. Also included as right hand side variables are other characteristics of children: gender, schooling, marital status, siblings and their relative age, race, and the income of the mother's household. Both initial distance and schooling are strong predictors of location at age 35.[12] Moving more than 100 miles away initially is associated with a 310 mile increase in the distance from one's mother at age 35 and a 40 percentage point increase in the probability of living more than 100 miles away at age 35—tripling the probability of living far away. However, even when controlling for initial location, schooling continues to have significant predictive power. A one-year increase in years of schooling increases distance by 25 miles and increases the probability of moving far away by 1.2 percentage points. There also continue to be large effects of race and marital status with non-whites living closer than whites and married children living farther away than single children. The effects of gender are no longer significant.

Tuition and Distance at Split-off

[12] In results not shown, distance at age 25 is also a strong predictor of distance at age 35.

The regression results show a strong and persistent relationship between educational attainment and distance from mother from early adulthood until middle age with children who have attended college living further from home. This pattern can occur because 1) highly education children have more fewer opportunities (or less desirable opportunities) in their home town and relocate in a city or specific area of the country, 2) because they are exposed to different areas of the country and find a location with more amenable characteristics, or 3) they make friends or find spouses while away at school and choose their location in consult with others.

Given this evidence, we next move to understand the decision of which college to attend. Obviously there are an array of factors that affect the decision of a child of first whether to go to college, and second, which college to attend, and we are unable to control for the vast majority of these. However, because we are primarily interested in whether the child attends a college far from home, we focus on the cost of attending a state university. Our hypothesis is that the absolute cost of attending the local college affects enrollment and the relative cost of tuition in one's home state relative to out-of-state tuition elsewhere is correlated with whether the child leaves the state to pursue his education. Young adults who live in states with in-state tuition that is high relative to the cost of out-of-state tuition in other states will be more likely to go to college further from home than those who live in states with relatively cheap tuition. This type of mechanism would be consistent with the effects of the HOPE scholarship in Georgia (Dynarski, 2000; Cornwall et. al., 2006). We begin by testing this hypothesis, examining whether the relative cost of college is correlated with moving farther away at the time of split-off.[13]

To proxy the cost of attending college, we collected the average in-state and out-of-state tuition information for public 4-year institutions in each state in each year from 1969 to 2009. We merge these data to our data on the sample of PSID adult children. To examine the relative

[13] We are currently working on examining whether the level of tuition is correlated with educational attainment.

cost of college, we compare the average cost of in-state tuition to to the average of the out-of-state tuition for all other states. Specifically, we create a ratio of the cost of in-state tuition in the state of residence to the average cost of out-of-state tuition in the rest of the country for individual *i* in state *s* in the year *t* in which they turn 18. In our sample, individuals turn 18 in different states and in different years, which provides variation in the relative cost of college for our sample. The relative price of education in the home state could affect whether a college attending child stays in state or moves farther away and will therefore have an effect on the initial location and later in life.

To examine the relationship between relative tuition costs and distance from parents, we estimate equations (1) and (2) but include relative tuition. We continue to control for years of schooling to isolate the effect of tuition differences on distance independent of its effect on years of schooling. This procedure allows us to examine how and whether the distance that a child first moves from his mother is related to the relative costs of tuition in the state of residence. In order to control for observable and unobservable differences in tuition costs, returns to education, and the value placed on a college degree over time and across states we control for state and time fixed effects. We also include the explanatory variables that we included in tables 2 and 4. Table 5 shows the results of estimating equations (1) and (2) where we include relative tuition costs and tuition levels. All standard errors are clustered at state/year level. The coefficients in table 5 show that higher relative costs of schooling are associated with living at a greater distance (significant at 13 percent level) and with a higher probability of living far away. A one standard deviation increase in the relative cost of tuition increases distance by 23 miles and increases the probability of living far from home by 2.6 percentage points. We have controlled for the years of education so the effects of tuition on distance are independent of the effects of the level of schooling. The remainder of the coefficients move in the expected direction with married people

and non-whites being more likely to live closer to parents.

While we hypothesize that the relative cost of schooling affects initial distance by making it more likely that young adults attend college out-of-state (and thus typically further away), we do not have any direct evidence that this is the channel through which tuition ratios operate. Fortunately, the PSID allows us to examine this channel directly because the survey collects information on the college that PSID heads and wives attend. In future work, we will use these data to examine whether students from relatively high price states are more likely to attend college out-of-state and whether they are more likely to attend private colleges. We will also be able to examine directly the distance between the child's college and his home.

