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Sabino Kornrich, Juan March Institute
Anna Lunn, Stanford University

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Necessary Reductions or Increased Support? Parental Investments in Children during the Great Recession

Sabino Kornrich
Juan March Institute

Anna Lunn
Stanford University

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Abstract: *A central concern for scholars of inequality is understanding how economic shifts influence the intergenerational transmission of advantage and disadvantage. In this article, we examine the impact of one such event – the Great Recession of the late 2000s – on one potential mechanism of transmission: parents' financial investments in children. Because parents at different points in the income distribution have different resources, they may make different decisions or have different abilities to respond to times of economic hardship and uncertainty. We find that during the Great Recession, parents were less likely to spend on child care and spent less on enrichment goods and services for the home, regardless of their position in the income distribution. For education, however, we find that low-income parents were less likely to spend and that those who did spend spent less than before the recession began. High-income parents were equally likely to spend after the onset of the recession and spent even larger amounts than before.*

The Great Recession has played a central role in structuring the political and economic landscape in the United States at the beginning of the twenty-first century (Grusky, Western, and Wimer 2011). Some of the economic consequences were immediately apparent, in the form of reduced incomes, increased unemployment, and lost wealth, with many of the consequences striking those who were already worst off, resulting in increases in inequality (Rugh and Massey 2010; Hout, Levanon, and Cumberworth 2011; Engemann and Wall 2010; Smeeding et al. 2011). However, it is unclear whether the Great Recession might increase or reduce existing inequalities over the long term.

In considering levels of future inequality, the distribution of human capital among those in the labor market will share a central role with the structure of the economy. While human capital comes from many sources, in this paper, we are primarily concerned with parents' monetary investment – their spending. Through spending, parents can provide high-quality child care, improve home environments, and gain access to higher education. Monetary investments provide at least one plausible explanation for how high-earning parents can pass advantages on to their children (cf. Kornrich and Furstenberg 2013; Lefgren, Lindquist, and Sims 2012). If this is the case, then increases in contemporary inequality would be mirrored by larger increases in future inequality, as higher-income parents make larger investments in their children.

As an event, the Great Recession has tremendous potential to structure future inequality through parents' investments in children. The duration of high unemployment (over 9%) was higher than at any other point in the post-war period. Incomes declined and poverty rates increased, suggesting little room for discretionary spending for many households. Indeed, existing research finds that households cut back on household spending, as consumer spending dropped rapidly from 2007 to 2009 (Petev, Pistaferri, and Eksten 2011). Given cutbacks in other

areas, parents' spending on children might decrease as well. Parental transfers to young adult children dropped slightly with the onset of the recession, though the effect disappears in multivariate models, suggesting that changes in household characteristics during the recession might moderate the effect of the recession (Wightman and Schoeni 2012).

However, while income reductions may lead parents to cut back on spending on children, parents could maintain spending despite the crisis. Incomes dropped across the income distribution, and wage incomes dropped more quickly at the bottom of the income distribution than at the top (Bohn and Schiff 2011). However, declines in wages were often compensated by increased uptake of government benefits, which could have allowed families to maintain some spending patterns (Thompson and Smeeding 2011). Additionally, many low-income parents spend substantial shares of their incomes on children already, suggesting a "floor" for spending. Parents may view spending on children as one of their most important financial commitments, and cut back in other areas first.

Finally, while incomes declined for households at the top of the income distribution, levels of income remained high and these households likely had substantial financial leeway. Indeed, some high-income parents may even have increased spending. If parents have financial flexibility and young adult children need more assistance because of a difficult labor market, parents could support them directly or assist with expenses for continuing education.

This paper takes up the question of whether monetary investments in children growing up during the Great Recession differ from previous years. Understanding shifts in levels of investment in children is an important undertaking for understanding well-being in future generations and the potential for growth in inequality. We investigate the extent to which parents

spend on their children, examining spending on child care, education, and a range of other goods and services for children, using data from the Consumer Expenditure Survey.

We find that during the Great Recession, families were less likely to spend on childcare and education and that, when they did spend, they spent lower amounts on education and a range of goods for children. However, the effect of the Great Recession on families' education spending depended on family income. Wealthier families were more likely to spend on education during the Great Recession than their less wealthy counterparts, and the effect of the Great Recession on the level of spending for on education was less for wealthier families. These results provide insight into how the Great Recession affected families' financial decisions and allocation of resources and suggest that the Great Recession could have a negative impact on future equality in the US.

Investments in Children

Over the course of the last half-century, parents appear to be more mobilized to invest in their children in order to ensure their success. Parents invest in their children in two main ways: through time and money. Increases in the amount of time spent with children have been documented in the United States as well as other countries, and more recent research also finds that parents are spending more money on their children in the United States (Bianchi 2000; Kornrich and Furstenberg 2013; Gauthier, Smeeding, and Furstenberg 2004). Increases in inequality may lead parents to invest more because they feel greater pressure to prevent their children from "falling" down the class ladder (Ehrenreich 1990). Regardless of the exact reasons, it appears parents have become more motivated to invest in their children's success, spending

substantial money and time with their children and seeking out structured educational environments for younger children (Lareau 2003).

Today's parents invest most heavily in their children when they are younger than age six, as the cost of child care – particularly high quality child care – has increased and parents are more likely to send children to structured child care, and after the age of eighteen, as parents support children for longer as they attend college. Outside of these ages, parents' expenditures have declined slightly over time, as parents of children in these ages spend most on goods like clothing, toys, sports equipment, and games, and spending on these goods has declined (Kornrich and Furstenberg 2013). Of course, consumer goods have become less expensive over time as the cost of manufacturing decreases and more goods are imported from lower-cost areas.