Caregiving Later in Life

Ultimately we are interested in the effect of distance on providing care for an elderly parent. We have shown that initial distance is related to distance later in life and that this initial distance is in part a function of the relative cost of schooling at the time educational decisions are made. With this framework, we would like to estimate the relationship between providing care to an aging parent and distance, with tuition costs serving as an instrumental variable for the distance between the parent and child.

The PSID is an ideal dataset for showing how distance evolves over the life-cycle, however, it is less than ideal for studying caregiving. With the exception of one module in 1988, individuals in the PSID are not asked whether they provide care to an aging parent. Because our sample includes only those children who were in the PSID at age 18, the earliest birth year in our sample is 1950. By 1988, even the oldest individuals in our sample are only 38 and only approximately 300 individuals are over the age of 35. The average age of the children in our sample in 1988 is 25 and the average age of their mother is 55. Because of this restriction the

supplemental information on caregiving in 1988 is not useful. Instead, we use a measure of anticipated caregiving that was asked in 2007. In a special supplement to the 2007 data, individuals were asked whether they anticipate caring for an aging parent. These data are not perfect because they do not distinguish between caring for parents and caring for parents-in-law. In our sample, all individuals have a living parent who is a current PSID sample member and we measure "caregiving" for this parent using the response to the anticipated caregiving question. Our sample size declines to 1,398 individuals because we must restrict the sample to individuals who are 35 years old and over *and* who are PSID surveyed in 2007. Nearly 60 percent of the individuals in our sample anticipate providing care to an aging parent. To provide some comparison, individuals were also asked whether they had ever provided significant care to a parent in the past and approximately 28 percent of them responded that they had provided such care.

We first estimate the probability that an individual anticipates providing care to an aging parent first as a function of all of the covariates in table 2. This set of regressors includes years of schooling, marital status, birth order, and race. Notably, in line with most studies of this sort, we exclude distance. We then estimate the probability that an individual anticipates providing care to a parent as a function of current distance, measured using a binary variable equal to one if the individual lives more than 100 miles away, along with the covariates included in Table 2. This regression, reported in table 6, shows the results that most researchers would term as "wrong" given the expected endogenity of distance. Column 1 shows the relationship between anticipated caregiving and individual characteristics excluding current distance. Column 2 shows the relationship between anticipating giving care to a parent and individual characteristics including current distance. Finally, column 3 shows the results of our model in which we use the ratio of in-state and out-of-state tuition at age 18 as an instrumental variable for current distance.

When we do not control for distance, schooling has a negative effect on anticipated care. One additional year of schooling decreases the probability that an individual anticipates providing care by 1.4 percentage points. However, when we control for distance (column 2), the effect of schooling becomes small and insignificantly different from zero, while distance is a strong predictor of anticipated care. Specifically, children who live more than 100 miles away from a parent are 20 percentage points or 30 percent less likely to anticipate providing care than are those who live closer. We hesitate to compare the effect of distance and education on the anticipation of care with estimates from past studies of actual care. However, the relationship between distance and expected care is not surprising. Other covariates also operate in the expected direction. There are no birth order effects but sons are less likely to anticipate giving care than are daughters (Note that we do not have information on whether the daughters-in-law might provide care). Non-whites and unmarried children are more likely to anticipate providing care to a parent than whites or married children.

Finally, column 3 shows the results of estimating the effect of current distance on whether an individual anticipates providing care to a parent using the relative tuition cost as an instrument for whether the individual lives greater than 100 miles from a parent. We find that the coefficient on current distance drops by 3.2 percentage points (or 16 percent) and that it is not significant at conventional levels given the large standard errors. The drop in magnitude suggests that much of the correlation between distance and caregiving is endogenous—that is that individuals who anticipate caregiving are more likely to live closer to parents—however, the majority of the effect of distance on caregiving appears to be related to exogenous factors that influence initial location decisions. However, because the effect is imprecisely estimated, we

hesitate to make stronger claims about the relationship between caregiving and distance.[14] We also caution once again that there is a difference between the reported probability of providing care and the actual provision of such care later in life.