Whether and how parents' monetary investments have the effects they hope for is not entirely clear. There is some evidence to suggest that high-quality child care can have long-term benefits for children, particularly younger children from poorer families, though effects are small (Belsky et al. 2007; Bradley and Vandell 2007; Vandell and Wolfe 2000; NICHD ECCRN and Duncan 2003; Ramey et al. 2000). For young adult children, parental support is important for attending college and the type of college attended. Parental income is associated with parental willingness to pay for college, the selectivity of institutions attended, and the probability of enrollment in a four-year college (Steelman and Powell 1991; Davies and Guppy 1997; Sandefur, Meier, and Campbell 2006). Certainly, studies dating from the 1970s have documented the positive economic returns to individual investments in education, especially post-secondary education, in the US and around the world (Harmon, Oosterbeek and Walker 2003). More recent studies have shown that the economic advantages from education have persisted through the Great Recession (Red Bird, Rodriguez, Wimer, and Grusky 2012). However, Hamilton (2013)

finds that children with parental support have lower GPAs, although they are more likely to graduate.

In addition to examining spending on education and child care, we also examine spending on a range of material goods in the home which are more likely viewed as more discretionary and less directly linked to children's outcomes by parents than education and child care. We do so in part because they represent an additional category of child-specific spending we can use as a comparison to spending on child care and education. We expect that patterns of expenditure during the recession – whether parents cut back or maintain spending – will differ based on which set of expenditures is in question, but also on parents' position in the income distribution.

Parents' position in the income distribution is related to spending on children largely because of differences in available income. High-income parents increased spending more rapidly than those at other points in the income distribution, and have done so largely because of rapidly expanding incomes. Yet poorer parents appear to try to keep up, as the share of income they devote to spending on children is higher than for higher-income groups and spending on children has not declined despite declines in earnings over the long run. The effect of a recession – and even specific within-family job loss – should depend on the family's position in the income distribution. Families at the top of the income distribution may be largely immune to shocks to their incomes, even though they may lose larger dollar amounts with the onset of a recession. On the other hand, families at the middle and bottom of the income distribution may find that they have little room to spare, and that they must reduce spending on children even though they may prioritize spending.

The nature of the good should also influence parental decisions. For child care, we expect that spending will decline as parents lose income and lose jobs. To the extent that parents turn to

paid child care as an option for their children while they are working, job loss would lead to cut-backs in spending on child care. On the other hand, many parents are committed to child care for reasons beyond simply a space for their children while they are at work, such as the possibility for children to learn skills they are not exposed to in the home or to socialize with other children.

Spending on toys, clothes, and other goods is likely the most discretionary of the goods we examine, and we expect that spending will be more likely to decline during the recession. While the richness of the home environment is important for development, we suspect that parents view spending on most of these goods as discretionary. Thus, we expect that parents who face job loss or the risk of job or income loss will use goods to make cut-backs.

Spending on education is more complicated because it encompasses primary, secondary, and higher education, which have important differences between them. While the quality of public education is highly variable, particularly in urban areas with high levels of inequality like Chicago (Kozol 1992), there is nearly always a publicly-provided (free) alternative to private education for primary and secondary education, which is not the case for post-secondary education. In addition, post-secondary education can serve as an important alternative to work, and has been more important over time in this nature. While many students in higher education also work, they typically wait to begin their full careers until after the completion of higher education. Difficult economic times may mean that older children will be more likely to return to the educational system to wait out bad economic times. Again, the effects of recession may vary substantially depending on a family's position in the income distribution. Higher-income families may have more leeway to support a child's return to school, while for lower-income families in greater economic distress, it is possible that children will feel greater pressure to leave school and work in order to help support families.

Background: The Recession

The recession between December 2007 and June 2009, often referred to as the Great Recession, was the result of a range of factors including a bubble in housing values, the expansion of risky lending, and the creation of derivative products which often obscured the risks inherent in these loans (Glaeser, Gottlieb, and Gyourko 2010). Regardless of the exact causes, it was the most severe recession since the Great Depression in the 1930s and led to lower income, employment rates, and consumer spending.

At the household level, there are several different mechanisms through which the recession could change household spending patterns. First, to the extent that households experience income losses through job loss or fewer hours, they should cut back on spending. Whether they do so for specific items depends largely on how they view those items. Generally, families who experience job loss or other financial troubles cut back on items they consider luxuries first, maintaining spending on items they perceive as necessary even when doing so may cause more financial difficulty in the future (Sullivan, Warren, and Westbrook 2000; Warren and Tyagi 2003).

A second possibility is that households cut back even without experiencing losses themselves. Consumers seem to be aware of future risks, as surveys of consumers find that they often anticipate changes in unemployment rates, interest rates, and inflation (Curtin 1982, Dominitz and Manski 2004). Thus, consumers may cut back in anticipation of more difficult economic times. Alternatively, households may cut back in part to match the consumption behavior of those around them. Reference groups are important for how individuals spend, and if

other households are worse off, it may lead individuals to cut back even though their economic circumstances are unchanged (Duesenberry 1949; Charles, Hurst, and Roussanov 2009).

Data and Sample

Using the 2005-10 Consumer Expenditure Survey (CES), we examine parental investments in children just prior to and during the Great Recession. The CES is a household survey administered by the Bureau of Labor Statistics and is one of the most comprehensive and nationally representative data sources on spending in the US. In addition to an initial interview, each household is interviewed every three months over 4 quarters. Because our interest is in expenditures on children, we restrict the sample to households composed of at least one adult between 25-65 years old and one child or young adult between 0-24 years old (22,096 households, 58, 641 household-months).

We use the same approach as Kornrich and Furstenberg (2013) to deal with both missing quarters of data and missing values in the CES. For both the descriptive and multivariate analyses we use data from all quarters that a household is in the data, which has the benefit of preserving cases. While this strategy allows us to use the existing data from panelists who have missing quarters of data, missing values for total income exist within observations. To deal with these missing values of total income, we use multiple imputation using the MI IMPUTE procedure in STATA. This process creates multiple data sets and replaces the missing values, in this case total income, with simulated values created based on the associations between variables without missing data and the non-missing data in the data set. In observations with missing values for total income, families still reported parents' education, weeks, and hours worked, so we use these variables, in addition to husbands' and wives' ages, the total number of children in

the family and total household expenditures to impute missing values for individual earnings using chained equations. We perform imputations of female and male income separately and then sum the imputed individual earnings if there are two parents in the household.

The multiple imputations procedure then estimates the parameters of the model using each of the simulated data sets and adjusts the estimates and standard errors of parameters to reflect the additional uncertainty induced by the missing values in the data. For more information on multiple imputation, see Allison (2001) and Rubin (1987).

Measures

Spending Measures

We examine three categories of spending: childcare, education, and other miscellaneous goods and services for children. We follow the coding scheme of Kornrich and Furstenberg (2013), who describe the items included in each category in detail, as well as the strengths and weaknesses of these measures. Briefly, child care includes spending on day care and babysitting. Educational spending is the total that families spend on education tuition, but we do not observe who benefits from this education. Therefore, this category may overstate spending on child education by including spending on tuition for parents. Finally, child expenses included spending on clothing for children under 15, books, toys, games, bicycles and tricycles among other miscellaneous goods and repair services for these goods.

We use the Consumer Price Index Research Series (CPI-U-RS) to adjust expenditures to 2008 dollars (Sahr 2009).[1] While we use quarterly reports, we multiply the amount spent by four in order to generate estimates comparable with existing estimates of annual spending. In order to

[1] The CPI-U-RS is a new CPI series incorporating methodological improvements, such as the use of rental equivalence for homeowner costs and quality adjustments for prices (Stewart and Reed 1999).

compare households with different numbers of children, we use a per child measure. Another way to deal with household size would be to use equivalence scales, which take into account economies of scale. However, economies of scale should be small for these spending categories, so we use the per child measure.

Independent Variables

We are most interested in changes in family investments in children after the onset of the Great Recession. We define the beginning of the Great Recession as December 2007, which is consistent with the definitions of both the National Bureau of Economic Research (NBER) and the Bureau of Labor Statistics (BLS). While the recession officially ended in June 2009 as measured by economic growth rates, we consider the entire period in our data set – through the end of 2010 – as part of the recessionary period, due to continuing high unemployment and low economic growth rates. We measure the effects of the Great Recession using a dichotomous variable =1 if the observation is made during or after December 2007.[2]

During the recession spending might decline as a response to declines in income or general economic uncertainty. We measure income with the before tax total income reported for the past 12 months, which includes earned income, welfare benefits, unemployment benefits, alimony, food stamps, social security and retirement income, etc. Missing values are imputed in the process described in the previous section.

We control for other variables that affect parental spending on children. Specifically, we control for the ages of the children in the household, parents' education, family structure and

[2] Because spending on children's goods – and particularly child care and education – demonstrates substantial seasonality, we were concerned that seasonality could influence our findings. In additional models (available on request from the authors) we included dummies for seasons. While these variables were significant in a range of models, they did not change the direction, significance, or magnitude of the income or recession coefficients.

economic contributions of the female head of household. The Great Recession affected unemployment rates of men differently than women, so the economic contributions of women to their families might have changed during the recession.

The ages of the children in the household are included using a series of dichotomous variables that indicate whether there is a child present in the following age ranges: 1-2 years old, 3-5 years old, 6-17 years old and 18-24 years old. We create a series of mutually exclusive variables to measure the effects of different combinations of children's ages on spending. We restrict the sample to families that have children age 5 or younger when we estimate the probability and level of spending on child care because this is the subsample that we think are most in need of and most likely to purchase child care. We expect that the presence of younger children will increase spending on child expenses, while the presence of older children, especially those 18-24, will increase spending on education since those children are of college age.

We used several dichotomous variables for the highest level of education attained by the better-educated parent. The reference category is parents who did not graduate from high school. We predict that more educated parents will spend more on education. We also include a set of dichotomous variables to reflect the type of family. The reference category is families headed by both a mother and a father. We also include dichotomous variables for whether the family is headed by a single mother, a single father or does not fall into one of the other categories.

Finally, we include variables to measure wives' economic contributions. Women's work and earnings are important for spending on children for several reasons. First, wives' participation in paid work may mean that two parents work rather than one, necessitating some type of care arrangement. Second, women may simply be more likely to spend on children using

"their" income: when control of a benefit for children shifted from fathers to mothers in the United Kingdom, spending on children increased while spending for adult goods declined (Lundberg et al. 1997). We use dichotomous variables that are equal to one if the female adult works full-time, if the female adult works part-time and if the female adult is the only income earner in the household. Additionally, we control for the percentage of earned income contributed by the female adult.[3]

Descriptive Statistics

Table 1 shows the sample summary statistics of the non-imputed data before and during/after the Great Recession. Unsurprisingly, we observe a statistically significant decrease in mean income in our sample after the onset of the Great Recession. It is important to note that the sample is not composed of the same families over time, so the families in our sample during the Great Recession have lower incomes than those in the sample prior to the downturn. We observe a number of small differences between families before and after the onset of the Great Recession. Single fathers and two-parent households are more common in the sample during and after the economic decline. Although households in which the female is the only income earner are more common in the sample during and after the recession, we observe more households with female part-time and full-time workers prior to the recession. Moreover, the share of female earned income increases in our sample during the Great Recession compared to before.