Conclusion and Directions for Future Analysis

This paper uses the extensive information on geographic location in the PSID to examine distance between mothers and children over the life-cycle. It exploits the fact that the PSID follows both mothers and children as the child grows up, as the child leaves home, and as the mother ages. We show that distance between mothers and their children at the time of split-off is strongly related to educational attainment of children. We further show that the relative cost of tuition at age 18, when children likely decide whether and where to go to college, is related to the distance that children move when they split-off from the parental home—on average at the age of 22. Finally, we exploit this relationship between tuition costs and distance between mothers and children to explore the relationship between anticipating caregiving and distance using a source of exogenous variation in distance between parents and children. Our results suggest that the negative correlation between living far away from a mother and anticipating providing care is driven largely by exogenous location decisions early in life but that at least part of the correlation is due to endogenous location choice.

These results are preliminary and there are three extensions to the analysis on which we are currently working. The first is to address the problem that the small sample size on which we are able to estimate any relationship between caregiving and distance seems to weaken the first-stage correlation between distance and tuition variables. We are collecting data on local labor

[14] One of the problems is that when we restrict the sample to individuals who are in the PSID sample in 2007 the first-stage relationship between living more than 100 miles away and tuition ratios at 18 is weaker (the coefficient on the tuition ratio is 0.09 with a standard error of 0.063. The coefficient size is similar to that in Table 5 but the standard error is larger. We are currently experimenting with other instruments including those related to private college costs and instruments that describe local labor markets at age 18.

market conditions in the county of residence when the child turns 18 and on the cost of private tuition as additional instruments for distance between parents and children. We hope that the additional instruments will strengthen our first-stage results and allow us to interpret our findings will less caution. Second, we are working with new data available from the PSID on the actual college that PSID sample members attend. While we hypothesize that young adults from states with more expensive in-state tuition may be more likely to attend college, we are unable to show this directly in our current analysis. Using data on the college that students actually attend, we will be in the position to explore the decision about where to attend college explicitly. Third, while the PSID is ideal for studying how location evolves over the life-cycle, it is not as good for examining provision of care to an aging parent. Our measure of caregiving only captures whether individuals anticipate providing care and does not distinguish between providing care to a parent and providing care to a parent-in-law. In 2013, the PSID will collect data on time transfers, which should allow a more detailed exploration of care provision. And finally, we are exploring using the Health and Retirement Study [HRS] to look at the relationship between caregiving and distance. While it is impossible to know the evolution of distance between parents and children from the time that children leave home using the HRS, the HRS does have much more extensive data on providing care. In addition, respondents were asked about the college that their children attended which may allow us to use the relationship between college location as a source of exogenous variation in distance later in life.