[Table 1 About Here]

[3] Computed as female income/(female + male income). Note that this is a percentage of earned income only, while the income covariate that we include includes other forms of unearned income.

We then examine family spending by income quartile before and during the economic downturn, as shown in Table 2. For most types of spending, there are few significant changes, although there are small declines in the third income quartile in spending on child expenses. The largest substantive findings occur, however, at the top of the income distribution. Although high-income parents reduced spending on child expenses slightly, they increased spending on education by an average of roughly $1000 per year, a striking finding given that the amount of the increase is the total amount spent on education among those in the bottom quartile of earners. This increase suggests that while many families were cutting back, families that could afford to do so were investing more in their children during this time of economic hardship. We examine this further with regression analysis.

[Table 2 About Here]

Methods

Our multivariate analysis examines whether spending in each category increased or decreased with the onset of the Great Recession, controlling for a range of household characteristics. We used clustered standard errors at the household level to account for the fact that observations are not independent (i.e. the same household is present in the data multiple times).

We separately model the process which leads to spending and the amount spent given spending because, in many cases, spending in each of the categories that we consider is zero. For child expenses, in 20,053 of 58,375 observations, or 34%, the family spends zero. In terms of

childcare, 13,749 of 22,009 observations of 62% of families with children five or under spend zero on childcare. Out of the 58,375 observations in the data set, 31,443 or 53% spend zero on education. The high number of zeroes in the data set suggests the need to model not just the total spending amount but the probability that a family spends zero in each category. Therefore, we use Zero Inflated Negative Binomial (ZINB) models to account for the possibility that individuals do not spend any money in the specified category experience a different process than those that take on non-zero values.

These ZINB model uses a two stage process to estimate the effect of the explanatory variables and covariates on the outcome of interest – different types of spending. First, the model fits a logit model to estimate the logged odds that a particular unit will have an outcome equal to zero (i.e. spend nothing in a particular category). The first stage model allows us examine the factors that contribute to a family's likelihood of spending on a category. Understand the factors that influence whether a family allocates any part of their budget to different spending categories is substantively interesting, and this model also allows us to determine the subsample for which we should model the level of spending. To analyze the factors that contribute to how much a unit spends in each category, the model ZINB uses a Negative Binomial Regression Model (NBRM) in the second stage to estimate how much a family spends in a particular category conditional on the observation that the unit spends an amount greater than zero. Restricting the sample for the second model to units in which the outcome is greater than zero reduces the influence of observations that experience a different structural process in determining their level of outcome. We think that the process that determines whether a family spends zero or a different amount on a good or service may be different from the processes that determines how much a family then spends on that good or service, and the ZINB model allows us to model this.

Similar to the Poisson model, Negative Binomial models are used for modeling data in which the dependent variable takes on values of positive integers. The dependent variables in our models – spending on toys, clothes and other goods, spending on child care and spending on education - take on values that are either zero or positive.[4] However, unlike the Poisson model, the NBRM relaxes that assumption that the mean and variance of the dependent variable are equal. We test this assumption by testing whether the α parameter, which describes the dispersion of the data, is statistically different from 1. We find that in each model, the log(α) is statistically different from 0, which violates the assumptions of the Poisson model and confirms that the NBRM is appropriate for modeling the values in our data in the second stage of the zero inflated process.

The NBRM follows a binomial distribution model and is linked to the linear predictors by a log function. The NBRM model in the second stage model takes the following form:

$P(Y=y_i) = \frac{\Gamma(y_i+\nu_i)}{y!\Gamma(\nu_i)} * \left(\frac{\nu_i}{(\nu_i+u_i)}\right)^{\nu_i} * \left(\frac{u_i}{(\nu_i+u_i)}\right)^{y_i}$ where u_i is the expected value of Y, and ν_i is a parameter that quantifies the over dispersion of *y*. If the outcome is not over dispersed, then ν_i is equal to zero. In this case, the NBRM is the same as the Poisson model. However, the mean and variance of our three dependent variables are not equal, so we use the NBRM model in order to allow for the variance of the outcome to exceed the expected value.

The full ZINB model is as follows:

$$P(Y=y_i) = \begin{cases} p + (1-p)\left(\frac{\nu_i}{(\nu_i+u_i)}\right)^{\nu_i} & , \quad y = 0 \\ (1-p)\ \frac{\Gamma(y_i+\nu_i)}{y!\Gamma(\nu_i)} * \left(\frac{\nu_i}{(\nu_i+u_i)}\right)^{\nu_i} * \left(\frac{u_i}{(\nu_i+u_i)}\right)^{y_i} & , \quad y > 0 \end{cases}$$

[4] In order to check whether our results are robust to the assumptions of the structure of the errors that the NBRM assumes, we also run a two-stage model. We first run a logistic model to predict the log-odds that the dependent variable is equal to zero. We then run an OLS model conditional on spending being greater than zero in which the dependent variable is the log of spending. The results are virtually identical because as the potential values of the dependent variable increase the NB distribution approaches that of the normal distribution.

We run models for each outcome or spending category. For the regression on childcare, we restrict the sample to families who have at least one child under the age of 6.

Results

We begin by examining results from multivariate negative binomial models for each type of child investment. Our main question of interest is whether there is a difference between households' spending before and after the onset of the Great Recession. However, because the models are nonlinear and because they contain interaction terms, preventing easy interpretation, we instead show predicted values and turn to the primary regression tables later in the text. Each set of predicted values below is generated for families by setting households to have a college education, live in a two-parent family, and have a part-time female worker who earns 50% of household income. We select these values because they represent modal categories for several of the variables. Using different values would primarily shift predicted values up or down, but the gap between families before and after the recession may appear smaller or larger depending on other values chosen. Nonetheless, the significance of differences remains the same. We present the predicted values for incomes ranging from $20,000/year, which is around the 10^{th} percentile of income in our sample, to $170,000/year, which is between the 90^{th} and 95^{th} percentile.

Figure 1 shows predicted values for parental spending on child goods and other home-based enrichment expenditures among households with children between the ages of 6 and 17. The upper panel shows the probability of spending zero by income before and after the onset of the recession. As the figure suggests, there is practically no difference between these values, and, indeed, the regression coefficient for this portion of the model fails to reach statistical significance. For the amount spent, however, there is a significant (though small) negative effect

of the Great Recession on parental spending, as parents spend slightly over 7% less after the onset of the Recession. This pattern of spending likely occurs because parents are able to buy small quantities of these goods (and sometimes services) for their children, meaning they are unlikely to cut spending entirely. However, when they do spend, it appears they purchase less or choose less costly versions of these goods to purchase for their children.

[Figure 1 About Here]

Spending on child care, however, shows a pattern which offers a clear contrast to that for spending on goods, as seen in Figure 2. For spending on child care, the probability that parents spend nothing is higher during the recession, although the amount they spend remains roughly constant. Since child care cannot be purchased in small amounts, but parents must commit to a large amount of spending for at least an individual month, it makes sense that the amounts spent remain roughly constant but that parents cut back instead on their willingness to spend. We note that while the cut-back is significant, it is still small, on the order of roughly a three percentage point decline regardless of parents' position in the income distribution. Still, a three percentage point cut-back in the use of child care – among only households with children age 5 or younger – could be seen as substantial, given that this model controls for household income and a range of other characteristics.

[Figure 2 About Here]

Finally, we examine the effects of the recession on parental spending on education across the income distribution. We generate these predicted values for households with children over the age of 18 present (the category of household which engages in the greatest spending). Figure 3 shows that the shift in spending varies with parents' income. For those at the bottom of the income distribution, the likelihood of spending on education and the amount spent declines after the onset of the recession. The predicted decline in spending is large for households with annual incomes of 20,000 dollars: a drop of roughly 500 dollars and a likelihood 3 percent lower that they will engage in any spending. For households with high incomes, however, the effect of the recession is very different. First, there is no decline in the likelihood of any spending on education. Second, the predicted amount spent is *greater* during and after the Great Recession than before. As we note early, we suspect that this reflects parents' greater willingness to help support children through higher education while they delay their entry into the labor market because of difficulty finding employment. While higher spending during the recession occurs only among those at the very top of the income distribution, parents who are at the median or slightly above the median have not cut back on average after the recession, in contrast with poorer parents.

[Figure 3 About Here]

We then turn to the remainder of the regression coefficients, first examining the probability that a household spent any amount during a given three-month span. While our interest is in whether households spend, coefficients are for the likelihood that a household will not spend anything in a given quarter. Thus, positive coefficients represent a greater likelihood of

spending zero, while negative coefficients represent a lower probability of zero spending. For purposes of simplicity in the discussion, we often refer instead to the reciprocal – that is, that positive coefficients represent a lower likelihood of any spending, while negative coefficients represent a higher probability of any spending.

The results in Table 3 largely mirror existing research on spending. Higher income parents are more likely to spend, as are more educated parents, with stronger effects for child care and education than for goods and other enrichment expenses. Unsurprisingly, many of the expenses we examine are very specific to particular ages of children. Those with children between the ages of 6 and 17 are likely to spend on education, perhaps as a result of small but routine expenditures on books and other goods for schools (as the following table shows, the amounts parents of children in this age group are relatively low). The presence of older children in the home is associated with lower spending on a range of investment items and child care, perhaps in the former case as parents choose to give them money directly (an expense we do not observe), while in the latter case, they may help to care for children. The effects of family structure and wives' labor force participation and income are somewhat more complex. Single-parent families are more likely to spend on child care, likely out of need, but less likely to spend on other investments, probably due to a general constraint on resources. In two-parent families, wives' participation in full- or part-time work increases the likelihood of child care, and part-time work increases the likelihood of spending on education and spending on a range of goods. Wives' share of income also increases the likelihood of spending on all categories of goods.

[Table 3 About Here]

Next, we turn to the link between covariates and the predicted amount spent, given that households engaged in any spending. These coefficients are shown in Table 4. The presence of older children in a family decreases spending levels on education and childcare relative to only having young children. The effects of different age groups on educational spending are less clear, but only having children over 18 increases spending on education relative to families that only have children under 5. Given the large costs of college, this is expected.

[Table 4 About Here]

Single parents spend more on child care relative to two parent households, but the effect of single parent vs. dual parent families on spending on child goods and education varies by the gender of the parents. We also see that families in which the mother works spend more on childcare, but female labor force participation does not change spending on child expenses. Both family structure and female labor force participation show that spending on childcare is related to the necessity for child supervision while the parents work. The effect of female labor force participation on spending on education is mixed. When the mother works full-time as opposed to not working, this also increases spending on education, but as the percentage of earned income that the female contributes increases, so does spending on education.

Conclusion

The Great Recession had a large impact on employment levels, incomes, and families' net wealth, but the effects also extend to families' decisions to spend on key goods and services for their children. These changes in budget allocations not only affect the environment that

children are raised in, but changing investments in children's human capital may also translate into increasing future inequality as the children of the Great Recession enter the labor force.