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Tables and Figures

Table 1. Means of Selected Variables by Distance at the Time of Leaving Home

	All	<10 Miles	11-50 Miles	51-100 Miles	Over 100 Miles	Children who do not split-off (age 25)
Fraction in Category	1.00	0.58	0.17	0.05	0.20	
Age	22.22	22.23	22.53	21.91	22.12	25.00
	(0.06)	(0.08)	(0.15)	(0.21)	(0.13)	
Education of Child						
< HS	0.07	0.09	0.05	0.05	0.04	0.09
	(0.004)	(0.01)	(0.01)*	(0.02)	(0.01)*	(0.02)
HS Grad	0.34	0.41	0.27	0.18	0.25	0.42
	(0.01)	(0.01)	(0.02)*	(0.03)*	(0.02)*	(0.03)
Some College	0.31	0.32	0.29	0.29	0.29	0.31
	(0.01)	(0.01)	(0.02)*	(0.04)*	(0.02)*	(0.03)
College Grad	0.27	0.18	0.38	0.47	0.41	0.19
	(0.01)	(0.01)	(0.02)*	(0.04)*	(0.02)*	(0.03)
Child Schooling	13.65	13.22	14.13	14.51	14.31	13.15
	(0.03)	(0.04)	(0.09)*	(0.16)*	(0.08)*	(0.14)
Number of Siblings	3.93	4.11	3.66	3.69	3.69	3.94
	(0.04)	(0.05)	(0.08)*	(0.15)*	(0.08)*	(0.15)
Race						
White	0.88	0.85	0.94	0.91	0.92	0.75
	(0.004)	(0.01)	(0.01)*	(0.02)*	(0.01)*	(0.02)
Non-White	0.12	0.15	0.06	0.09	0.08	0.25
	(0.004)	(0.01)	(0.01)*	(0.02)*	(0.01)*	(0.02)
Male	0.49	0.49	0.46	0.46	0.53	0.68
	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)	(0.03)
Married	0.40	0.44	0.38	0.30	0.33	0.004
	(0.01)	(0.01)	(0.02)*	(0.04)*	(0.02)*	(0.002)
Family Income of Child	38255	38967	39246	31131	37344	83116
	(528)	(644)	(1367)	(2557)*	(1340)	(4554)
Distance	166.65	2.38	23.38	71.04	780.14	0
	(8.65)	(0.06)	(0.48)	(1.10)	(33.46)	
Year	1987	1986	1989	1988	1988	1995
Family Income of Mother	94106	86258	101706	107192	107515	83007
	(1721)	(1596)	(3697)*	(15031)	(5452)*	(4548)
Education of Mother						
< HS	0.14	0.17	0.09	0.10	0.09	0.29
	(0.01)	(0.01)	(0.01)*	(0.02)*	(0.01)*	(0.09)
HS Grad	0.39	0.44	0.34	0.26	0.31	0.32
	(0.01)	(0.01)	(0.02)*	(0.03)*	(0.02)*	(0.11)
Some College	0.24	0.22	0.28	0.29	0.25	0.25
	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)	(0.10)
College Grad	0.24	0.17	0.29	0.34	0.36	0.14
	(0.01)	(0.01)	(0.02)*	(0.04)*	(0.02)*	(0.08)
Education of Father						
< HS	0.22	0.27	0.17	0.20	0.15	0.39
	(0.01)	(0.01)	(0.02)*	(0.03)	(0.01)*	(0.11)
HS Grad	0.33	0.36	0.32	0.33	0.28	0.29
	(0.01)	(0.01)	(0.02)	(0.04)	(0.02)*	0.11)
Some College	0.29	0.18	0.20	0.16	0.23	0.22
	(0.01)	(0.01)	(0.02)	(0.03)	(0.02)*	(0.09)
College Grad	0.25	0.20	0.32	0.31	0.34	0.10
	(0.01)	(0.01)	(0.02)*	(0.04)*	(0.02)*	(0.07)
Only Child	0.04	0.57	0.17	0.05	0.21	0.04
First Born (has sibs)	0.30	0.56	0.17	0.04	0.22	0.22
Youngest Child (has sibs)	0.32	0.55	0.17	0.06	0.23	0.48
N	5184	3375	729	210	870	481

Notes: Weighted by 1968 family weight, * indicates different from <10 miles at 5% significance level.

Table 2. Tobit and Linear Probability Model of Distance at Time of Leaving Home

	Distance (Miles)	Lives > 100 Miles
Mean Dependent Variable	137.78	0.17
(s.e.)	(6.35)	(0.005)
Years of Schooling of Child	24.556	0.016
	(3.587)***	(0.003)***
Male	-7.587	0.024
	(14.687)	(0.011)**
Married	9.077	-0.027
	(16.432)	(0.011)**
Only Child	6.888	-0.013
	(46.062)	(0.032)
Oldest Child	19.769	0.019
	(17.842)	(0.013)
Youngest Child	46.906	0.033
	(18.428)**	(0.013)***
Number of Siblings	6.117	0.004
	(3.777)	(0.003)
Non-White	-73.144	-0.076
	(20.846)***	(0.014)***
Log Income of Mother	6.832	0.000
	(9.029)	(0.006)
R^2	0.002	0.03
N	5184	5184

Notes: Standard errors clustered at family level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3a. Distance Category at Time of Leaving Home and Age 35

	Distance at Time of Leaving Home			
Distance category at 35	<10 miles	11-50 miles	51-100 miles	Over 100 Miles
Co-resident	1.57	0.43	0	0.13
<10 miles	37.97	5.13	1.23	5.28
11-50 miles	8.37	7.21	0.61	2.29
51-100 miles	2.84	0.59	1.78	1.12
Over 100 Miles	7.85	3.56	1.26	10.79

Notes: Weighted by 1968 family weight

Table 3b. Distance Category at Time of Leaving Home and Age 45

	Distance at Time of Leaving Home			
Distance category at 45	<10 miles	11-50 miles	51-100 miles	Over 100 Miles
Co-resident	1.70	0.14	0	0.14
<10 miles	34.38	6.21	1.34	5.92
11-50 miles	10.27	6.26	0.47	2.24
51-100 miles	2.68	0.5	1.25	0.94
Over 100 Miles	9.14	4.47	1.31	10.6