Our analysis shows that changes in spending on children were not uniform across goods. Specifically, we see that families are more likely to eliminate spending on childcare are opposed to goods for children. This could be that parents suffer unemployment during the recession, but are able to save on childcare as they take care of their children in the home. For other families, childcare may be used at times other than when the parents are at work, so the elimination of spending on childcare may not reflect an increasing joblessness but a general budget contraction. The families that still spend on childcare after the recession do not change the amount that they pay. While the Great Recession does not significantly affect whether or not families spend on child expenses, it does decrease the amount that they spend. Given the different price levels and quantities of books, toys and games, families had more flexibility in reducing the amount that they spent on these goods and services without completely eliminating them from their budget.

Understanding changing investments in education during the Great Recession is important for understanding future stocks of human capital and job market opportunities for children that were raised during the Great Recession. Our results show that the effects of the recession varied by household income. While lower income families were more likely to eliminate spending on education during the Great Recession, the economic downturn did not change the already higher probability that upper-income families would spend on education. Additionally, while lower-income families decreased the amount that they spent on education during the recession, upper-income families actually *increased* this spending. These results demonstrate a widening gap in both the rate and level of investment in education between rich and poor families during this recent economic recession. Given the importance of education for

future income, we expect that the difference in investments in education by income level during the recession will increase future income inequality and decrease intergenerational income mobility.

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Table 1. Summary Statistics by Time Period

	Before			During/After Recession			
	N	Mean	SD	N	Mean	SD	
Income in $10,000 2008 USD	15772	8.04	7.22	24873	7.78	7.05	***
Age of Children in household							
All Children between 0-5	28918	.15		29723	.15		
All Children between 6-17	28918	.39		29723	.37		***
All Children over 18	28918	.13		29723	.14		*
Children under 5 & 6-17	28918	.18		29723	.17		
Children under 5 & over 18	28918	.02		29723	.02		
Children 6-17 & over 18	28918	.10		29723	.11		**
Children in all 3 categories	28918	.02		29723	.03		*
Highest Level of Parental Education							
High School Graduate	28918	.26		29723	.25		**
Non-high School Graduate	28918	.15		29723	.15		
Some College	28918	.30		29723	.29		
College Graduate	28918	.29		29723	.30		***
Family Structure							
Husband & Wife	28918	.71		29723	.70		*
Single Mother	28918	.13		29723	.13		
Single Father	28918	.02		29723	.02		*
Unclassified	28918	.15		29723	.15		***
Female Labor Force Participation							
Sole Wage Earner	28918	.03		29723	.03		***
Part-time Job	28918	.25		29723	.23		
Full-time Job	28918	.24		29723	.23		***
Percentage of earned income from wife	18759	.30		19226	.31		

*p <.05, **p <.01, ***p < .001 (two-tailed test t-test)
Notes: Non-imputed data
Data Source: 2006-10 Consumer Expenditure Survey

Table 2. Summary Statistics of Spending by Time Period and Income Quartile

	Before			During/After Recession				
	N	mean	SD	N	mean	SD		
1st Income Quartile							Difference	
Child Expenses	3715	336.68	592.48	6442	335.73	560.20	-0.94	
Childcare (Families w/ children 0-5)	1508	363.97	1208.92	2743	345.06	1086.27	-18.91	
Education	3715	376.83	2112.20	6442	371.41	2308.91	-5.42	
2nd Income Quartile								
Child Expenses	3885	422.16	624.60	6270	404.80	850.74	-17.35	
Childcare (Families w/ children 0-5)	1506	706.56	1731.14	2538	687.56	1663.69	-19.00	
Education	3885	610.09	3577.37	6270	670.11	3056.26	60.02	
3rd Income Quartile								
Child Expenses	4086	545.64	877.61	6083	503.40	768.93	-42.24	*
Childcare (Families w/ children 0-5)	1585	1416.56	2575.98	2304	1485.80	2756.06	69.25	
Education	4086	1160.62	4830.60	6083	1228.74	4768.05	68.13	
4th Income Quartile								
Child Expenses	4086	686.55	1085.69	6078	681.01	1137.66	-5.53	
Childcare (Families w/ children 0-5)	1428	2960.42	4922.13	1990	3102.60	5168.02	142.18	
Education	4086	2583.55	7842.21	6078	3578.01	12210.85	994.47	***

*p <.05, **p <.01, ***p < .001 (two-tailed test t-test)
Data Source: 2006-10 Consumer Expenditure Survey

Table 3. Logistic Process in ZINB Models Predicting Probability of Spending>0

		Expenses	Childcare	Education
	Income (in $10,000 2008 USD)	-.050***	-.126***	-.088***
		(.005)	(.012)	(.007)
	Recession	-.014	.103*	.138***
		(.025)	(.043)	(.038)
	Recession*Income			-.009*
				(.004)
	Income^2	.001***	.002***	.001***
		(.0001)	(.0004)	(.0002)
Children's Ages (Reference= Only Children 5 and under)	All Children between 6-17	.966***		-2.057***
		(.043)		(.043)
	All Children over 18	2.888***		-.776***
		(.052)		(.051)
	Children under 5 & 6-17	.171***	.173***	-1.748***
		(.050)	(.047)	(.047)
	Children under 5 & over 18	.361***	.755***	-.367***
		(.094)	(.114)	(.104)
	Children 6-17 & over 18	1.622***		-1.921***
		(.051)		(.052)
	Children in all 3 categories	.390***	1.034***	-1.675***
		(.091)	(.114)	(.085)
Education (Reference= Not High School Graduate)	High School	-.100*	-.258**	-.488 ***
		(.041)	(.082)	(.043)
	Some College	-.283***	-.540***	-.760***
		(.041)	(.081)	(.043)
	College	-.267***	-.861***	-.975***
		(.044)	(.085)	(.047)
Family Structure (Reference= Father and Mother)	Single Mother	.248***	-1.244***	.382***
		(.070)	(.13)	(.070)
	Single Father	.512***	-1.421***	.116
		(.082)	(.214)	(.088)
	Unclassified	.252***	-.584***	.399***
		(.057)	(.109)	(.058)
Female Labor Force Participation	Sole Wage Earner	.408***	-.060	.133
		(.088)	(.175)	(.090)
	Part-time Job	-.115**	-.925***	-.239***
		(.041)	(.067)	(.040)
	Full-time Job	.218***	-.989***	.037
		(.046)	(.08)	(.046)
	Percentage of earned income from wife	-.151**	-.407***	-.144**
		(.053)	(.101)	(.054)
	Constant	-1.308***	2.345***	2.72***
		(.057)	(.092)	(.064)
N		53,704	20,261	53,704