Notes: Weighted by 1968 family weight

Table 4. Tobit and Linear Probability Model of Distance at Age 35

	Distance at 35 (Miles)	Lives > 100 Miles at 35
Mean Dependent Variable	159.66	0.19
(s.e.)	(9.27)	(0.01)
Splitoff Distance > 100 miles	310.616	0.390
	(44.655)***	(0.025)***
Years of Schooling of Child	23.569	0.012
	(5.027)***	(0.004)***
Male	-26.031	-0.004
	(20.822)	(0.014)
Married	148.633	0.068
	(27.618)***	(0.015)***
Only Child	-1.812	-0.003
	(60.493)	(0.042)
Oldest Child	33.199	0.008
	(30.324)	(0.019)
Youngest Child	-27.829	0.007
	(28.104)	(0.018)
Number of Siblings	3.925	0.003
	(4.579)	(0.004)
Non-White	-78.329	-0.050
	(25.974)***	(0.018)***
Log Income of Mother	4.484	0.002
	(6.643)	(0.005)
R^2		0.17
N	2794	2794

Notes: Standard errors clustered at family level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. Tobit and Linear Probability Model of Tuition and Distance at Time of Leaving Home

Mean Dependent Variable (s.e.)	Distance (Miles) 137.78 (6.35)		Lives > 100 Miles 0.17 (0.005)	
Tuition Ratio at Age 18 (In-State/Average Out-of-State)	80.280 (53.198)+	116.798 (63.099)*	0.089 (0.048)*	0.086 (0.052)*
In State Tuition at Age 18 ($1000s)		-2.198 (6.741)		0.011 (0.005)**
Years of Schooling	22.667 (3.531)***	22.079 (3.507)***	0.015 (0.003)***	0.015 (0.003)***
Male	-1.917 (15.072)	-2.097 (14.978)	0.024 (0.010)**	0.026 (0.011)**
Married	18.079 (17.079)	19.702 (17.043)	-0.031 (0.011)***	-0.027 (0.011)***
Only Child	-7.560 (43.989)	-7.037 (42.255)	-0.005 (0.032)	-0.008 (0.032)
Oldest Child	18.894 (19.418)	21.655 (19.589)	0.018 (0.014)	0.017 (0.014)
Youngest Child	46.135 (19.393)**	46.843 (19.555)**	0.030 (0.014)**	0.029 (0.014)**
Number of Siblings	6.089 (4.021)	6.455 (4.067)	0.004 (0.002)	0.004 (0.002)
Non-White	-62.091 (22.204)***	-63.963 (22.216)***	-0.074 (0.015)***	-0.072 (0.014)***
Log Income of Mother	3.389 (9.009)	4.146 (9.051)	0.003 (0.006)	0.004 (0.005)
R^2 N	0.003 5184	0.003 5184	0.05 5184	0.06 5184

Notes: State and year fixed effects included. Standard errors clustered at state/year level. Without state/year clusters the tuition ratio is significant at 10 percent in model (1) and 1 percent in model (2). + significant at 13% * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Linear Probability Models of Distance and Anticipated Caregiving

Mean Dependent Variable *(s.e.)*	Plans to Care for a Parent 0.59 (0.01)		
	Linear Probability Model		Linear Probability Model with IV for Distance
	(1)	(2)	(3)
Lives > 100 Miles Currently		-0.200 (0.034)***	-0.168 (0.108)
Years of Schooling	-0.014 (0.007)**	-0.008 (0.007)	-0.009 (0.007)
Male	-0.070 (0.026)***	-0.072 (0.026)***	-0.074 (0.026)***
Married	-0.088 (0.028)***	-0.074 (0.029)**	-0.075 (0.029)***
Only Child	0.083 (0.072)	0.066 (0.071)	0.067 (0.072)
Oldest Child	0.013 (0.034)	0.025 (0.035)	0.025 (0.034)
Youngest Child	0.033 (0.034)	0.045 (0.034)	0.044 (0.033)
Number of Siblings	-0.002 (0.006)	0.000 (0.006)	0.000 (0.007)
Non-White	0.164 (0.034)***	0.134 (0.033)***	0.138 (0.035)***
Log Income of Mother	-0.025 (0.011)**	-0.027 (0.012)**	-0.027 (0.012)**
R^2	0.07	0.10	0.09
N	1347	1347	1347

Notes: Fixed effects for state of residence and the year when the individual turned 18 included. * significant at 10%; ** significant at 5%; *** significant at 1%

Appendix

Figure 1A. Median and Mean Distance to Mother by Age of Child (Miles)