Notes: Coefficients and T-statistics reported, Standard Errors Clustered at Household Level
*p <.05, **p <.01, ***p < .001 (two-tailed test)
Data Source: 2006-10 Consumer Expenditure Survey

Table 4. NB Process in ZINB Models Predicting Spending Conditional on Spending>0

		Expenses	Childcare	Education
	Income (in $10,000 2008 USD)	.045*** (.003)	.064*** (.005)	.075*** (.005)
	Recession	-.076*** (.017)	.026 (.029)	-.151** (.053)
	Recession*Income			.012** (.004)
	Income^2	-.0004*** (.0001)	-.001*** (.0001)	-.001*** (.0001)
Children's Ages (Reference= Only Children 5 and under)	All Children between 6-17	-.256*** (.021)		-.042 (.074)
	All Children over 18	-.486*** (.047)		1.186*** (.082)
	Children under 5 & 6-18	-.474*** (.026)	-.814*** (.031)	-.981*** (.078)
	Children under 5 & over 18	-.723*** (.047)	-.733*** (.076)	-.136 (.212)
	Children 6-17 & over 18	-.950*** (.030)		-.004 (.081)
	Children in all 3 categories	-.999*** (.047)	-1.283*** (.071)	-1.058*** (.132)
Education (Reference= Not High School Graduate)	High School	.109 *** (.025)	.062 (.062)	.376*** (.077)
	Some College	.139*** (.025)	.100 (.061)	.556*** (.073)
	College	.160*** (.031)	.215*** (.064)	1.048*** (.076)
Family Structure (Reference= Father and Mother)	Single Mother	.088† (.050)	.605*** (.096)	-.349*** (.100)
	Single Father	.159*** (.046)	.978*** (.125)	-.032 (.152)
	Unclassified	.087* (.039)	.599*** (.085)	-.375*** (.086)
Female Labor Force Participation	Sole Wage Earner	.021 (.062)	.426*** (.123)	-.077 (.142)
	Part-time Job	-.013 (.028)	.502*** (.063)	-.052 (.058)
	Full-time Job	-.009 (.033)	.775*** (.066)	-.203** (.066)
	Percentage of earned income from wife	.040 (.036)	.239*** (.068)	.172* (.074)
	Constant	6.446*** (.030)	7.021*** (.086)	6.543*** (.100)
N		53,704	20,261	53,704
ln(α)		-.125*** (.011)	-.136*** (.02)	.568*** (.014)

Notes: Coefficients and T-statistics reported, Standard Errors Clustered at Household Level
*p <.05, **p <.01, ***p < .001 (two-tailed test)

Figure 1: The Great Recession and spending on children's goods, by household income

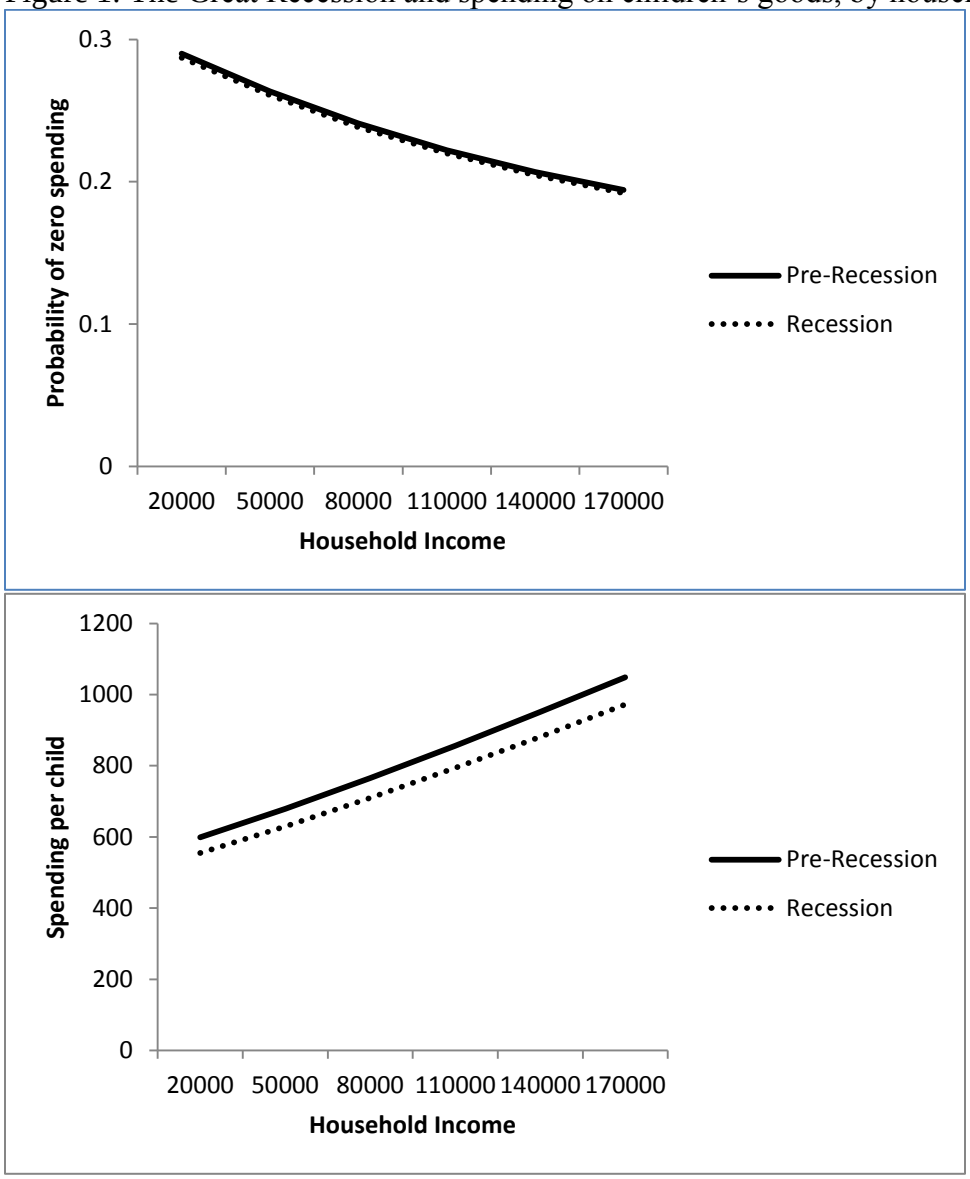

Figure 2: The Great Recession and spending on child care, by household income

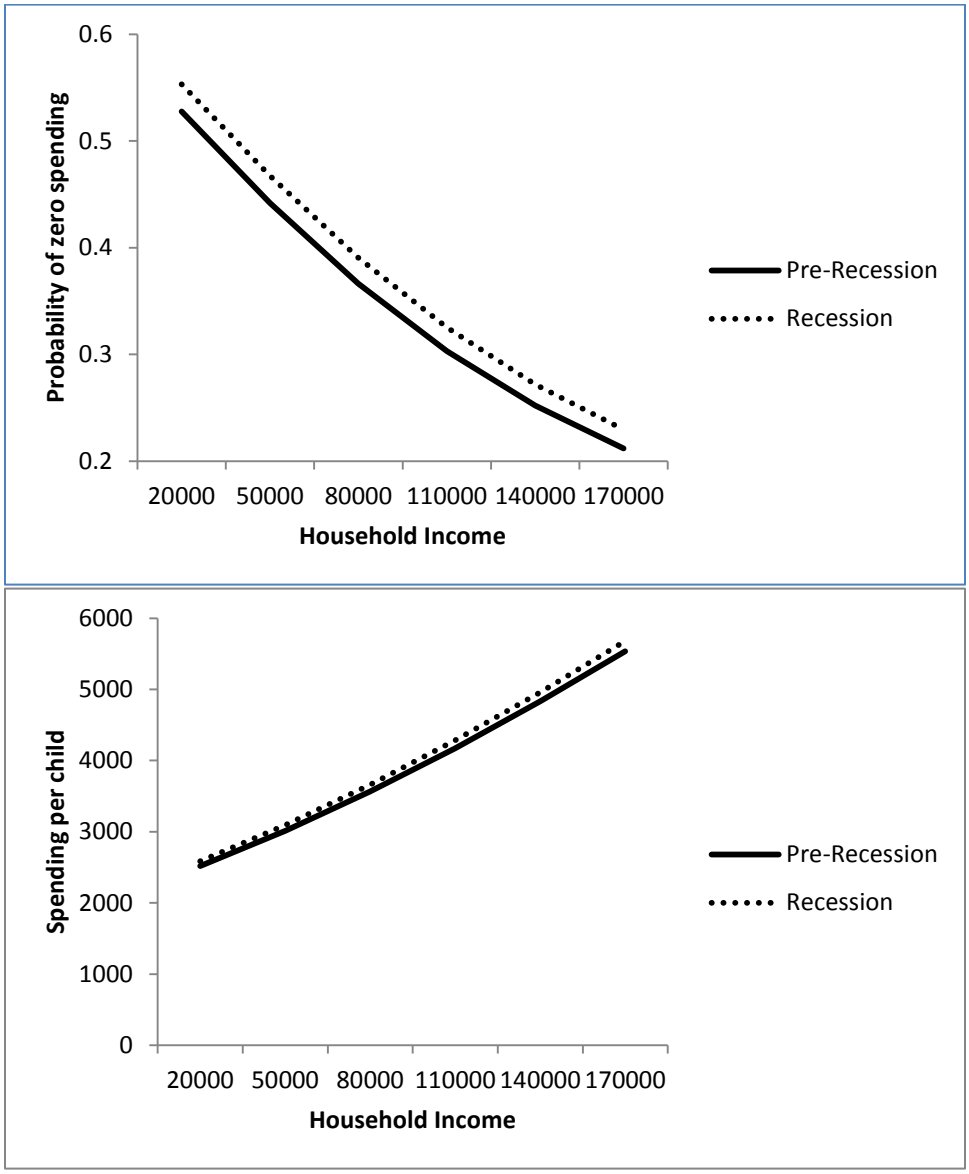

Figure 3: The Great Recession and spending on education, by household income